

## Main topic 2: Engaging people; the wider benefits of conservation and healthy ecosystems

**Session Topic Team: John Pinel (Jersey; Coordinator, and in the Chair); Jake Kuyer (Economics For The Environment Consultancy Ltd); Dr Keith Bensusan (Gibraltar Ornithological & Natural History Society; Question-master); Iain Orr, Dr Mike Pienkowski & Catherine Wensink (Rapporteur) (UKOTCF)**

Introduction	(The numbers before each title below are links to that item.)
2.01	Nature conservation priorities in a changing world (John Pinel, <i>Jersey</i> )
2.02	Natural Capital Accounting: Providing economic evidence for a green recovery (Jake Kuyer, <i>eftec: Economics For The Environment Consultancy Ltd</i> )
2.03	Floras of Gibraltar, old and new: botany and public engagement on The Rock (Keith Bensusan, Leslie Linares, Michael Grech, Charles Perez, Albert Gonzalez & Rhian Guillem, <i>Gibraltar Ornithological &amp; Natural History Society &amp; Gibraltar Botanic Gardens</i> )
2.04	Buy Back Bermuda (Andrew Dobson, <i>for Bermuda Audubon Society &amp; Bermuda National Trust</i> )
2.05	Behaviour Change for Conservation – collective approaches to inspire more people to do something positive for nature (Leigh S. Morris, <i>Manx Wildlife Trust</i> )
2.06	Championing UK’s most special species: the wildlife of the UK Overseas Territories and Crown Dependencies (Lord [John] Randall, <i>UKOTCF &amp; House of Lords</i> )
2.09	Discussion and agreement of conclusions & recommendations
<b>Posters in this session</b>	
2.07P	Learning from networks of wetland educators and NGOs (Connor Walsh, <i>International Engagement Officer, Wildfowl and Wetlands Trust</i> )
2.08P	The Invasive invertebrate Project (Natasha Stevens, Liza Fowler, Daryl Joshua & Christy Jo Scipio-O’Dean, <i>St Helena National Trust</i> )

### Introduction

*Due to technical and other problems, this session started with the programmed third talk, followed by the second and then the first, before working in planned sequence from the fourth (although they are described below in the planned sequence). For the same reasons, Mike Pienkowski chaired the start of the session before handing over to John Pinel after the second presented talk.*

In introducing the session, Mike noted that this topic is concerned with both engaging more people in conservation, and in securing better understanding of the benefits to people of conserving wildlife and native ecosystems – inter-related topics, of course. Education also forms part of this but, quite properly, it occurs in several other topic sessions too.

He noted that the programme started with two wide views from different perspectives, the second bringing in the concept of natural capital accounting. It then turned to the long-term dependence of our subject on people who study for love – the derivation of the now somewhat abused term “amateur”, which is the opposite of “professional” only in that they are unpaid, not in the quality of the work. Then there were two more examples of ways of engaging various forms of public support, one from a UK Overseas Territory and the other from a Crown Dependency – and, finally, a presentation on involving more Parliamentarians and other public figures.

# Nature conservation priorities in a changing world

John Pinel (Jersey)



John Pinel

Pinel, J. 2021. Nature conservation priorities in a changing world. pp 68-74 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

The accelerating pace of climate change and the rate of biodiversity loss are considered to be existential threats to humanity. There is a strong case to be made to re-shape the current paradigm of our economic activity and the nature conservation priorities we pursue in order to halt the biodiversity catastrophe and runaway climate change.

For almost 40 years, since the Rio Convention on the Conservation of Biodiversity was agreed, the world has been battling the dual crisis of climate change and biodiversity loss. Governments have made ongoing and increasingly significant commitments to cut our carbon footprints and to conserve habitats around the globe, in order to protect the rich diversity of our natural world. However:

- Anthropogenic CO<sub>2</sub> emissions have increased steadily leading to the highest atmospheric levels in the last 800,000 years.
- Populations of wildlife have declined by two thirds over the past 50 years.
- Since 1990, it is estimated that 420 million hectares of forest have been lost through conversion to other land uses.

Despite our best efforts, year on year, the earth has been degraded, whilst we aspire to improve it. We need to transition to a sustainable economic system now, while we protect half our planet from further degradation, in order to build societal resilience to the changing climate.

*John Pinel, Freelance Ecologist, Jersey [jeapinel@gmail.com](mailto:jeapinel@gmail.com)*

The topic of this section of the conference is about “Engaging People: The Wider Benefits of Conservation and Healthy Ecosystems.” I am taking a very wide view of nature conservation in this presentation.

For almost 40 years, since the Rio Biodiversity Convention was agreed, the world has been battling the dual crises of climate-change and biodiversity-loss. Governments have made ongoing and increasingly significant commitments to cut our carbon footprints and to conserve habitats and species around the globe, in order to protect the rich diversity of our natural world, but still:

- Populations of wildlife have declined by two thirds over the past 50 years.
- Since 1990, it is estimated that 420 million hectares of forest have been lost through conversion to other land uses.
- Anthropogenic CO<sub>2</sub> emissions have increased steadily leading to the highest atmospheric levels in the last 800,000 years.

Despite our best efforts, year on year, the earth has been degraded whilst we aspire to improve it. We need to transition to a sustainable economic system now, whilst

we protect half our planet from further degradation, in order to build societal resilience to the biodiversity crisis and our changing climate.

Prof John Schellnhuber, one of the world’s leading authorities on climate-change, has said (Breeze 2019) that, if we continue down our present path, “there is a very big risk that we will just end our civilisation. The human species will survive somehow but we will destroy almost everything we have built up over the last two thousand years,” and this message is echoed by the UN, the International Panel on Climate Change, the World Bank, the International Monetary Fund, the World Economic Forum and many other players who are not usually known for their doomsday messages.

Many authorities have suggested that we live in a new geological era, which has been termed the Anthropocene, or, by those with a more gallows humour; the Plasticene – and we do find plastic everywhere, from the high arctic to the abyssal depths, in the stomachs of wildlife and now, as reported earlier this year, even in human placentas (Ragusa 2021)



Photo: [change.org](http://change.org)

Whatever we choose to call it, this period, where man's activities have significantly altered the earth's natural processes, is causing Earth's 6th mass extinction event and estimates suggest that 100s to 1,000s of species are going extinct every year, way above the natural background extinction rate (De Vos 2014)

So what is the problem; what is it which drives the loss of biodiversity on earth? At the highest level there are two main issues:

1. The number of humans on the planet, and
2. The resources that we are using and how we are extracting, producing and disposing of them.

The first problem is easy to solve. As Sir David Attenborough states in the foreword of the recent *Review of the Economics of Biodiversity* (Dasgupta 2021): "Today, we ourselves, together with the livestock we rear for food, constitute 96% of the mass of all mammals on the planet. Only 4% is everything else – from elephants to badgers, from moose to monkeys. And 70% of all birds alive at this moment are poultry".

We now need over 1½ Earths to supply the resources humanity currently demands to maintain our modern, affluent lifestyles, if everyone on earth were to live at the economic level of the average UK citizen, we would need 2½ Earths. Of course, our resource use is not spread evenly across the planet. We are perhaps fortunate that those who live in the most biodiverse parts of the world, also consume the least, and therefore make a smaller



impact on our environment.

According to data from [Resilience.org](http://Resilience.org), Nigeria, with a population of more than 140 million people consumes as much energy every year as the U.S. military ([www.resilience.org](http://www.resilience.org), 2020)

The United Nations ([www.un.org](http://www.un.org), 2020) estimate that the world population stood at 7.6 billion people in 2017 and is predicted to rise to 11 billion by the end of the century. However, in what we call the high income countries, human reproductive rates are falling rapidly.

The BBC ([www.bbc.org.uk](http://www.bbc.org.uk) 2020) reported in 2020 that 23 nations - including Spain and Japan - are expected to see their populations halve by 2100, and they explain why fertility rates are falling. It has nothing to do with sperm counts or the usual things that come to mind when discussing fertility; instead, it is being driven by more women in education and work, as well as greater access to contraception, leading to women choosing to have fewer children.



If we were to demand that education, health care and poverty eradication were extended to everyone on the planet, within a generation, population levels would start to fall.

If your children are starving, you do not have an incentive to deal with biodiversity loss; nothing will stop you killing wildlife or felling trees if that puts food on your table.

So the solution to the population explosion is easy – educate and raise the standard of living for the world's poor.

The second problem is the hardest. We have been aware of the potential impacts of biodiversity loss and climate change for a long time.

In response to dire concerns about wildlife declines, the World Wildlife Fund was set up in 1961 and over the subsequent 60 years has been campaigning tirelessly for nature conservation.

Almost 30 years ago in 1992, 192 Governments of

the world agreed to work together to combat what was recognised even then as the catastrophic loss of biodiversity and to solve what was popularly called global warming through the Convention on Biological Diversity and the UN Framework Convention on Climate Change (UNFCCC).

Since then we have set even more ambitious targets through numerous international agreements. Tens of thousands of organisations world-wide work hard to conserve the Earth’s amazing habitats and species.

Yet, despite all this effort, the World-Wide Fund for Nature/World Wildlife Fund [the name differs in different nations] (WWF) reports that we have lost 68% of the populations of many species on our planet. In the decade since 2011, we have missed reaching any targets set for the UN Decade on Biodiversity. In fact we missed the targets so badly, that this current decade is the UN Decade for Ecosystem Restoration in recognition of the immense harm we have caused to our life-support system.

The United Nations reports ([www.un.org](http://www.un.org), 2019) that 70% of coral reefs are threatened or already gone due to higher water temperatures, ocean acidification and nutrient loading, and pollution.

Global Forest Watch reports that the tropics lost 11.9 million hectares of tree cover in 2019 ([www.globalforestwatch.org](http://www.globalforestwatch.org), 2020), the third-highest amount in any year since the turn of the century.

So why do we continue to destroy our planet whilst we know that by doing so we are threatening the future of humanity?

The publication *Nature*, reported last year (2020) that, in 2019, the world spent between US\$124 and US\$143 billion per year on activities that benefit nature worldwide. But to reverse the decline in biodiversity by 2030, we would need up to US\$967 billion per year. a nature-funding gap as high as US\$824 billion per year.

To reverse the decline in biodiversity, we do need more money to halt the impacts of humanity on the planet, such as in invasive species management and habitat restoration, but more importantly, we need to stop doing the things that destroy biodiversity in the first place. We simply don’t have an economic theory to value nature adequately and, until we do, it should not be priced as a commodity. Its value is beyond calculation.

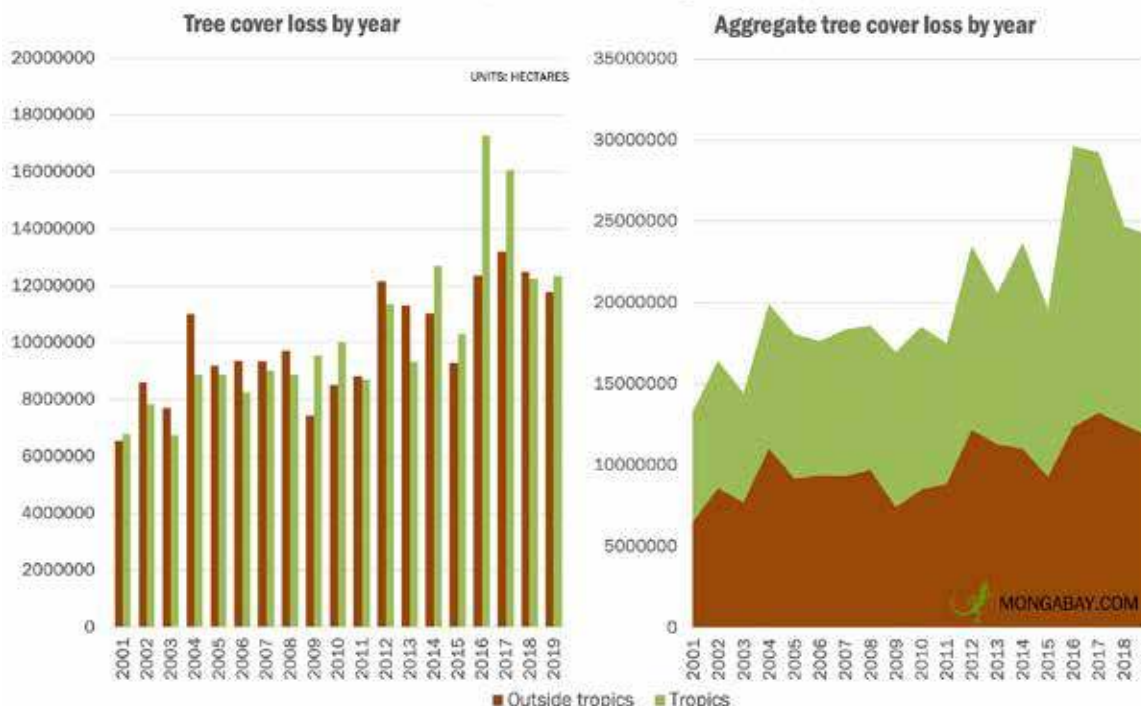
The UK is one of the most nature-depleted countries in the world, ranked 189th out of 218 countries, according to the ‘Local Biodiversity Intactness Index (2020)’ run by the [Predicts project](#).



Little Cayman. Photo: John Pinel

### Annual tree cover loss since 2001

Data source: WRI / Hansen 2020 using 30% canopy cover



The UK Government’s Overseas Territories Biodiversity Strategy ([www.gov.uk](http://www.gov.uk), 2009) recognises that up to 2009, over 340 endemic species have been recorded from the UK Overseas Territories, compared to about 60 in metropolitan UK, whilst a paper by Churchyard *et. al.* (2016) identifies 1,549 endemic

species across the UKOTs or, as the RSPB reported it, ([www.rspb.org.uk](http://www.rspb.org.uk)) the UKOTs hold c. 94% of Britain's endemic species.

The Biodiversity Strategy also states that over £1.5m of Government money was spent on conservation in the UKOT's in 2008/2009, whilst according to the *Independent* newspaper in the UK (Chu 2020), current Covid-19 relief packages are costing £14bn a month.

In October 2020, CBS News (Gandel 2020) reported that Covid-19 will cost the US economy \$13trillion; yet Covid-19 is a mere inconvenience, compared to what will happen to us if biodiversity continues to crumble, and if our climate continues to warm.

In many ways, the biodiversity crisis is the cause of the pandemic, and investing in biodiversity solutions will reduce the risk of future pandemics.

So what is it that we need to do to stop this devastating loss of wildlife?

We know the solutions; we know what drives biodiversity loss, and we know how to change those drivers. We currently have a small window of opportunity to implement those solutions if we want to, before the catastrophe becomes unstoppable.



Image: Joel Pett [climateactionreserve.com](http://climateactionreserve.com)

We are all complicit in this, and small islands are particularly vulnerable; so to start, we need to change our behaviours as individuals, but acting alone will change nothing. So we also need to talk about what we are doing and what needs to be done. We need to campaign and lobby businesses that we use and businesses that we don't use, and tell them why.

If you don't use a product because it is damaging, tell the manufacturer. If you give up something because it harms wildlife, tell your supplier.

We need to normalise positive action, so people don't feel like they are losing out, but feel instead that they are falling behind in the change of attitude which we all need

to make.

It is important to normalise the conversation around the biodiversity and climate catastrophe, by talking about it as often as possible and to talk about the solutions.

We need everyone to engage with what is happening to our planet, make the risks of continuing our current trajectory clear, and that business as usual is not an option.

We need everyone, from children to pensioners, to be knowledgeable and onboard to deal with the systemic change required to address these catastrophes, whilst we continue working to conserve what we have left.



Photo: [rainforesttrust.org](http://rainforesttrust.org)

The easiest, most effective way to slow biodiversity loss and the heating of our atmosphere is simply to stop cutting down primary rainforest.

Planting trees is a great idea, as long as it avoids harming habitats of greater biodiversity value than woodland and forest. However, a tree planted today will not draw down the promised CO<sub>2</sub> or be colonised by associated species for at least 30 years and we don't have that long – and it will make no difference anyway if, at the same time, we continue to fell mature forest and put carbon dioxide into the atmosphere.

Yet we continue to fell forest, year on year, consigning species after species to extinction, and the growing call to move from fossil fuels to bio-fuels will only exacerbate this crisis in our forests as we clear more land for oil based crops.



Photo: [healthyhints.com.au](http://healthyhints.com.au)

We need nature-friendly agricultural systems, working in protected areas which cover half of the planet, empowering indigenous people to manage their habitats for people and nature.

The Organisation for Economic Co-operation & Development (OECD) reports that worldwide, countries spend \$318 billion annually on agricultural subsidies. These overwhelmingly go to supporting either meat or biofuels (OECD 2002). Virtually none of it goes to subsidizing fruits and vegetables. We have to redirect these harmful subsidies



Photo: [cleanenergycanada.org](http://cleanenergycanada.org)

The Environmental and Energy Study Institute in a 2019 report ([www.eesi.org](http://www.eesi.org) 2019) state that: “rather than being phased out, fossil fuel subsidies are actually increasing. The latest International Monetary Fund (IMF) report estimates 6.5 percent of global GDP (\$5.2 trillion) was spent on fossil fuel subsidies in 2017, a half trillion dollar increase since 2015” and that “fossil fuels account for 85% of all global subsidies,” and reducing these subsidies “would have lowered global carbon emissions by 28% and fossil fuel air pollution deaths by 46%, and increased government revenue by 3.8% of GDP.”

If this funding was directed at renewable energy, we could be largely independent of fossil fuels within a few years.

We need to talk politics, but in a non-political way, because biodiversity and climate policy is a highly political issue. Current personality politics will not solve this crisis. Politicians of all colours have to work together to resolve these, most important of issues

Forbes reported in 2018 (McCarthy 2019) that: “every year, the world’s five largest publicly owned oil and gas companies spend approximately \$200 million on lobbying designed to control, delay or block binding climate-motivated policy.”

So we all need to inform our politicians that we want them to make these difficult decisions, that they have our permission to be ambitious, and that we want them to

be tough on the drivers of destruction. We have to make our voices heard above the noise that immensely wealthy lobbying groups make.



Our next big hope is the climate meeting, the COP26 in Glasgow later this year. Before that meeting, we should all let our representatives know that we expect them to save us by making meaningful commitments to life on Earth, not empty promises of doing something, sometime in the future.

Write and lobby, whatever your political persuasion. You can bet that those companies causing most of the damage to our planet will be doing the same.

We need to stop the outsourcing of pollution by companies and ensure that all environmental impact is accounted for.



The International Criminal Court must introduce the crime of Ecocide.

Earlier this year, a court in France found the French Government guilty of failing to meet its commitments under the Paris Climate Agreement ([www.euronews.com](http://www.euronews.com) 2021) (no doubt they will appeal). Another group in the UK are preparing a case against the British Government in regard to the new coal mine to be opened in Cumbria.

We need to let our suppliers know that we will not purchase their products unless they are sustainable, fully recyclable and wildlife-friendly, and if not, they will be pursued through the courts for the harm they cause, and we need alternatives to GDP, which enable environmental damage to be calculated, in addition to the monetary value of corporate activity.

There are many alternatives and any would benefit biodiversity, by forcing a reduction in environmental harm.

To quote Sir David Attenborough again, “We are destroying biodiversity, the very characteristic that until recently enabled the natural world to flourish so abundantly. If we continue this damage, whole ecosystems will collapse. That is now a real risk.” So, the wider benefits of conservation and healthy environments potentially include our survival and the survival of this current, wonderful abundance of life on Earth. Unless we choose to act today to turn around humanity’s biodiversity crisis, our grandchildren will be watching those rich and exhilarating Attenborough wildlife documentaries on the history channel.

Thank you for listening.

## References

- Bendell, J. 2018. <https://jembendell.com/2019/05/15/deep-adaptation-versions/>.
- capitalscoalition.org 2018. <https://capitalscoalition.org/the-value-of-ecosystem-services-from-giant-panda-reserves/>.
- Churchyard, T. E. 2016. The biodiversity of the United Kingdom’s Overseas Territories: a stock take of species occurrence and assessment of key knowledge gaps. *Biodiversity and Conservation*.
- De Vos, J. E. 2014. Estimating the normal background rate of species extinction. *Conservation Biology*.
- iucn.org 2020. [www.iucn.org/news/species/202012/european-bison-recovering-31-species-declared-extinct-iucn-red-list](http://www.iucn.org/news/species/202012/european-bison-recovering-31-species-declared-extinct-iucn-red-list).
- Lawson, J. E. 2010. *Making Space for Nature*. gov.uk.
- Porrit, J. 2020. *Hope in Hell, A Decade to Confront the Climate Emergency*. Simon & Schuster.
- Ragusa, A. E. 2021. *Plasticenta: First evidence of microplastics in human placenta*. Elsevier.
- Sharpe, S. E. 2021. *Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope*. Taylor & Francis online.
- statista.com 2020. <https://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/>.
- www.bbc.org.uk 2020. [www.bbc.co.uk/news/health-53409521](http://www.bbc.co.uk/news/health-53409521).
- www.eesi.org 2019. <https://www.eesi.org/papers/view/fact-sheet-fossil-fuel-subsidies-a-closer-look-at-tax-breaks-and-societal-costs>.
- www.euronews.com 2021. <https://www.euronews.com/living/2021/02/03/french-government-found-guilty-of-climate-inaction-in-historic-victory>.
- www.forbes.com 2020. <https://www.forbes.com/sites/rpapier/2020/06/20/bp-review-new-highs-in-global-energy-consumption-and-carbon-emissions-in-2019/?sh=4c2f844466a1>.
- www.globalforestwatch.org 2020. <https://www.globalforestwatch.org/>.

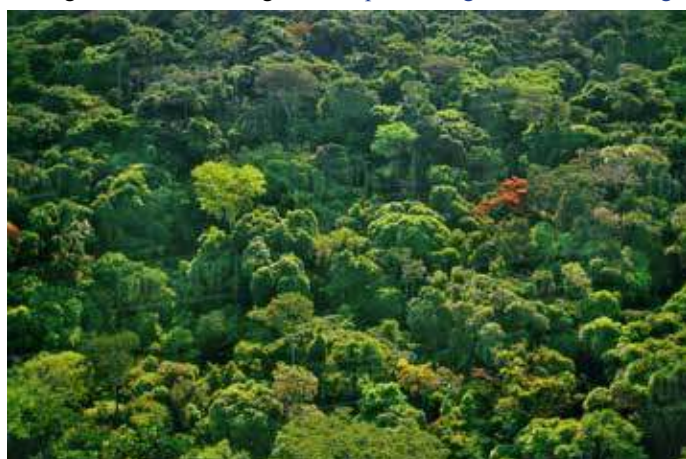


Photo: [dissolve.com](http://dissolve.com)

## Q&A

**Keith Bensusan:** Thank you for a very stimulating and strong follow-up to your talk in Alderney a couple of years ago. I think that there will be a lot to follow up, on both this talk and Jake Kuyer’s, in the general discussion.

**John Pinel:** Thank you.

**Kevin McIlwee:** Many islands cannot currently reduce their carbon emissions; transport is a major cost and there is not enough space for solar panels or wind-turbines. However species are both unique and an important contributors to biodiversity. Have you any suggestions about what Islands can do to mitigate climate change?

**John Pinel:** There are particular problems because islands tend to be small and do not contribute much to overall carbon load. However, we tend to have higher standards of living, compared for example with some places in Africa or South America. I rather disagree that there is not enough space for solar panels and wind-turbines, because where there are houses, there are roofs with space for solar panels. I used to hate wind-turbines but have reversed my view over the last few years, and would like to see a lot more. I would also like to see a lot more tidal energy research, especially here in Jersey with its 12m tidal range on spring tides – there is a lot of energy there. Most islands probably have some capacity. I object to the obscene sums of money being spent on subsidising fossil fuels. I know that countries like Saudi Arabia and Russia depend heavily on the sale of these but, if we work on our own governments, to redirect part of this spend to alternative forms of energy, this would be a large step forward. There are also lots of ways, at the individual and personal levels, to reduce carbon output. We just need to use every tool.

**John Randall:** You are absolutely correct that tree-planting is far from a panacea. What about creation of new wetlands, not to mention protection of existing ones?

**John Pinel:** Absolutely. Tree-planting is an important thing to do, particularly where this extends or restores existing woodlands and places where trees want to grow. There is a real problem in planting trees in alternative habitats, which might be more valuable [e.g. peat-bogs]. In regard to wetlands and the marine environment, we have lots of discussions here in Jersey on seagrass beds. We also have enormous amounts of seaweeds growing around the coast. If we can maintain the health of intertidal areas and coastal zones, that is going to be a huge carbon sink. But, of course, the problems we are causing to the oceans at present are phenomenal, including acidification, warming and pollution. It really does look as if, for example, we are going to lose all our coral reefs in the next 50 years. We must do more to protect our marine environment and stop putting our waste from land into the sea. But wetlands could play a huge part in flood-relief, carbon storage and biodiversity. Maybe, wetlands are where we should be going, rather

than tree-planting.

**Points from chat-box summarised below by Keith Bensusan, as Q&A time used up:**

**St Helena Community College:** Are we going to be able to speak as one regional UKOT & CD voice at CoP26?

**Joanna Pitt:** Bermuda has a tidal range of about 1 m. Many Caribbean UKOTs have even smaller tidal ranges. On wind turbines: there is resistance because of clutter interference with radar that is essential for aviation and safety at sea. It's awkward.

**Keith Bensusan:** In Gibraltar the concern regarding wind turbines, apart from visual impact, is possible impact on migrating birds.

**John Pinel:** Wind turbines are without a doubt, hugely problematic. Bats, birds landscape and other issues. Possibly less problematic than coal fired power stations though, with their issues around mining, air quality from burning, transport of coal from mine to power station etc. Small wind turbines on the roof of each house may be less problematic, but would contribute to the solution of burning fossil fuels.

**Keith Bensusan:** A couple of further points have come in, which I think I can address:

- (1) Re tidal power, many UKOTs have a small tidal range, but I can say that Gibraltar has been experimenting with wave power, with promising results.
- (2) St Helena asks whether we are able to speak as one combined UKOT/CD voice at CoP26. I can say that this was addressed by Gibraltar Minister Prof John Cortés earlier in the meeting, when he said that representations are being made so that we can do so.

# Natural Capital Accounting: Providing evidence for a green recovery

Jake Kuyer (eftec: Economics For The Environment Consultancy Ltd)



*Jake Kuyer*

Kuyer, J. 2021. Natural Capital Accounting: Providing evidence for a green recovery. pp 75-79 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

Crises create opportunities, and it is well documented that while Covid-19 has created many health and economic challenges, in forcing a shift from the *status quo*, it has also opened up the possibility of transformative change in society, with many calling for a “green recovery” from the disrupted state that much of the world finds itself in in 2021. However, despite best intentions, transformative change of this scale is immensely challenging and requires a considerable shift away from ‘business as usual’; any such shift should be based on sound evidence and an understanding of the economic and social consequences of policy and planning decisions which impact on the environment and its ability to sustainably benefit people everywhere. Natural capital accounting (NCA) is one such way to measure the flow of benefits that the environment provides, and to understand their value in economic terms. This lecture reports on the application of NCA in the UK Overseas Territories (UKOTs) and how it has been used to demonstrate both the direct links between the environment and the economy, and the economic value of more indirect benefits of the environment to the people of the UKOTs. The evidence provided in NCA underpins both how the environment supports the economy, and also how dependent society is on the environment. Such evidence can be used to make an economic case for the benefits of conservation activities which both maintain and enhance the value that the environment is able to provide.

Of particular importance for the Caribbean UKOTs is the tourism sector, which is the dominant economic sector underpinning much of the wider economy in many of the UKOTs (along with other small island developing states). Due to the economic importance of the sector, there may be a tendency towards prioritising short-term recovery by encouraging a tourism recovery at any cost. This would be a mistake if the result is to the detriment of the UKOTs’ natural environment on which the tourism sector is dependent (both to attract tourists and to provide protection for tourism infrastructure from extreme weather events), as any short term economic boost would be eclipsed by medium to long term decline in the environment and the economic value on which it depends.

Rather, economic evidence such as generated through NCA could be used to make a case for investment in conservation activities which build resilience in to the UKOTs’ natural environment, and their ability to sustainably provide value to ensure the long term viability of the UKOTs’ economies, and notably the tourism sector. This lecture outlines how the application of economic evidence in this way would support not just conservation in the UKOTs but also the broader “green recovery.”

*Jake Kuyer, Principal, Economics for the Environment Consultancy Ltd.  
(eftec) [www.eftec.co.uk](http://www.eftec.co.uk), [jake@eftec.co.uk](mailto:jake@eftec.co.uk)*

## Natural Capital Accounting

The natural capital accounting (NCA) approach helps frame the interconnection between humans and the environment in economic terms. The environment can be viewed as an asset, or natural capital, that provides a

revenue of ecosystem goods and services, which benefit people (Figure 1). This includes provisioning services, such as agricultural produce or fisheries, regulating services, such as protection from natural hazards and carbon sequestration, and cultural services, such as tourism and local recreation. These benefits can be

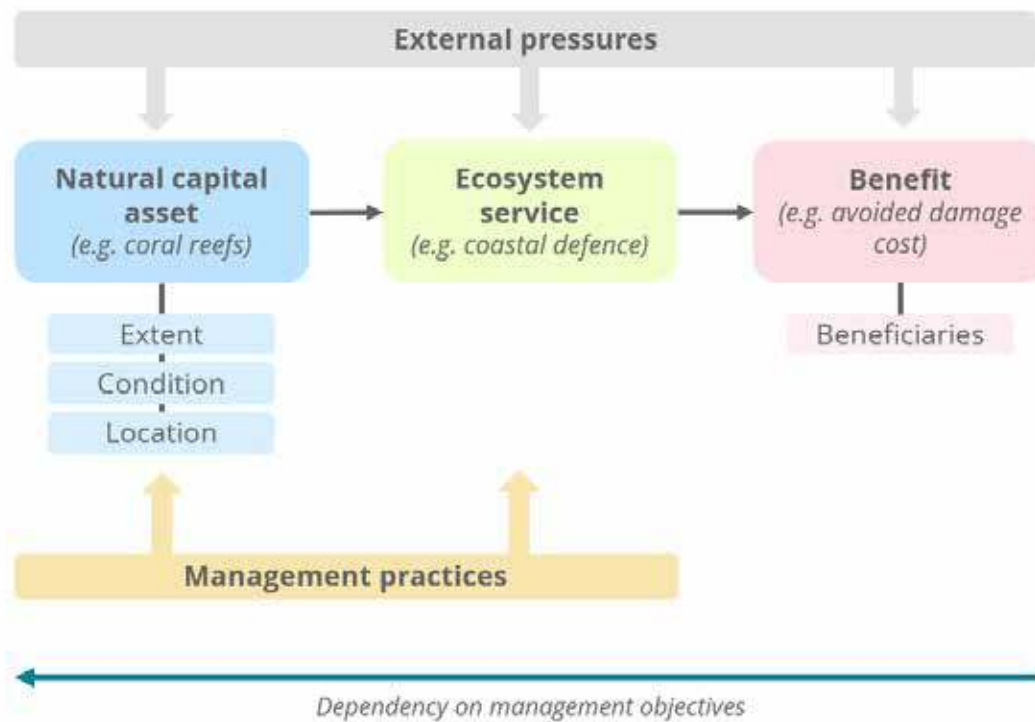


Figure 1. Logic chain demonstrating the components of the asset -> service -> benefit relationship which NCA systematically measures and presents consistently in structured Ecosystem Accounts

measured and valued in a consistent and structured manner, and compiled into an accounting framework, called ecosystem accounts. Ecosystem accounts produce environmental statistics which provide an evidence base on the benefits provided by the environment.

An ecosystem account is structured as a set of component accounts, each of which require data to be consistently collected and collated in a systematic way. The main components of an ecosystem account are:

- **Natural capital asset register** – an inventory that holds details on the state of all the natural capital, or environmental assets, that are present, including their extent and condition (quality and other relevant factors). For example, the spatial area of a reef system, and its health in terms of suitable indicators.
- **Physical flow account** – contains the flow of goods and services which are dependent on the natural capital assets stocks that are identified in the asset register. This includes benefits related to the provisioning, regulating and cultural goods and services provided by natural capital.
- **Monetary value account** – calculates the annual value of the estimated flow of benefits that are captured in the physical flow account. The overall asset value is estimated based on assumptions about the values of the physical and monetary flows into the future.

The combined accounts therefore monitor the presence

and state of different habitats, the benefits these provide, and the value that humans receive from them. When updated year on year they provide a useful means to monitor and evaluate growth or decline in any of these elements, while also helping to understand the relationship between the environment, the services it provides, and how humans use and value them. Ecosystem accounts provide economic evidence that supports the delivery of sustainable value from environmental assets within the UK Overseas Territories (UKOTs). Effective management of the environment must consider the extent and underlying condition of ecosystems over time, as well as the range of benefits they provide and the economic value of those benefits to different stakeholder groups. Specifically, the data in ecosystem accounts can help address several fundamental questions for policy and planning:

- What environmental assets are present and what state are they in? How does this change over time?
- What benefits does the environment provide? Who receives these benefits?
- What is the economic value of these benefits? What is the economic value of the underlying environmental assets and are they being managed sustainably?

The environmental and socioeconomic data produced within ecosystem accounts provide a basis for answering these questions. Their importance is reflected in the development of the [System of Environmental Economic Accounting – Ecosystem Accounts \(SEEA-EA\)](#), by the United Nations (UN). Due for publication by the UN in 2021, the SEEA-EA is set to become the international statistical standard for producing ecosystem accounts as

part of National Accounts by National Statistics Offices and thereby to provide a complimentary indicator set to other national economic and social indicators such as GDP and demographic trends. The evidence produced in national ecosystem accounts can support:

- Effective decision-making which impacts on the environment;
- Action on climate change, including mitigation, adaptation and resilience to impact;
- Delivery of international initiatives, such as the [UN Sustainable Development Goals \(SDGs\)](#); and,
- A green post-COVID economic recovery, and in particular a sustainable tourism sector.

## NCA in practice in the UKOTs

### Current activities in the Caribbean UKOTs

Caribbean Overseas Territories regional Natural Capital Accounting programme

- UK Government - Darwin Initiative funded programme
- Project outcomes:
  - Produce national natural capital accounts in the 5 Caribbean UKOTs
  - Build NCA capacity and a practitioners' network in the UKOTs
  - Produce aggregate NCA for all 5 Caribbean UKOTs
  - Provide accessible evidence on the value of the environment and interpretation to inform decision-making
- Regional connections:
  - Networking with regional practitioners
  - Connection with regional organisation and initiatives
  - Regional NCA practitioners conference

## NCA for policy and planning

Natural capital accounting as a process helps to:

- Collect data for environmental assessment and monitoring
- Facilitate engagement and data sharing across departments and organisations
- Organise data that demonstrate dependency on the natural environment of various sectors of the economy and the tax base (e.g. tourism, coastal protection)
- Interpretation of environmental statistics for use in strategy, investment, engagement and decision-making

Ecosystem account outputs help to:

- Measure and monitor improvement in the environment – “public money for public goods”
- Provide evidence base for planning and policy

objectives and decision-making

- Make investment case for protection and enhancement of habitats
- Inform if policy and management decisions are sufficient to maintain assets and sustain benefits over time (sustainability)
- Examine intergeneration values (i.e. values to future generations) and distributional effects
- However, they do have limitations:
- Accounting frameworks will never capture all values for the natural environment (i.e. partial measure of value)
- Monetary valuation cannot fully address sustainability concerns, and should only be used in parallel with physical accounts (biophysical and socioeconomic data)
- National account can contribute to national and regional policy, but not directly to site-specific decisions without further modification and analysis
- It is difficult to reflect non-utilitarian values (e.g. protection of endangered species), but these should still be included qualitatively.

As long as these limitations are understood, the NCA process is a very useful tool as it expands the evidence base and supports other activities to provide a more complete picture of the value of environmental assets.

## NCA and the Sustainable Development Goals

The flow of benefits from ecosystems are not evenly distributed through the population, and as a conceptual framework NCA can be applied to consider underlying drivers of value from the environment and provide evidence to help address interrelated socioeconomic inequalities. Ecosystem accounts can also produce indicators which align with other national and local priorities, including international initiatives such as the [UN Sustainable Development Goals \(SDGs\)](#). These indicators can help demonstrate progress, as well as highlight areas for improvement and potentially unexpected gains to be made from different approaches to environmental and economic management.



There are several key SDGs about social and environmental outcomes that could be supported by NCA, including SDG 1: No poverty, SDG 5: Gender equality, SDG 10: reduced inequalities, and SDG 13: Climate action.

## NCA for a green recovery and the tourism sector

Crises can create opportunities. While Covid-19 has created a health and economic crisis, in forcing a shift from the status quo it has also opened the possibility of transformative change in society. Any such shift should be based on sound evidence and an understanding of the economic and social consequences of policy and planning decisions which impact on the environment and its ability to sustainably benefit people everywhere.

NCA is a systematic means to measure the benefits that the environment provides, and to understand their value in economic terms. The evidence provided in NCA underpins both how the environment supports the economy, and how dependent society is on the environment, and such evidence can be used to make an economic case for management activities which both maintain and enhance the value that the environment is able to provide.

Currently around the globe there is opportunity to influence change as many Governments are adjusting economic policy to support short term economic activity. This policy is funded by a major increase in Government borrowing, which will be repaid over a long period of time, effectively borrowing from future generations for the economic well-being of the current generation. At least a portion of this funding should be directed to activities with long term benefit, such as ensuring a sustainable environment for future generations.

The natural environment can play a positive role in economic policy changes, including through a 'green recovery', and ecosystem accounts can demonstrate that the environmental objectives and spending are a suitable use of resources for both the short-term and long-term objectives. In particular, investing in natural capital for a 'green recovery' can:

- Have a higher proportion of labour inputs than other capital, leading to a higher employment impact per investment;
- Have a lower reliance on imports of (skills or materials), and so a higher domestic circulation from investment;
- Benefit all parts of the economy and society;
- Have lower capital and maintenance costs than other capital investment;
- Avoid depreciation if maintained, so investment can secure renewable benefits; and,
- Address climate change adaptation needs to increase resilience and benefits future generations.

Therefore it is an effective use of current Government investment to deliver natural capital objectives and climate policy targets - they will be significantly more expensive to achieve in future. In some cases, all that is

required is an alignment of policy and planning decisions to what is already intuitively understood about the value of the environment. This may require an evidence base to make more explicit links between the environment, the benefits that it provides to people, and the economic value of these benefits. Ecosystem accounts provide this link, and in doing so can support decisions which deliver a sustainable environment, a resilient economy, and prosperity and well-being to the people of the UKOTs.



*Anguilla, a Caribbean island, receives an estimated annual natural capital benefit of US\$72.0 million from tourism and US\$3.6 million from coastal protection (Anguilla 2019 NCA – available from the Department for Natural Resources). Photo: Jake Kuyser*

### See also:

<https://www.eftec.co.uk/services/accounting-natural-capital>

<https://jncc.gov.uk/our-work/natural-capital-in-the-overseas-territories/>

### Q&A (mediated by Keith Bensusan)

**Peter Richardson:** How has blue carbon been factored into existing NCA assessments in the UKOTs?

**Jake Kuyser:** We focussed mainly on the terrestrial, but we are quite aware of the importance of blue carbon; I know that some work has been done in the Falkland Islands, for example. It is definitely an area we are keen to incorporate. We are working on first or second iterations of the accounts and expanding the coverage year-on-year. This summer, we will be putting the 2020 accounts together, and are highlighting blue carbon as a priority area. However, currently there are data availability limitations and methodology issues. I would be happy to discuss more if you have thoughts or data. In general, the accounts are making use of existing studies and research, rather than conducting primary research. We are then employing environmental economic techniques to build them into an accounting framework.

**Peter Richardson:** Thank you - seems like there is a data gap in the UKOTs - good opportunities for future work.

**Gordon Steele:** The Dasgupta report, released in UK, highlights there are not, as yet, any universally agreed metrics for NCA. Will these you flag up as to be published get the support required?

**Jake Kuyser:** They should. It is an international standard that has been in development for a decade or more. A lot of work and expertise, and a lot of different governments and organisations were involved. Once adopted by the UN, that should filter down through national statistics offices, the idea being that then there will be a standard way of collecting and presenting these data, that can then be built in time into metrics. The metrics may already be valuable at the national level, where they can be used flexibly to provide information to fit in with national indicators. Re Sustainable Development Goals, it is not necessary at this stage to do that, but that does not mean that there are not ways to use these analyses in national or regional contexts and help to provide information to monitor and prioritise work. Our hope is that the Dasgupta report and UN publication drive things in this useful direction – and this is the expectation.

**Sarah Havery:** What is the time-frame for producing the aggregate NCAs for the five Caribbean UKOTs?

**Jake Kuyser:** We are starting individual territory accounts this summer (there is always a delay as we need a full year of data). They are being produced in a way compatible with the UN's System of Environmental-Economic Accounting—Ecosystem Accounting (UN SEEA EA). Once these are produced, then we can look at pulling them together – probably towards the end of 2022. The idea is that we all present and promote at the mini-workshop of practitioners about this time next year. We are quite excited about this because, as far as we are aware, this is the first time this sort of aggregation has been done. However, this is the direction that things are moving; so this could be a case-study for wider application. Eurostat in the EU is also looking to aggregate accounts but is at an early step.

**Gordon Steele** (following up on his earlier question, relating to the Dasgupta report): Will these techniques be accessible and cost-effective enough for small territories to adopt without diverting significant resources from practical activities – always an important question for small territories?

**Jake Kuyser:** This is, of course, a major challenge and central to what we are trying to do. We have been working with territory governments, usually their environment departments but also with their statistics departments. In TCI, Anguilla and Montserrat, we have produced a couple of iterations. For Cayman and BVI, we are in the first stages. So we are used to working in this context. The tools can be designed and developed to be handed over needing only a light touch in resources to operate them. Expanding the scope over time would need more resources during the development of the expansions. In many ways, it is similar to the production of GDP estimates. Small territories do produce these fairly readily, without the large staffings that big nations use. Some time is needed but we are designing to make the best use, and to provide extra help as needed. The

challenges can be overcome – there are difficulties but it is part of the work of the project to overcome these to provide meaningful and practical approaches.

Keith Bensusan thanked Jake for a fascinating talk stimulating valuable discussion.

# Floras of Gibraltar, old and new: botany and public engagement on The Rock

Keith Bensusan, Leslie Linares, Michael Grech, Charles Perez, Albert Gonzalez & Rhian Guillem (Gibraltar Ornithological & Natural History Society & Gibraltar Botanic Gardens)



*Keith Bensusan*

Bensusan, K., Linares, L., Grech, M., Perez, C., Gonzalez, A. & Guillem, R. 2021. Floras of Gibraltar, old and new: botany and public engagement on The Rock. pp 80-86 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

The flora of Gibraltar was first studied in detail by Victorian and early 20<sup>th</sup> Century botanists from the UK. They made important contributions, but with little meaningful interaction with the local population, in an era when people in the colonies did not benefit from full British Citizenship and were viewed as 'exotic' by visiting UK personnel.

The first Gibraltarians to take an interest in the flora of Gibraltar did so via photography, decades before the advent of digital photography that has so popularised nature photography. They did so during an era when an interest in wildlife was awoken in the local population, leading to local expertise and formation of a natural history society in a period when interactions between Gibraltarians and UK military personnel with an interest in natural history increased. There was also positive interaction with Spanish botanists following the opening of the border with Spain in 1985.

It was this grassroots movement in the population that led to a more widespread interest in conservation and the drafting of strong conservation legislation, including very complete protection of flora. Moreover, the constitutional evolution of Gibraltar and strengthening of Gibraltarian identity led to public recognition of endemic and near endemic species as important aspects of their heritage, which aids in their conservation.

In our new digital era, GONHS and the Gibraltar Botanic Gardens have produced the most complete and up to date flora of the Rock, online. This digital resource allows unprecedented access of botanical information by the public, for free, and has led to an increase in submission of new and interesting records from the public, largely via the adoption of digital photography. Thus, social, political and technological development have jointly assisted in the widest ever knowledge and appreciation of Gibraltar's rich and important flora among Gibraltarians.

*Keith Bensusan, Director of Gibraltar Botanic Gardens (GBG) & General Secretary of Gibraltar Ornithological & Natural History Society (GONHS), [kbensusan@gonhs.org](mailto:kbensusan@gonhs.org)*

*Leslie Linares, Botanical Section Head GONHS & Associate Researcher GBG*

*Michael Grech, GONHS Council & Associate Researcher GBG*

*Charles Perez, Ornithological Section Head GONHS & Technical Officer GBG*

*Albert Gonzalez, Information Systems Officer GBG & GONHS;*

*Rhian Guillem, Invertebrates Section Head GONHS & Scientific Officer GBG*

*All authors: Gibraltar Ornithological & Natural History Society & Gibraltar Botanic Gardens*

## Introduction

Gibraltar has a diverse and interesting flora that has been studied since the 19th Century. Although Gibraltar

is famously British, strong differences – and often tensions – have existed between the local population and the colonising power of the United Kingdom.

This dichotomy existed until recently and the study of

natural history in Gibraltar, including botany, was the domain of visiting UK personnel up to the 1960s. It was only after this period that interest was awoken among resident Gibraltarians, during a period of constitutional development and a growing sense of identity. In both cases, work was carried out mainly by talented amateurs. The awakening of interest among Gibraltarians has led to consciousness of the value of the Rock's plants, conservation efforts and wider dissemination of information up to the digital age. All of these points are explored here. Our intention is to provide an overview of these, rather than an exhaustive study.

## Gibraltar's Flora

Gibraltar is certainly of interest to the botanist. Kelaart (1846), who wrote Gibraltar's first flora, said "*Gibraltar, considered either as one of Nature's fanciful works, or as the key to the entrance to the Mediterranean, has an interest associated with it which is perhaps possessed by no other spot of equal dimensions*". The quote is hyperbolic perhaps, but it indicates the level of interest that its flora might generate in the expert or enthusiast.



Figure 1. Gibraltar is small but holds a diversity of habitats that are rich in flowering plants.

Gibraltar's land area is only 6.57 km<sup>2</sup>, but The Rock holds a high diversity of habitats that are rich in wild flowers, from sea level to its summit at 426 m (Fig. 1). These include Mediterranean scrub (maquis and the very biodiverse garrigue), cliffs and coastal habitats, including some very large stabilised sand dunes against the east side of The Rock that rise to over 300m, and which also provide excellent habitat. In all, 679 species of vascular plants have been recorded from Gibraltar, of which 597 are considered native (Linares *et al.* 2021). This diverse and colourful flora is typically thermo-Mediterranean Iberian, with the expected richness of many of the groups that thrive in the Mediterranean, such as geophytes and labiates. Of particular interest are some regional endemics, including two predominantly North African species that have their only European vestiges in Gibraltar, which lies just 24 km from Morocco and has a

similar limestone geology to Jebel Musa to its south. One or two species (depending on taxonomic preference) are true endemics, found in Gibraltar and nowhere else. The species status of the rarest of these, the Gibraltar campion *Silene tomentosa*, is undisputed. It is exceedingly rare in the wild and its survival may depend on its propagation at the Gibraltar Botanic Gardens (Fig. 2).



Figure 2. The endemic Gibraltar Campion is extremely rare, having been saved from almost certain extinction by the Gibraltar Botanic Gardens.

## Social History

Gibraltar is famously British, best known for its value as a military outpost, but also and especially more recently, the patriotism of its resident population. This population is diverse in its background and for the most part is not British in origin, with substantial migration from Spain, Italy, Malta, Portugal, Morocco, India and other places, as well as some from the UK. This diversity is captured well in a spread from the daily newspaper the Gibraltar Chronicle in the 1800s, entitled *A reminiscence of Gibraltar – The Main Street on a hunting morning*, (Fig. 3) where most of the people depicted presumably have nothing to do with the very British pursuit of hunting on horseback, or in Mark Twain's description of Gibraltar in chapter seven of *The Innocents Abroad*



Figure 3. This spread from the 1800s in the daily newspaper Gibraltar Chronicle shows the diversity of different peoples and ethnicities that make up the Gibraltarian population.

(1869), where he writes “*There is an English garrison at Gibraltar of 6,000 or 7,000 men, so uniforms of flaming red are plenty; and red and blue, and undress costumes of snowy white, and also the queer uniform of the bare-kneed Highlander; and one sees soft-eyed Spanish Girls from San Roque, and veiled Moorish beauties (I suppose they are beauties) from Tarifa, and turbaned, sashed and trousered Moorish merchants from Fez, and long-robed, bare-legged, ragged Muhammadan vagabonds from Tetuan and Tangier some brown, some yellow and some black as virgin ink – and Jews from all around, in gabardine, skullcap, and slippers...*”. This ethnic diversity of the Gibraltarian continues to be visible today.

The arrival of such a diversity of people was due to the economic opportunities offered by the colony, with its links to Britain and her Empire. The fortress and the commercial colony of Gibraltar evolved in tandem, and often in tension, as is well communicated in Finlayson’s (2011) *Gibraltar: Military Fortress or Commercial Colony*. A strong dichotomy existed between the local population and people visiting Gibraltar from Britain (mostly military personnel) during this period, who tended to view the local population as exotics, often in very derogatory terms. As an example, The Lord Napier of Magdala, who was Governor of Gibraltar 1876-1883, described the local population in his correspondence as “*these half-Orientals*”. Such attitudes persisted well into the 20<sup>th</sup> Century, as we shall see.

It was in this atmosphere that the study of botany began to develop in Gibraltar.

### **The Early Botany of Gibraltar**

There were no botanical records of scientific value from Gibraltar prior to the British period, which began in 1704. This is hardly surprising; Linnaeus *Systema Naturae* was only published in 1735. There were some sporadic records before the mid-1800s, but when the Swiss botanist P.E. Boissier visited Gibraltar as part of a more general work on Southern Spain (1835-1845), he remarked “*By the richness of the collection that I made in just a few moments, I was able to judge the interest that would be generated by a complete exploration of Gibraltar...I am astonished that a similar work has not yet been undertaken by some of the officers of the garrison.*” It wasn’t long before one of them did.

Lieutenant Colonel E.F. Kelaart M.D. (1819-1860) was posted in Gibraltar as army surgeon in 1843, and it was he who was the first Briton to study the flora of The Rock, culminating in his *Flora Calpensis* (1846), the first flora of Gibraltar. Kelaart collected specimens as part of this work and these are housed at the Royal Botanic Garden Edinburgh. Kelaart clearly recognised the value of travel to military personal with an interest in natural history, writing “*Amongst the advantages enjoyed by the*

*medical officers of the army, the opportunity which the service affords of visiting distant countries may justly be ranked as one of the most considerable, combining the pleasure and profit of travel with professional duties and culture; so that individuals, if intent on self-improvement, may derive at the same time a double benefit*”. Another quote in his flora seems to be aimed at the residents of Gibraltar, when he writes “*...where I thought it would be expected by the local botanist, who cannot have reference to new and expensive works; and who will, I trust, also find his inquiries facilitated by the observations, which were chiefly addressed to those friends who honoured me with their presence when my humble attempts were made to diffuse a botanical taste...*”. However, subsequent mention of acquaintances and field companions by name makes it obvious that these were from the UK in ethnicity and culture, most likely UK-born and military. There is no evidence of any meaningful interaction between Kelaart and Gibraltarians, certainly when it comes to botany.

The next study of the flora of Gibraltar was by the French military pharmacist J.O. Debeaux, in 1889. After this, Frere’s (1910) *A Guide to the Flora of Gibraltar and the neighbourhood* was followed by a very substantial contribution to the flora of Gibraltar by Major A.H. Wolley-Dod (1861-1948) of the British Army. Wolley-Dod collected plants extensively in the UK, California (USA) and the Cape region of South Africa, as well Gibraltar and nearby Spain during 1911-1913. His large herbarium, which he bequeathed to the British Museum, included many specimens from Gibraltar and its hinterland, which he explored well. Many of these eventually found their way to the Gibraltar Museum with the assistance of New Zealander botanist Betty Molesworth Allen, who by the 1960s had retired to the nearby town of Los Barrios with her husband, the ornithologist and photographer Geoffrey Allen. Wolley-Dod used these specimens and older records by other authors to compile a meticulous *Flora of Gibraltar and the neighbourhood* (1914). As well as the species list, Wolley-Dod provides a summary of the history of botany in Gibraltar, as well as making observations that would today be referred to as ecological. As with Kelaart before him, there is no evidence that Wolley-Dod ever made any meaningful contact with Gibraltarians, whose culture and social connections would have been quite different to those of visitors from the UK. Thus, none of this interest in botany was transmitted to the local population during the 19<sup>th</sup> or early 20<sup>th</sup> Century.

### **Persisting Trends**

Botany in Gibraltar remained the domain of visiting UK personnel until well into the 20<sup>th</sup> Century. During the 1940s, *The Rock* magazine, which was the magazine of the garrison in Gibraltar, carried articles on *The Rock’s Wild Flowers*, with descriptions and information on

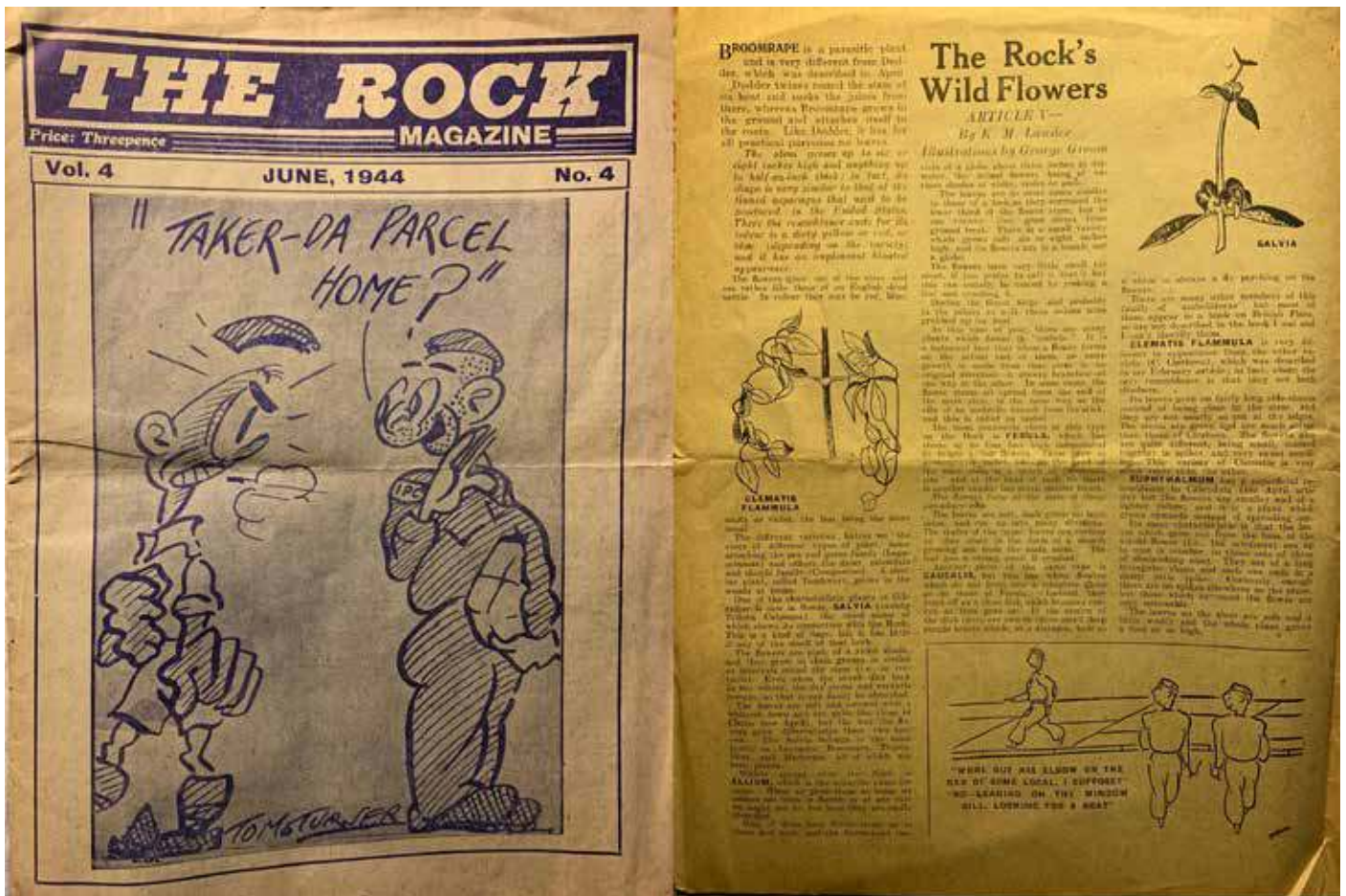


Figure 4. The Rock was a magazine produced by and for the garrison during the 1940s, which included articles on wild flowers. The cover of this issue illustrates the attitude of visiting military personnel towards the resident population. Images kindly provided by Alex Menez.

some of the more prominent components of the Rock's flora. It was still therefore UK personnel writing for UK personnel. An issue of the *The Rock* from June 1944 shows an example of such an article (Fig. 4). The cover of that same issue consists of a caricature of a derogatory nature that illustrates the persisting attitude of visiting UK personnel, many of whom would have ironically viewed the resident population as consisting of 'foreigners' who were different from people from the UK. But it wasn't simply a question of attitudes and perceptions: there were restrictions on which parts of Gibraltar Gibraltarians could enter and discriminatory conditions in the workplace with regard not just to salary, but even the toilets that employees were allowed to use according to where they were from. The latter persisted until the 1960s and it wasn't until 1981 that Gibraltarians (and Falkland Islanders) were granted full British Citizenship, followed by the rest of the Overseas Territories in 2002.

A publication on *The Wild Flowers of Gibraltar and Neighbourhood* was produced by the Committee of the Gibraltar Garrison Library in 1968, again a military organisation. This was a year before Spain closed the border with Gibraltar (1969-1982), following a referendum in 1967 in which 99.64% of Gibraltarians had voted for Gibraltar to remain British in sovereignty over being handed to Spain, and the passing of a new constitution in 1969. These events contributed towards a growing sense of identity and evolving political

aspirations. Also, the closure of the border restricted the population's leisure activities and Gibraltarians became involved in hobbies and intellectual pursuits in hitherto unknown numbers. It was during this period that some began to take an interest in the plants of the Rock.

### Botany and the Gibraltarian

Wildlife photography has become a very common pastime with the advent of digital photography. Photography was a far more specialised field before this, and it was two amateur photographers who became the first Gibraltarian experts in Gibraltar's flora, as well as being stalwarts of the Gibraltar Photographic Society. Arthur Harper (Cable & Wireless) began photographing and identifying plants in the 1960s and he was joined by Leslie Linares in 1973, when he returned from university to become a physics and mathematics teacher. They soon became the resident experts on the flora of Gibraltar and they have photographed every species that they have found growing wild on the Rock since the 1960s.

The border with Spain opened to pedestrians in 1982 and vehicular traffic in 1985. Relations between Gibraltarians and Spaniards have always been good at a personal level and with some Gibraltarians now interested in plants, this led to contacts being established with Spanish botanists. A good example of this is the characterisation of the vegetation of Gibraltar by Galan de Mera *et al.* (2000),

but the first involvement in the study of Gibraltar's flora by Spaniards was in 1985, when professors of botany from the University of Seville Benito Valdés and Salvador Talavera collaborated with then Curator of the Gibraltar Museum, Joaquin Bensusan. They collected material and deposited herbarium specimens at the Gibraltar Museum, as part of a wider study on the flora of western Andalusia that culminated in their *Flora de Andalucía Occidental* (1987). This is still the go-to reference for identifying additions to the Gibraltar flora.

It wasn't just an interest in botany that had been evolving among the resident population since the 1960s. Other Gibraltarians were pursuing distinct branches of natural history. The Gibraltar Ornithological Society, which was formed in the 1970s as the Gibraltar Ornithological Group, eventually became the Gibraltar Ornithological & Natural History Society (GONHS), bringing together all natural historians including botanists. GONHS worked hard to increase awareness of Gibraltar's natural assets, culminating in the development of strong conservation laws under the Nature Protection Act 1991. Schedule 2 of the Act lists all species of plants that are not protected in Gibraltar, which means that any species newly discovered that has not been introduced automatically receives legal protection. There is also a stricter level of protection for species that are rare or have a restricted distribution.

This growth of interest in the natural world accompanied Gibraltar's political development, which culminated in its 2006 constitution. It may indeed have been the growing sense of identity of Gibraltarians as a people which, coupled with educational work by conservationists, led to a more general interest in wildlife, particularly typically 'Gibraltarian' species that people identify with. Barbary macaques *Macaca sylvanus* are of course the best known of Gibraltar's species, but there is a strong sense of awareness of other species, birds and plants especially, that are special to Gibraltar and important components of Gibraltarian heritage. They are depicted, for example, on local coins (Fig. 5). This has engendered deep care among many about typically 'Gibraltarian' fauna and flora that never existed when information wasn't shared with the public, and this assists greatly in conservation efforts.

In terms of botanical awareness, the culmination was perhaps the publication of a 1996 field guide *The Flowers of Gibraltar* by three Gibraltarian authors: Linares, Harper and John Cortes. The book, which is beautifully illustrated with Linares and Harper's photographs, covers about a third of Gibraltar's entire flora and is widely owned locally. Discussions to update the book as a new, complete flora of Gibraltar were underway between GONHS and the Gibraltar Botanic Gardens. However, following the internet revolution, it was decided that an online platform would provide a more dynamic work that



Figure 5. A number of species are considered special to Gibraltar and emblematic. This five pence coin depicts a Barbary macaque *Macaca sylvanus* with Gibraltar candytuft *Iberis gibraltarica*.

is accessible to a maximum number of people, at home and abroad.

### The Digital Age

In our new digital era, GONHS and the Gibraltar Botanic Gardens have produced the most complete and up to date flora of Gibraltar, online (Fig. 6). It includes all species of plants that have been recorded in the wild in Gibraltar since the 1970s, complete with photographs, distribution maps and information for each species. This digital resource is searchable, including by flowering period (month) and colour of flowers, making it very user friendly even for those with little knowledge of botany. It therefore allows unprecedented access of botanical information from Gibraltar by the public, for free. The site is widely used by the public for plant identification, largely due to the increased popularity of photography in the digital age. As a result, there has been an increase in submission of new and interesting records of plants, including new additions to the flora of the Rock. The website can be updated with ease, which means that these records can be added to a dynamic, continually changing online flora.

Work is underway for further digitisation of Gibraltar's botanical assets. The Gibraltar National Museum holds 2771 herbarium specimens, collected by Wolley-Dod, Valdés, Talavera & Bensusan, and Linares & Harper. These have all been photographed, their entire data compiled and the records mapped as part of joint work by the Gibraltar Botanic Gardens and the Museum. The next step will be to create an online, virtual herbarium for Gibraltar, bringing together records from throughout the 20<sup>th</sup> Century, with the capacity to update the virtual



## Welcome to Flora of Gibraltar

The complete guide to Gibraltar's flora.

The site includes photographs, descriptions, habitat details and distribution maps for each species.

691 species of terrestrial, vascular plants have been recorded from Gibraltar. These include some endemic and restricted range species such as Gibraltar Sea Lavender (*Limonium emarginatum*), Gibraltar Restharrow (*Ononis natrix ramosissima*), Gibraltar Saxifrage (*Saxifraga globulifera gibraltatica*), Gibraltar Campion (*Silene tomentosa*), Gibraltar Chickweed (*Cerastium gibraltarium*) and Gibraltar Candytuft (*Iberis gibraltatica*).

By navigating this site, the user will be able to learn about the diversity of plants present on and around the Rock of Gibraltar.

**Citation:** Linares, L., Grech, M., Perez, C., Gonzalez, A., Guillem, R., Bensusan, K. **Flora of Gibraltar**. Available from [www.floraofgibraltar.myspecies.info](http://www.floraofgibraltar.myspecies.info). Accessed [ date ]



RECENT PAGES	RECENTLY ADDED LITERATURE	RECENTLY ADDED TAXON DESCRIPTIONS
<a href="#">Contact Us</a> Charlie Perez - 2018-01-05	<a href="#">Flora von Gibraltar</a> Charlie Perez - 2017-03-30	<a href="#">Lonicera implexa Aiton</a> Charlie Perez - 2019-11-07

Figure 6. A complete, illustrated Flora of Gibraltar is now available online: <http://floraofgibraltar.myspecies.info>

herbarium with new records. As with the flora, this will provide the public and researchers with unprecedented access to the herbarium, without the need to study specimens physically.

### Concluding Remarks

Many of the first experts to study Gibraltar's botany and wider natural history were visitors from the UK who were posted to Gibraltar as military personnel. Although their contributions to botanical knowledge were important, they did not interact with the local population, who would not have seen these visitors as part of their community. Without engagement of locals therefore, an increase in knowledge did not lead to a parallel increase in appreciation by locals. The study of plants by Gibraltarians only developed during and since the 1960s, in parallel with the community's social and constitutional evolution. This growing sense of identity may well have contributed to identifying with species seen as 'Gibraltarian'. Thus, in small communities, tying special species in with a local sense of identity can greatly assist in conservation efforts, because locals take ownership of species through their identity. This can be further enhanced by effective communication of the value of natural resources in a territory. In this sense, online platforms provide an unparalleled opportunity for dissemination of information and for feedback from the public.

### Acknowledgements

Dr Alex Menez kindly provided material and images.

### References

- Boissier, P.E. 1939. *Voyage Botanique dans le Midi de l'Espagne pendant l'année 1837*. Paris: Gide et Cie.
- Debeaux, O. & Duatez, G. 1888. *Synopsis de la flore de Gibraltar. Extrait des Actes de la Societe Lineene de Bordeaux, Vol. XLII*. Paris.
- Finlayson, T.J. 2011. *Gibraltar. Military Fortress or Commercial Colony*. Gibraltar: Gibraltar Books.
- Frere, B.H.T. 1910. *A Guide to the Flora of Gibraltar and the neighbourhood*. Gibraltar: Garrison Library.
- Galán de Mera, A., Cortés, J.E. & Sánchez García, I. 2000. La vegetación del Peñón de Gibraltar. *Acta Botanica Malacitana*, 25: 107-130.
- Garrison Library Committee 1968. *The Wild Flowers of Gibraltar and Neighbourhood*. Gibraltar: Garrison Library.
- Kelaart, E.F. 1846. *Flora Calpensis: contributions to the Botany and Topography of Gibraltar and its neighbourhood*. London: John Van Voorst.
- Linares, L., Grech, M., Perez, C., Gonzalez, A., Guillem, R., Bensusan, K. *Flora of Gibraltar*. Available from [www.floraofgibraltar.myspecies.info](http://www.floraofgibraltar.myspecies.info). Accessed 19/02/2021.
- Linares, L., Harper, A. & Cortés, J. 1996. *The Flowers of Gibraltar. Flora Calpensis*. Gibraltar: Wildlife (Gibraltar) Ltd.
- Twain, M. 1869. *The Innocents Abroad*. London: Penguin Books.
- Valdés, B., Talavera, S. & Fernández-Galiano, E. 1987. *Flora Vascular de Andalucía Occidental*. 3 Vols. Barcelona: Ketres.
- Wolley-Dod, A.H. 1914. A flora of Gibraltar and the neighbourhood. *Jour. Bot. (Supplement)*, 52.

## Q&A

**Ann Pienkowski:** How long did it take to get the online flora up and running?

**Keith Bensusan:** I recall it as about 2 years. Much of the information was already available, because of our leading botanist, Leslie Linares, who has pictures of all the plants recorded in Gibraltar and who keeps thorough notes. We are transcribing these to the web-site. We did at first have problems on the platform we were using but resolved it after many months. We had to map the species as well.

**Leigh Morris:** How did you digitise the herbarium - high resolution scanner or camera? Did you input all the information from the herbarium sheets or select?

**Keith Bensusan:** We used a camera with a fairly robust set-up, and this picked up well the relevant features on the plant. On the sheets, we recorded everything and we keep this in database software.

**Mike Pienkowski** (temporarily in the Chair): I see a question from St Helena. I could take this opportunity to mention that we had a quick chat with St Helena after the end of the last session. Those of you in that session, will recall that we had 2 microphones competing (or, rather, adding to each other) there, but may not be aware that there were, in fact, 27 people in the hall participating – there being no Covid-19 on St Helena and hence no meeting restrictions. So, an even bigger participation than was evident from the monitor count.

**St Helena Community College:** Thank you for the talk. Would it be possible to expand a little on your local engagement. How much and at what levels?

**Keith Bensusan:** Thanks: I had more on this in my draft but there was not time to include in the talk, but we will include it in the proceedings version. A lot of people got involved in natural history and other hobbies in the 1970s and 1980s, partly because of other lost opportunities after the border closed in 1969, and people needed to find ways to fill their time. Interest petered off in the early 2000s and we were getting worried. However, the digital revolution led to a renewed surge of interest, with people focussing on natural interest as photographers. There has been a lot of engagement too in natural history, via social media, websites and so forth.

**Ann Pienkowski:** I think it would be great to link this to other websites - can we do this?

**Keith Bensusan:** Of course, Ann. For those who would like to view the *Flora of Gibraltar* website: <http://floraofgibraltar.myspecies.info>.

**Mike Pienkowski:** Very many thanks, Keith for a fascinating talk which has filled the question time. We are now going to the talk which should have preceded this as we have contact restored there, and I am hoping also that, at the end of that, you will see the real session chairman's face, rather than mine, as he has managed to rejoin us too.

## ***Buy Back Bermuda: A campaign to save open space from development***

Andrew Dobson (Past President, Bermuda Audubon Society)



*Andrew Dobson*

Dobson, A. 2021. Buy Back Bermuda: A campaign to save open space from development. pp 87-90 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

Bermuda's landscape can be described as suburban in nature. With a population of over 60,000 and land area of only 57 sq. km., the remaining natural environment is under constant pressure from building development. In 2004 at a meeting of ECO Bermuda (a coalition of local environmentalists) members learned that 22 beach front condominiums were proposed requiring a pond to be filled in. The Bermuda Audubon Society concluded that the only solution was to buy the land at the market price, but would only likely achieve success as a joint environmental initiative with the Bermuda National Trust. *Buy Back Bermuda* was formed to buy areas of land threatened with development. Committee members Dr David Saul (former Premier of Bermuda) and Dr David Wingate (former Bermuda government conservation officer) became the faces of *Buy Back Bermuda*. To be considered for purchase, any proposed area must:

- Be at risk of development
- Have ecological value (natural habitat and biodiversity)
- Offer potential to be improved and managed as nature reserves
- Be contiguous with other protected open areas to create a greater area of open space and natural habitat
- Have the opportunity for pond restoration
- Have a connection to a historic structure or use
- Provide public access

The success of any project would depend not only on a successful fundraising campaign but also on the support of the whole community – the general public, private business, and the Government. The three projects at Somerset Long Bay East, Vesey Nature Reserve and Eve's Pond are all examples of successful campaigns.

*Andrew Dobson, Past President, Bermuda Audubon Society,  
andrewdobs@gmail.com*

### **Introduction**

Bermuda's landscape can be described as suburban in nature. With a population of over 60,000 and land area of only 57 sq. km. the remaining natural environment is under constant pressure from building development. In 2004 at a meeting of ECO Bermuda (a coalition of local environmentalists) members learned that 22 beach front condominiums were proposed requiring a pond to be filled in. The Bermuda Audubon Society concluded that the only solution was to buy the land at the market price, but would only likely achieve success as a joint environmental initiative with the Bermuda National Trust. *Buy Back Bermuda* was formed to buy areas of land threatened with development. Committee members Dr. David Saul (former Premier of Bermuda) and Dr. David Wingate (former Bermuda government conservation officer) became the faces of *Buy Back Bermuda*. To be

considered for purchase, any proposed area must:

- Be at risk of development
- Have ecological value (natural habitat and biodiversity)
- Offer potential to be improved and managed as nature reserves
- Be contiguous with other protected open areas to create a greater area of open space and natural habitat
- Have the opportunity for pond restoration
- Have a connection to a historic structure or use
- Provide public access

The success of any project would depend not only on a successful fundraising campaign but also on the support of the whole community – the general public, private business, and the Government. The three projects at Somerset Long Bay East, Vesey Nature Reserve and Eve's Pond are all examples of successful campaigns.



the pond, and these and invasive species removed. The pond was dredged and expanded to create a healthier environment for biodiversity and plantings of native and endemic flora undertaken. Special attention was given to creating a mudflat to encourage shorebirds and islands for breeding resident birds. Amenities include a small dock for pond-dipping, a bird hide, and educational interpretive signage. The reserve was opened to the public on Earth Day 2007.

### Vesey Nature Reserve, Southampton

This 8-acre property valued at \$1,550,000 was donated to Buy Back Bermuda by Sharon Vesey in 2009 and has been restored as a nature reserve with public donations to Buy Back Bermuda Campaign II. \$181,000 was required for restoration and management costs. It includes part of the valley containing Evan's Pond and a ridgeline extending all the way to the Little Sound. It also features two quarries (inland and coastal), a natural limestone sink hole and a variety of habitats, including mangroves, a lush woodland valley, an exposed hilltop and rocky shoreline. Amenities include walking trails, interpretive signs, a quarry exhibit, plenty of places to picnic and for children to play, benches to relax on and an observation platform with views of the Little Sound. Much of the reserve restoration was carried out by teams of volunteers from Bermuda businesses, Bermuda National Trust and Bermuda Audubon Society. The volunteers culled thousands of invasive plants, planted many native and

### Somerset Long Bay East (Pitman's Pond)

The initial project was to purchase nearly 3-acres of land at Long Bay in Sandys Parish. The land met the criteria for purchase being adjacent to the government-owned Somerset Long Bay Park and Audubon Society nature reserve. Pitman's Pond could be restored rather than turned into a condominium development. With 6-figure sums donated by the Bermuda Audubon Society, Bermuda National Trust and the Bermuda Government, the target of \$1.7m was reached by August 2005 thanks to further donations from private individuals and local business. Following the creation of a management plan, planning approval was gained and restoration commenced. Thousands of bottles were extracted from



Somerset Long Bay before (above) and after (below) management



Vesey Nature Reserve: (above) donor board; (below) on interpretative trail



endemics and helped to clear pathways. The reserve was opened to the public on Earth Day 2010.

### Eve's Pond, Shelly Bay

The 3.5-acre plot near Shelly Bay Park was purchased by Buy Back Bermuda with generous donations from many businesses and individuals. Cost price \$1,600,000. Restoration and management costs \$210,000. The site once had an inland tidal pond which was filled in with sand from the dredging of Flatt's Inlet in 1941 and, since then, has been a woodland consisting mostly of invasive species. Extensive research was done on the Green Bay cave system leading to and underneath Eve's Pond to ensure restoration plans would not disturb any sensitive areas. In March 2020 ground was broken with the removal of invasive undergrowth, shrubs and trees including numerous Chinese fan palms, persistent deep rooted cow cane and a stand of enormous *Casuarina* trees. This was followed by excavation of a new pond just as Bermuda was going into Covid-19 lockdown. With the help of volunteers, especially corporate workdays, more than 500 endemic and native plants and trees were planted. Wigeon grass and endemic killifish were introduced to the pond stimulating a boom in biodiversity with the arrival of damselflies, dragonflies, water striders, beetles, bugs, and birds. The Eve's Pond Conservation Management Plan includes: a new pond with its own island, walking trails with interpretive boards, bird hide and benches. The reserve is joined to a National Park via a walking trail. The current pandemic has delayed the official opening, planned for Earth Day, 22 April 2021.

Factors crucial to the success of these campaigns

- Key individuals with vision and expertise, especially Dr Wingate and the late Dr Saul
- Persons who can talk to big donors
- A dedicated committee
- Engaging volunteers from Bermuda companies, youth groups and members of BAS/BNT
- Big donors like to give to partnerships– the partnership between BAS and BNT was crucial as they both had good standing in the community
- A community effort– donations from private individuals, private business and the Government
- The promise of new areas for the public to enjoy

I wish to acknowledge the assistance in this article from Karen Border (President BAS) and Jennifer Gray (past



*Eve's Pond: (top) clearance and design; (above) corporate work days; (below) plantings.*



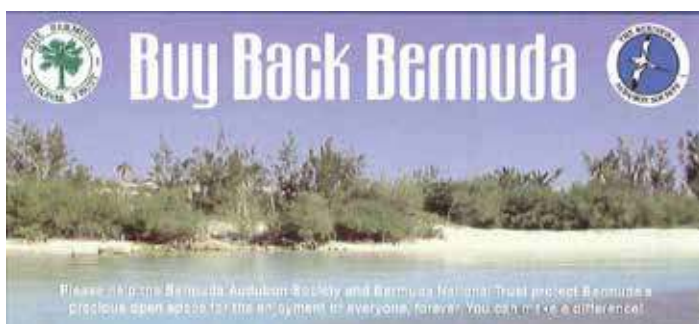
President BAS, former Executive Director BNT).

### Q&A:

**Andrew Dobson:** While we wait for any questions, I can comment that it is rather nice that we have Joanna Pitt here as one of the participants; she was telling me that it was as a chance call that she had with the owner of Pitman's Pond at the Somerset Long Bay site that alerted the whole event to EcoBermuda, an umbrella for a group of environmental organisations. If that hadn't have happened, there would be condominiums there now.

**John Pinel:** What was the existing habitat where you did the pond creation and did you have an idea of the vegetation that you wanted to bring back?

**Andrew Dobson:** Absolutely. We know what the native and endemic plant species are. If I told you that 95% or more of the vegetation in Bermuda is introduced,



including invasives, that's what one is fighting against. So, we knew we wanted to get back the cedars, the olivewoods and so on to that site – and mangroves, of course; we know how important they are. It is a battle, but one worth taking on.

**Peter Richardson:** Great work - how do you aim to inhibit invasive species creeping back in, plants but also cane toads...?

**Andrew Dobson:** Well, it's largely through volunteer effort. We do have help from the Government's Conservation Services, but we organise regular work-parties to pull up those *Casuarina* seedlings or what invasives there might be, to get rid of them. So, it is an ongoing battle, and we do rely heavily on volunteers from the Bermuda National Trust, the Bermuda Audubon Society and the general public – who enjoy it. Also, we have corporate days. There is a lot of big business in Bermuda and they are very keen, as part of their social corporate responsibility and awareness – more today than ever. They want to get their workers out into the nature reserves, doing their bit – which is great. Some of them have even adopted some of our nature reserves.

**Keith Bensusan:** Thanks for that. There has been a barrage of questions, following a slow start; so I am going to try to combine some of them.

**Howard Nelson** is asking who is currently responsible for managing the sites; and **Leigh Morris** is asking whether these sites will be open to the public or closed, and are there ongoing engagement plans?

**Andrew Dobson:** The management plans were set up by *Buy Back Bermuda*, which is a coalition of Bermuda Audubon Society and Bermuda National Trust, and we are responsible for the ongoing management and maintenance of those reserves. One of the criteria for the purchase of any property is that they should become open and available to the public. That's very important. So that is why we have nature trails and interpretative signage, so that the public can enjoy them. And there is another reason for that: one gets the public's involvement and feel of ownership of these places. Accordingly, when we were still short of a 6-figure sum for our first project, the Government was very keen to come in and help out. They were clearly keen to show their voters their support.

**John Pinel:** Thanks, Andrew. There are still more questions, so perhaps we can come back to those in the general discussion.

**Keith Bensusan (as Question-master) invited Joanna Pitt (on Bermuda) to answer in the chat-box any remaining questions (below) she wanted to:**

**Joanna Pitt:** All the nature reserves mentioned are open to the public and featured in tourist and local promotions. Regarding ongoing maintenance, the National Trust has a maintenance team, and the Government's Department

of Environment and Natural Resources also partners with the independently owned natural reserves to help with maintenance. A certain amount of routine work is done by the small work crew that has responsibility for the Government nature reserves. Larger projects are done by volunteers - either NGO members or via corporate support / donor days, as Andrew noted.

**Katie Medcalf:** Do the native species re-establish easily on the restored areas?

**Bryan Naqqi Manco:** What was the origin of the majority of donations -- corporate, individual, etc? How were donations managed -- specific account by BNT? And is land then held by BNT?

**Andrew Dobson:** Hi Naqqi. BBB has its own bank account. The reserves are jointly owned. If one NGO ceased to exist, assets would be transferred to the other.

**Simon Watkins:** What strategies did you find were the most successful in fundraising?

**Simon Busuttill:** What is the business plan/income streams to cover ongoing maintenance costs?

**Howard Nelson:** Is it difficult to raise funds to continue the management of the sites?

**St Helena Community College:** It is fascinating even if you have a small space restoration creates opportunities for nature to migrate into them. Also interesting are the differences in biological invasions between our territories. Bermuda cedar *Juniperus bermudiana* is doing incredibly well here, converting our pastures into forests. Delegates here on St Helena have offered to bring some cedar over to Bermuda if you need any!

**Joanna Pitt:** The surviving Bermuda cedars here have had to develop a level of immunity to the scale insect (imported on Christmas trees during the 1940s) that decimated the local population. We'd love to have your trees, and some samples might be useful from a genetic diversity perspective, but they might not survive.

*See Topic general discussion session for a further question and answer on this talk.*

**Keith Bensusan:** Thank you Joanna and thanks so much to all for staying engaged!

# Behaviour Change for Conservation – collective approaches to inspire more people to do something positive for nature

Leigh S. Morris (Chief Executive, Manx Wildlife Trust)



Leigh Morris

Morris, L.S. 2021. Behaviour Change for Conservation – collective approaches to inspire more people to do something positive for nature. pp 91-97 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

Across conservation organisations and environmental movements there exists the desire to change people's behaviour, in order to minimise their environmental impact and do something positive to help nature, wildlife, and the environment. There is a long history of campaigns and initiatives to promote more positive behaviour in people, which have had varying degrees of impact. Positively changing the behaviour of the masses of people on our planet remains the *holy grail* for environmentalists worldwide, ultimately to support the delivery of a global Nature Recovery Network and Nature-based Solutions to mitigate against climate change.

The federation of The Wildlife Trusts across the British Isles (46 individual Wildlife Trusts) have recently agreed that a key target for all of them is "People are taking action for nature" and they are in the process of adopting cross-federation initiatives to drive this behaviour.

The author has been involved in environmental education and public engagement for 30 years, in projects worldwide, in land-based/agricultural colleges, botanical gardens, zoological societies, and marine conservation. His career includes two years on the UKOT of St Helena, and he is now Chief Executive of Manx Wildlife Trust (MWT), an independent charity on the Isle of Man, a UK Crown Dependency. This paper outlines why driving behaviour change for conservation is important, and showcases approaches being employed by MWT across the Isle of Man, including digital public engagement, working closely with Manx farmers, and enabling more community members to undertake wildlife gardening at home.

The paper concludes by discussing several potential ways to upscale impact. These include, synergising the work of The Wildlife Trusts with other conservation organisations, linking strategies across the UKOTs and Crown Dependencies, and engaging enthusiastically with social scientists to inform, help design and revise approaches, and measure the impact of our actions.

Leigh S. Morris, Chief Executive, Manx Wildlife Trust, Isle of Man  
[leigh@mwt.im](mailto:leigh@mwt.im)

## Introduction

Across conservation organisations and environmental movements, including all UKOTCF members, there exists the desire to change people's behaviour, in order to minimise their environmental impact and do something positive to help nature, wildlife, and the environment. There is a long history of campaigns and initiatives to promote more positive behaviour in people across UK Overseas Territories Conservation Forum (UKOTCF) members, which have had varying degrees of impact. Positively changing the behaviour of the billions of people on our planet remains the holy grail for environmentalists worldwide, to achieve conservation aims and the delivery of a global Nature Recovery Network and Nature-based Solutions to mitigate against climate change.

The federation of The Wildlife Trusts across the British Isles (46 individual Wildlife Trusts) are currently in the process of producing a new strategy for the entire Federation, which will be launched at the end of 2021. This new strategy will have three broad goals (Figure 1), one of these being that *People are Connected to Nature, with 1 in 4 people acting for wildlife*. In parallel with the strategy development Wildlife trusts are in the process of formulating cross-federation initiatives to drive the required behaviour.

## Why change behaviour?

Ultimately, conservation is only necessary because of the actions – both conscious and unconscious – of people,



Figure 1. The outline strategy for The Wildlife Trusts federation, due to be launched in late 2021. One of the three core goals is '1 in 4 people taking action for wildlife'.

people still choose not to or are unable to act responsibly for nature. We collectively need to change this, and there could be tremendous wins for nature if we can.

### Case Study – Cornwall Wildlife Trust

All the Wildlife Trusts undertake behaviour change activities, but some have made this a far higher priority for their particular organisations. One of these is the Cornwall Wildlife Trust (CWT), and

their success to date in this area highlights precisely why all conservation organisations need to influence and work through others to help achieve our goals – we simply cannot do it all ourselves.

Approximately 0.66% of land in Cornwall is a CWT nature reserve but, by working with other audiences of people (notably farmers and landowners), CWT believe that c.21% of Cornwall is now managed in a 'nature friendly' way. The ambition is to go much further; to drive this, CWT ran sessions with their priority target audiences in mind and really drilled into their thinking and motivations. As a team, CWT challenged themselves

that over many years have impacted negatively on the environment. There are thousands of conservationists worldwide who undertake excellent work to conserve and restore species and habitats, but this is often outweighed by the actions of a larger majority of the world's population, and the corporations that influence their behaviour, which often do not have conservation as their foremost goal. This paper focuses on what we can do to support individuals, corporations, and communities to modify their actions to be more supportive of the environment.

The great opportunity we have, is that far more people (individuals and organisations) do things differently to reduce the overall negative impact human beings have on the environment in which we live. This includes recycling more, creating less waste, reducing fossil fuel use, keeping to footpaths in the countryside, cleaning up after their dog, reducing pesticide use etc. A huge range of approaches have been tried to stimulate such positive actions ('behaviour change') in the wider population, yet the great challenge remains that many

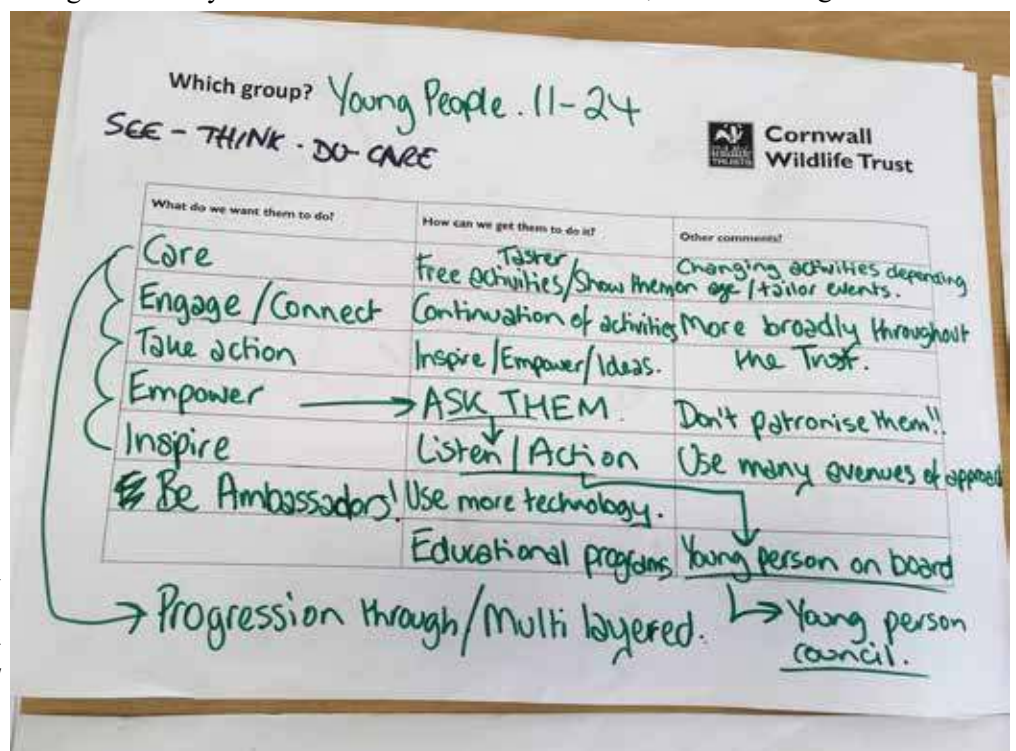


Figure 2. A completed worksheet from an internal Cornwall Wildlife Trust workshop, aimed at giving their team a far more targeted approach to behaviour change activities.

to decide what their key engagement groups are and what behaviours they wanted to try to change in each of them. A key audience for CWT is young people (Figure 2) and, following their team sessions, they developed a focused approach based on what they had learnt.

### **An Isle of Man Nature Recovery Network (NRN)**

The Isle of Man (IOM) is a small island (30 miles/48 km long by 10 miles/16 km wide) independent country, a UK Crown Dependency, and a UNESCO Biosphere – the only full nation Biosphere Reserve in the world. In terms of British Isles biodiversity, the IOM is situated in the centre of the British Isles and Irish Sea, a location which is strategically important for migrating birds and marine life, and therefore a key location in measuring the impact of climate-change and industrialisation on the Irish Sea.

Manx Wildlife Trust (MWT) is the largest environmental charity in the IOM, one of 46 wildlife trusts across the British Isles (Alderney is the other UK Crown Dependency with a Wildlife Trust), a recently joined member of UKOTCF, and an active participant in the broader global small island network.

There are c. 85,000 residents in the IOM and (Covid aside) an additional 300,000 visitors come to the Island annually (tourists and business visits), which is a huge potential audience for MWT. MWT is communicating and working with several audiences in the IOM, with the aim of driving and supporting more responsible conservation behaviours. Our key audiences are those that are resident in the Island, specifically: farmers and landowners, decision makers, corporates/businesses, the wider public (particularly younger people), and the Island visitors.

MWT is working closely with the IOM Government and the IOM UNESCO Biosphere Programme team to launch and develop an IOM Nature Recovery Network (NRN). MWT knows, however, that we need to engineer a situation where we have many people in the IOM working with us, and ultimately changing some of their existing behaviours, to achieve our NRN goal of 30% of the IOM being managed for nature by 2030.

### **Working with IOM Farmers**

Like CWT, we at MWT believe that one of the most important groups to work with are the farmers and landowners. Working closely with Manx farmers mirrors the developing ambition of all The Wildlife Trusts across the British Isles, who are collectively now looking way beyond the fences of our nature reserves and focusing on landscape-scale strategies to positively influence large areas of land.

MWT have 25 wonderful nature reserves spread across the IOM, which are crucially important places for nature. However, our MWT nature reserves cover just 0.2% of the IOM, compared to approximately 88% of the Island land area that is under agriculture. MWT will still cherish our nature reserves but, going forward, will have greater focus on positively influencing the behaviour and actions of our farmers and larger landowners. We recognise that there is a history of disagreement globally between farmers and conservationists, but we recognise that we need to work with farmers to change their behaviour and, if we can stimulate even a small positive change across 88% of the IOM, the win for nature would be great.

An important step for us in achieving this goal was the signing of a memorandum of agreement with the Manx National Farmers Union (MNFU) in 2020 (Figure 3). We now meet regularly with them, and are currently developing a joint education project for schools. MWT subsequently appointed an Agriculture Advisory Officer in early 2021, who will work with and support farmers, and we are planning to have a key role in the delivery of the IOM's new Agri-Environment Scheme that launched on 1<sup>st</sup> April 2021.

### **Engaging our future generations**

All conservation organisations agree that the education of future generations is critical, as we need them to understand, care, and behave positively towards nature and the environment. Several environmental organisations in the IOM deliver education and engagement sessions for schools and youth groups and, in 2020, MWT encouraged the Department of Education, Sport and Culture (DESC) of the IOM Government to



*Figure 3. Manx Wildlife Trust signed a memorandum of understanding with the Manx National Farmers Union in 2020, a key step in influencing the behaviour of farmers towards more nature friendly farming. L to R: Andy Cooper (MNFU General Secretary), Tim Johnson (MNFU President), Vivienne Davies (MWT Chair) & the author.*



Figure 4. The IOM Environmental Educators Group, set up to drive a more coordinated approach to educating younger people in the IOM.

set up a new Environmental Educators Group (Figure 4), consisting of representatives of DESC, Biosphere and the environmental NGOs (including: One World Centre, Manx Whale & Dolphin Watch, Beach Buddies, Curraghs Wildlife Park, and MNFU). The Group's overall aim is a more joined-up approach to the delivery of the United Nations Sustainable Development Goals and Eco-Schools across the IOM.

### Public Engagement

Engaging with the wider public is a core activity of environmental organisations, with the collective ambition that our engagement will ultimately drive/encourage/inspire people to behave in ways that benefits our environment and nature.

Public engagement takes many forms, and in the IOM, MWT do this in a variety of ways from formal education sessions to large public events. Our biggest engagement event annually is our Festival of the Sea (Figure 5), which is held over weekend in July at Port Erin in the south of the IOM. We erect a large marquee, install several tanks with a fresh seawater circulation system; local scuba divers collect live marine creatures, which are housed in the

Certificate course in Wildlife Gardening, which was fully booked out. It is a programme we aim to repeat and hopefully roll out across other Wildlife Trusts and UKOTCF member organisations.

Citizen science is another tactic to engage people positively about nature, and MWT has a wonderful team of volunteers who contribute to a range of programmes, which include upland peat surveys and

tanks, and these can then be viewed over two days by the public, with over 4000 people going through the marquee in 2020.

An important part of our IOM NRN is the encouragement of people to do more for wildlife in their own gardens. To stimulate this MWT has launched our own adult education



Figure 5: Examples of MWT's public engagement activities: Festival of the Sea volunteers with some of the marine life tanks (top); Conservation Officer, Andree Dubbeldam, delivering a Wildlife Gardening course (left); and one of our seal monitoring volunteers (right).

seal pup monitoring on the Calf of Man, a small island off the coast of IOM (NB: there are poster presentations by MWT volunteers on both these projects in these UKOTCF conference proceedings, in the sections on Topic 5 and Other Posters).

A challenge is that a large segment of the general public do not currently visit nature reserves and are not strongly motivated towards nature conservation, and might thus be regarded as a hard-to-reach audience. I know, from my two years based at the Royal Zoological Society of Scotland (RZSS) in Edinburgh, that there is a vast group of people, whose only significant engagement with nature takes place at a zoo, aquarium, or wildlife park. Such visitor attractions, therefore, offer conservation organisations a great opportunity for engagement with this key target audience and turn their nature ‘wow moments’ into changes of behaviour to support local conservation aims.

To this aim, MWT have fostered an excellent and developing collaboration with the IOM’s only such visitor attraction, the Curraghs Wildlife Park (CWP). Since 2020, in addition to international projects such as rhino and orangutang conservation, the CWP now actively promotes and fundraises for local MWT conservation projects, including Manx Shearwaters on the Calf of Man (Figure 6) and freshwater mussels in the Curragh Ramsar Site surrounding the CWP.



Figure 6. A recent interactive public display at the Curraghs Wildlife Park (CWP) promoting the conservation of Manx Shearwaters on the Calf of Man.

## Digital Influencing

On-line technologies are just one of many tools that can be used to engage with a target audience, but the potential for impact on huge numbers of people is so great with on-line platforms that it deserves a specific section on its own – it would be easy to write a paper on social media alone!

Digital engagement offers a tremendous opportunity if done well, to effectively communicate messages, stories, up and coming events, and calls to action to huge numbers of people. A key challenge is that there is so much digital traffic nowadays and it must be used well if you want to effectively reach the audience(s) you are trying to.

Over the last year MWT has upgraded our website ([www.mwt.im](http://www.mwt.im)) and recruited a Communications Assistant, Rachael Harrop, who has greatly expanded our digital reach and engagement through our online channels. One example is our MWT Facebook page, which now has over 10,000 Followers. MWT (and I’m certain many others) believe that our digital communication is influencing people positively and encouraging them to change their attitudes and behaviours to benefit nature. But is it?

## Increasing our Collective Impact

I am certain that many of the UKOTCF member organisations do superb education and engagement work that will have a positive influence of people’s behaviour, but an important question for us to ask ourselves is: Are we doing the best with the time and effort we are collectively investing in doing this? I suggest we are not yet achieving this and believe that the whole environmental sector needs to become far more focused as a collective if we want the global population to behave differently to help our planet.

Towards the aim of achieving greater behaviour change impact, the Federation of 46 Wildlife Trusts across the British Isles are now collectively adopting ‘Team Wilder’ ([www.hiwwt.org.uk/team-wilder](http://www.hiwwt.org.uk/team-wilder)), a public engagement campaign developed by the Hampshire & Isle of Wight Wildlife Trust (Figure 7). The belief is that such a coordinated approach will ensure the Federation maximises knowledge-sharing between the different Trusts and increases our overall effectiveness and efficiency. A tremendous opportunity exists that such programmes, if proved effective, could also be cascaded to and adopted by other conservation and environmental organisations and movements. Many of us strive broadly for the same goals and the same behaviour changes in our society and imagine if we all joined forces, selected the right audiences and behaviours, and had a joined-up approach to changing them. This could deliver game changing positive impact!

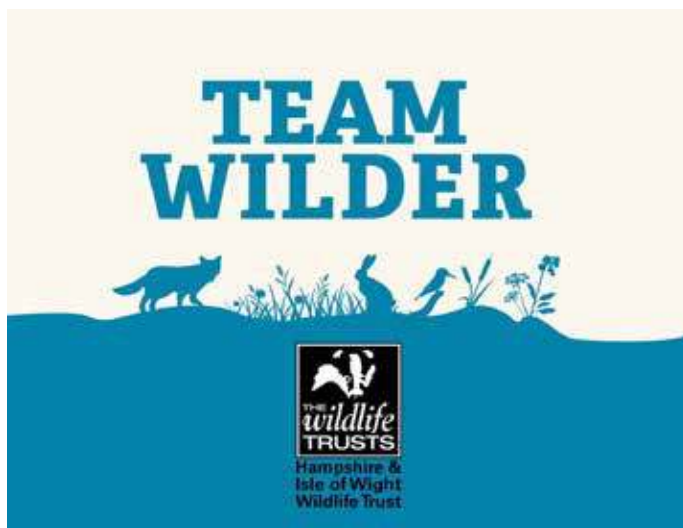


Figure 7. Hampshire & Isle of Wight Wildlife Trust have created the Team Wilder public engagement and behaviour change programme, which is being adopted by all The Wildlife Trust federation of 46 Trusts.

### We need social scientists!

As already stated, conservation organisations, to differing degrees, all deliver education and public engagement activities in order to positively change the behaviours of people towards conservation. In many organisations these activities are developed and delivered by conservationists – typically passionate people and excellent communicators, who create some wonderful engagement and education experiences. However, I believe we need to ask if conservationists (no matter how great communicators they are) are the best people to be doing this?

There is much written theory and many recognised approaches to changing people’s behaviour and, arguably, the best people at changing behaviours in large numbers of people are commercial marketing agencies, who specifically employ psychologists and other social scientists to help them develop strategies and initiatives targeted at specific audiences, products, and behaviours. I believe conservationists must recognise the fact we are not experts in behaviour change and get the right people to help us. Imagine the potential impact if the best social scientists helped the conservation movement create and deliver behaviour change messages and programmes.

The Wildlife Trusts are consulting with two notable social scientists with the ambition to develop and measure the success of cross-federation approaches to changing the behaviour of our key audiences: Dr Rose O’Neill, Natural England’s Principal Specialist for People, and the Environment; and Professor Katya Neves, Concordia University, Montreal, a Professor of Sociology and Biodiversity Conservation. I met Katya when she was studying the impact of botanical gardens influencing the behaviour of their visitors, and she first engaged with conservation in her work with whalers becoming whale watchers in the Azores.

### Joining up across Island networks

I will conclude my paper by bringing us back to the UKOTs, Crown Dependencies and other small islands. I have seen enough in the islands I have worked on and visited to know that there is the same enthusiasm there for motivating positive behaviours among the different island conservation organisations. However, resources on many of the islands are typically minimal, and there is potentially much to be gained from knowledge sharing and collaboration with others.

The expanded adoption and use of digital communications as a result of the Covid-19 pandemic (including this UKOTCF conference) has raised the digital capacity in islands and given UKOTCF members the ability to communicate as a group far better, without the need to travel. A tremendous opportunity now exists for UKOTCF members (and others) to jointly discuss, develop, deliver, and evaluate behaviour change approaches in their collective island environments. MWT would be keen to be part of such an initiative and delighted to share any of the programmes/resources we have developed with others. If there is interest in collaboration, I would be delighted to hear from you.

### Q&A

**Gordon Steele:** How do you manage to overcome lengthy debates over what “managing for wildlife” means? Active management often disturbs the purists who want to leave land for nature to lead the way?

**Leigh Morris:** I am going to relate that to a topic I am discussing with my colleagues. We have 25 nature reserves on the island and 8 of those are open to the public. Some people say we could open more and some people say we should open less. The thing that we are actually challenging ourselves is what a nature reserve is. Currently, all our land is termed a nature reserve but, on reflection, some pieces of land are actually high status conservation areas that we need to preserve, protect and maintain very carefully: pristine orchid meadows, for example. Whereas other areas are, for example, bits of wetland in an urban environment, where a board-walk has been put in and some scrub has allowed to grow – and actually they are more of a community engagement space.

So, it is a good question and, if I am interpreting it correctly, it depends on what the piece of land is. Personally, I think that there is a need for some land where you put a fence around it and you keep people out, but ultimately I tend towards getting people engaged where we can. It’s really all about people and, as we all know, you have got to get people to care. If you use some pieces of land to engage people, they may go away and do good things to other pieces of land. Land has got to be categorised carefully, and then managed in different ways.

**Catherine Leonard:** Really nice presentation, Leigh - thank you! And you're right ... partnership is the way to go!

Was too slow with my question. As well as getting us all on Zoom, the pandemic has shown how important access to everyday nature is – how do we maintain this post-pandemic? Really interested in how we continue to talk to people about nature, how we build emotional connections, how we reconnect with the passing of the seasons and traditions, etc, etc - would love to chat more about that Leigh!

**Leigh Morris:** Delighted to. Drop me an email... leigh@mwt.im

**John Pinel:** Could I add to Catherine's point about the changing seasons with the importance of our food choices and eating local and seasonally. Engagement with nature makes all this easier for people to appreciate.

**Amdeep Sanghera:** How has the pandemic changed views of IoM communities and stakeholders to nature reserves? Is there increased desire to see reserves expand?

**Leigh Morris:** Hi Amdeep, difficult to measure precisely, but undoubtedly "yes". Lots of evidence here of people going outside, visiting nature places and getting #CloserToNature which we and others championed as a Biosphere hash-tag.

**Amdeep Sanghera:** Thanks Leigh, great work you're doing!

## Championing UK's most special species: the wildlife of the UK Overseas Territories and Crown Dependencies

Lord (John) Randall (UKOTCF & House of Lords)



*Lord (John) Randall*

Randall, J. 2021. Championing UK's most special species: the wildlife of the UK Overseas Territories and Crown Dependencies. pp 98-102 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

The wildlife of Great Britain and Northern Ireland (GB&NI) is important but that of the UKOTs is hugely more so in international terms. For example, at least 94% of the endemic species (those that occur naturally nowhere else) depend on the UKOTs, rather than on GB&NI. (We say "at least" because the UKOTs have been far less studied than GB&NI, and new endemic species are being discovered as new studies take place.)

However, the human populations and economies of the UKOTs are generally small, so that limited financial and human resources are available to conserve these vulnerable species and special ecosystems – which also provide vital services for the human communities. The latter include hurricane protection, the basis of the economically vital tourism industry, water supply, fisheries and other natural products, and the quality of life. The citizens of UKOTs and CDs are UK citizens, and the lands and seas of the territories are UK sovereign territory. Wildlife of its family of 21 UKOTs & CDs are a shared responsibility of UK, which is committed to answering for them internationally.

Thus, these small places of UK territory and British citizens punch above their weight for the UK in terms of the globally important wildlife that depends on them – but they do not get the recognition and support they need.

We are inviting influential people, including UK Parliamentarians, and others with a high profile, such as sports-persons with links to UKOTs or CDs, to build a partnership with us to raise the awareness in Britain of the global importance of the wildlife of UK's Overseas Territories (UKOTs) and Crown Dependencies (CDs), and UK's shared responsibility for them. They can do this by agreeing to champion and promote one or more of these special species to help change the present state. This complements a similar initiative relating to species in Great Britain & Northern Ireland, by a consortium of conservation bodies for this area.

*Lord (John) Randall, UKOTCF & House of Lords, [randallj@parliament.uk](mailto:randallj@parliament.uk)*

The Overseas Territories and Crown Dependencies have a relatively small but very loyal group of parliamentarians both in the House of Commons and in the House of Lords who are avid supporters and who can and do raise a variety of issues regarding the territories on a regular basis at Westminster, covering a wide spectrum of issues.

There are All Party Parliamentary Groups for many individual territories as well as one that encompasses all of them.

Now, I know that this audience and fellow attendees at this conference are well aware of the fact that 94% of endemic species for which UK is internationally responsible for under international environmental

conventions are found in the Overseas Territories, rather than in Great Britain & Northern Ireland.

However, I fear that an even smaller number of MPs are aware of that incredible biodiversity found in the Territories. Not many will be aware, either, of the issues around the conservation of that biodiversity and the many and diverse threats to that wildlife.

As we know some of these are complex, and this last year has polarised many of these problems, not only because of the pandemic but also because of potential funding effects of Brexit.

I would like to think of myself as being pretty well



Above: example UKOTCF profile sheets for some of the species for championing

informed but I am constantly finding out more and more with my work as a Trustee of the UKOT Conservation Forum.

It has been a really fascinating learning curve particularly about non-avian wildlife of which I am far from knowledgeable – whether it be the endemic reptiles of the Caribbean territories or the unique cloud forest flora of St Helena just as two examples.

For a number of years in the Westminster Parliament and also in the Scottish Parliament and Welsh Senedd, 10 nature-focused charities, such as the RSPB, Buglife, the Bat Conservation Trust, Amphibian and Reptile Conservation, the Angling Trust, the Dragonfly Society, the Bumblebee Conservation Trust, Butterfly Conservation, the Marine Conservation Society and Plantlife have initiated a scheme of Species champions. (I apologise if I have forgotten any organisation.) The aim of the project is to pair MPs up with threatened and endangered UK species. The project currently involves 47 MPs covering all the major political parties, with these MPs championing a huge range of species from Atlantic Salmon and the ruderal bumblebee, to the urlew, natterjack toad and violet click beetle.

The idea is that these MPs work to take the plight of their species to the heart of our political system – undertaking

activities such as speaking up in debates, tabling amendments to legislation, and writing to Government Ministers. Their efforts are crucial to keep a focus on the importance of species and nature conservation as the Government works to tackle the Nature and Climate Crises.

The Species Champions project undertakes the following activities:

- A mounted poster and factsheet on the species;
- Group visits to major conservation projects and reserves around the country;
- An annual *Species Champion Awards Reception* in Parliament, where MPs' efforts to support their species are recognised;
- Roundtables, dinners and webinars for MP Champions on issues of particular importance for species and nature, often with guest speakers;
- Species-specific briefings for use in Parliamentary debates and legislation;
- An annual reserve visit for the staff of MP Species Champions;
- Other *ad hoc* activities, such as suggestions for oral questions and group interventions at pivotal moments (such as in the planning reforms and the Green Recovery) and annual 'days' (such as *Dawn Chorus Day*)

I have seen the real value of these champions at first hand. For example, it was as a result of the persistence of the Westminster MP curlew champion that I convened a successful curlew summit in No.10 when I was the Prime Minister's adviser on the environment.

More recently, the hedgehog champion tabled an amendment to the Environment Bill currently going through the House of Commons to give more protection to the hedgehog.

So we thought that this idea might be well be a great way to promote the species and biodiversity of the UKOTs, perhaps with the added bonus of making MPs and Peers more aware of the UKOTs themselves, rather than just names on a map.

However, we will need to tailor the scheme specifically for the UKOTs and Crown Dependencies as some of the UK activities would not be practical or possible for the territories.

The lock-down due to Covid-19 precautions has somewhat paused our work on this but it has at least given us a chance also to think more about how the process could work better for nature in the UKOTs.

One variation from the Westminster model is possibly that we think that we should perhaps also include recruiting potential champions from outside Parliament, perhaps amongst prominent individuals, sports people and even organisations with connections to the Territories, probably twinning with the parliamentary champions. I think we could also try to establish links with schools both here in the UK and the UKOTs themselves.

The hardworking team at the UKOT Conservation Forum, together with partners in the UKOTs and CDs have brought together a pretty good list of potential species and they will also be using the material brought together in this initiative to raise the profile of these species and the crucial environments of UKOTs and CDs. I have to say that, on perusing the list, it really brings home the incredible biodiversity that we are talking about.

They identified some of the main living organisms as groups, not in terms of their true taxonomic classifications, but highlighting some of the flagship species. While new discoveries are being made all the time, there is a slight bias in the list of potential species towards terrestrial species in order to attract more attention towards the terrestrial environment. This is because most endemic species are found there. That is not to say that marine species are less important, but the purpose of this exercise is to encourage more attention to the UKOTs and CDs in general and, at present, far more

UK resources are being devoted to marine than terrestrial conservation in the UKOTs.

However, I have now come to a bit of a dilemma. There are so many great species candidates on the list and we will only have a limited number of potential champions. I also want to avoid the risk of watering down the initiative by concentrating on quality rather than quantity. I'll give you an example of this. I was part of a meeting re-forming the All Party Turks and Caicos Group within Parliament, headed up by a very energetic MP, Alicia Kearns, together with a small but enthusiastic group of MPs and Peers.

I tentatively pushed this idea of species champions and mentioned various species. I pretty immediately had willing volunteers for several species.

Then I thought what are we going to do with these eager MPs and, as I knew several of them are also interested in other UKOTs, would all my potential champions be used up just on TCI? So I have been thinking about possible different scenarios for us to consider before going forward. These are:

- A champion for a single species
- A champion for the biodiversity of a single UKOT
- Or a champion for a group of species or taxa.

The first two categories are pretty self-explanatory but, for the third option, I will give some examples. We could have:

- A reptile and amphibian champion
- A seabird champion
- A flora champion
- A tree champion.
- A reef champion
- A penguin champion
- A marine champion.
- There is a fourth potential group which might work and that is mirroring the working groups of the UKOT Conservation Forum such as Wider Caribbean area, the Southern Oceans and Europe Territories, with several MPs and Peers for each area.

That, colleagues, is the concept and general idea. I and a number of peers and MPs are very keen to get going with this. Our problem is now deciding which model or indeed combination to go for. That is where I hope to get some thoughts from you. I would be really grateful for your thoughts so it is now over to you.

I am keen to get this exciting initiative up and running as soon as possible to do what we can for conservation in our wonderful Overseas Territories.

## Q&A

**Elizabeth Charter:** What a great idea!

**John Pinel:** Thank you very much. I think that we can all

use this, and I do like your idea of groups of taxa.

**Keith Bensusan:** Is each territory's capacity to help itself factored into the choice of species to champion?

**John Randall:** Of course, the whole diversity across the territories is rather complicated, not to mention islands like Gough and Henderson that we were talking about earlier today that don't even have a human population. But it shouldn't be a problem. What I would really like to see, though, that these champions to play a role in education, picking up Leigh's points. If MPs could find a school in their own constituency to twin with a school in the Overseas Territories or Crown Dependencies, it would get the kids in the UK also aware of what is going on the Territories and finding out what they mean. One of the things that we have been trying to do also – and I think we have got a little way – is, where there is a diaspora with territory people in UK, link those in too where that would help. I am very happy to go with any ideas, but I am very keen to get this going.

**Mike Pienkowski:** If I could just jump in, when we were drawing up the original list, there was a lot of consultation with people, both NGO and governmental, in the Territories as to which species they wanted to put forward. There was a very enthusiastic response – almost as great as when we suggested a conference! Obviously, we are moving to another stage now, the way we address this, as John was describing.

**Kedell Worboys:** Maybe this is something that could be discussed at the upcoming Environment Ministers Council, so that there is buy in from the locally elected governments.

**Roland Gauvain:** The Wildlife Trusts have been developing the approach of having champion trusts, or groups of trusts, to help bring focus to key issues or species. I could definitely see this as a way of bringing UKOTs and CDs together in communicating with Parliament. Would you see issues created because of the difference in relationship with Parliament between CDs and UKOTs?

**John Bothwell:** Might it be that the cross-party territory-specific committees taking up more conservation-specific advocacy might be a workable approach that doesn't overtax the political resources and doesn't run into the problem of UK resources being directed to causes, or species, in ways that the territories don't really find useful, as happened with turtles.

**John Randall:** In relation to Roland's question, don't think there is a huge problem. As I mentioned earlier, both UKOTs and CDs have a pretty loyal band of MPs and Peers who support them. For example, only last week, we had a meeting of the Isle of Man All-Party Parliamentary Group (APPG), where we had the Chief Minister addressing us. I am sure that you will be pleased to know that I mentioned the support that the Manx Wildlife Trust is giving to this conference and the work

they are doing. Occasionally, of course, there will be political problems that arise between UKOTs and the Westminster Parliament – or Government, more usually. Things that we will be coming on to in later conference topics include things like Stony Coral Tissue Loss Disease, about which several people are now asking questions. I think that raising more awareness is the whole basis of this initiative. There is an appetite amongst MPs on climate-change and the biodiversity crisis. Unfortunately, the biodiversity crisis is the Cinderella of the two and I am trying to change that. They are completely related to each other. I think that we just have to work hard at getting the message across.

**Amdeep Sanghera:** Lord Randall, could there be role for MPs to expand from species to include championing habitats and marine protected areas in the UKOTs, especially in regions that need support such as the Caribbean, with regards to UK Gov support such as Blue Belt?

**John Randall:** I think that is something with a real possibility, as species can't exist without their habitat – which is central to this, and we have heard how habitats are continually being lost. The idea of a mangrove champion or an eel-grass champion would be good, and not just for the UKOTs. The project is not to confine to be just species champions but wider, using the advantage of species being attractive flagships for the wider objectives. I spent a long time in Parliament and I was Deputy Chief Whip, so I know the vagaries and the ways of MPs. When I started touting this around, immediately I found someone who is interested in the blue iguana – and the more obscure the name, the better they like it. But I want to make sure that they are not just champions because they want to add it to their CVs: I want them to really take an interest. Now, it's relatively easy for Parliamentary visits for Gibraltar, for example. Perhaps, in normal times, the Falkland Islands have a visit about once a year. However, it is much more difficult for a champion to be involved there than it would be in the British championing programme. However, the pandemic may have provided us with another model, because we have found that there is a lot we can do on calls like this. I mean, this conference is amazing. It has actually meant that I could take part in it and, during the luncheon interval, I was actually asking some questions in the House of Lords and then get back again – which I would not have been able to do even if the conference was in London. So there is a lot of potential here, even for UKOTs and certainly some of the NGOs, to produce a short 10-minute presentation. I think that we could 'sell' all sorts of ideas.

**Mike Pienkowski:** I wonder if we should be selling 'habitats' as 'ecosystems' because all a habitat is is somewhere where something lives, whereas ecosystem is becoming more widely recognised (especially in the term ecosystem service) as an integrated entity. I admit that neither is as immediately attractive a 'handle' as a

species.

**John Randall:** I agree with you at one level, Mike, but as a former retailer I think that it might be better to sell using a term that they are more likely to understand.

**Mike Pienkowski:** I certainly agree that it is best to tailor different terms to different audiences.

**Joanna Pitt:** Actually, MPAs in the UKOTs strikes me as one of the topics most discussed by Parliament.

**Isabel Peters:** Thank you for your support - we like your ideas.

**St Helena Community College:** Habitats championing would potentially be a way of drawing UKOTs and CDs together where they have commonalities.

**Elizabeth Charter:** Perhaps pick a flagship species and their habitats for a champion.

**Joshua Smith:** The WWF tried to popularise the term terrestrial ecoregions. Breaking all habitats into 14 major habitat types. What about if we grouped each champion with a major UKOT habitat type/ecoregion, tied with an associated charismatic flagship taxa. Could that maybe dance the line nicely between scientific categorization and political marketing?

**Stephanie Martin:** It's a wonderful idea to link schools because kids in the UKOTs, such as on Tristan da Cunha, are closely linked to the wildlife on their islands. To share that knowledge with school kids in the mainland UK would be fantastic.

**John Randall:** One thing I have noticed with policy makers is the influence of their kids. I saw it at first hand. So, while it is up to us oldies to do what we can, if our kids or grandkids pester us that can be very effective.

**Keith Bensusan:** That's why I don't have any John: I really cherish my views and habits!

**John Pinel** (*chairing*) *picked this issue up again in the general discussion:* I think that this is an absolutely brilliant idea. With Zoom these days, you could link your classes from one school in Jersey to another in Tristan da Cunha, time zones dependent. But I think the young people in those classes would benefit hugely from discussions of what their colleagues' day-to-day lives are like, what birds do they see out the window, what the trees are like in their island, and things like this. It is a really good idea for cross-fertilisation of school classrooms and their education.

**Andrew Dobson:** If I can come in there, during my teaching career in Bermuda, some of my colleagues had gone back to England to teach and they did precisely that: had a link-up with their class in England with ours in Bermuda – not my class but some of the primary groups. It was brilliant; they loved it, like a highlight of the week. They did it for several weeks running, seeing what was going on in another country. I went in on one occasion and talked about birds to them and it was terrific, great value.

**Mike Pienkowski:** I think that this is excellent. I think

that, for some of the territories that need that most, there are still challenges; we alluded earlier to the high expense of the internet connections to St Helena and there are band-width problems in connections with Tristan. We should also be pressing to improve that situation, as well as trying to move these ideas forward. Excellent idea, which builds on some of the things that UKOTCF tried to do some years ago with the technology of the time.

**Leigh Morris:** I am inclined not to tempt fate, but we and another couple of other organisations have put a funding bid into the Manx Lottery Trust to do something hopefully around this. We are pitching around the UKOTs and CDs to try and connect people with an ambition of having someone like a youth forum which we might do online. So I did not create the idea but I think that these are really good ideas. We are working with the Farmers Union who are keen to try get the farm-food message in there as well around sustainability, and also an organisation some of you will know, called the One World Centre, another Manx organisation involved with global sustainability and development. So, we are trying to get a bit of cash to do this. If we do get the cash, then I will be in touch with some to pilot this.

But I come back to my point that we all do these things and it's great, and we know it makes a difference, but the big question is how much difference does it make and are we actually getting bang for our buck when we do all this engagement and education. We sort of know it works we know it is worth doing – how can it not be? But is it the best approach? It is difficult to measure.

**John Pinel:** There is another point here on a similar vein from Shakira, which I think is an excellent idea.

**Shakira Christodoulou:** Re Lord Randall's championing idea and as regards emotional response to the environment – as well as connections between schools (which is a brilliant idea!) – how about also forging connections between MPs' constituencies and UKOTs/CDs through the arts? Linking crafters, writers, artists across the world around their responses to their 'championed' habitat/species? Art influences society etc...?

**Joanna Pitt:** Bermuda Zoological Society holds an environmental youth conference. That might make a good link.

## Learning from networks of wetland educators and NGOs

Connor Walsh (International Engagement Officer, Wildfowl and Wetlands Trust: WWT)



Connor Walsh

Walsh, C. 2021. Learning from networks of wetland educators and NGOs. pp 103-105 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

Participating in international voluntary networks can bring benefits, especially in public engagement work. This poster looks at the example of Wetland Link International (WLI), run by the Wildfowl and Wetlands Trust (WWT). Resolutions VII.9, VIII.31, and X.8 of the Ramsar Convention on wetlands enshrine work in Communications, Engagement, Participation, and Awareness (CEPA); the role of national CEPA Focal Point to the convention; and encourages participation in WLI. Examples of how the WLI network helps environmental educators and visitor centres strengthen their work include: directly connecting distant places linked by shared migratory species and individuals, such as the Dutch island of Terschelling with the Basque Country estuary at Urdaibai; Erasmus+ exchange that coincidentally inspired staff on visitor centre facilities; and video conferences between shared language-groups of children in the same bird flyway. Many conservationists are used to being part of nature clubs; networks are different from clubs and being aware of this can help guide expectations and thus develop projects and products that would otherwise be beyond the capacity of an individual visitor centre.

Connor Walsh, International Engagement Officer, Wildfowl & Wetlands Trust, Bowditch, Slimbridge, GL2 7BP, UK, [connor.walsh@wwt.org.uk](mailto:connor.walsh@wwt.org.uk)

Learning from networks of wetland education centres  
What is a wetland education centre? The most bare-bones version would be a boardwalk through a wetland where a volunteer gives talks.

Add interpretation sign-boards and activities and you are already growing the key areas of public engagement for wetland conservation.

Many figurative paths diverge from that simple



boardwalk to develop an appropriate wetland centre. These range from buildings welcoming a million people a year (Hong Kong Wetland Centre), to for-profit businesses, to civil society organisations engaging the local community and government.

### CEPA

These activities are enshrined in the Ramsar Convention for the Protection of Wetlands. The acronym CEPA



Wetland education centres: (left) Boardwalk, Hong Kong; (right) Visitor centre, Suncheon



*WLI members*

stands for Communications, Education, Participation, and Awareness. It is instituted in a Resolution, making it a part of the Convention's work. Member states are encouraged to have a national focal point for CEPA, who can be government or NGO; there is an international CEPA Oversight Panel; and the Wildfowl and Wetlands Trust (WWT) runs Wetland Link International (WLI: <https://wli.wwt.org.uk/initiatives/biowet/>), a voluntary support network of people who work or volunteer in wetland centres.

This poster looks at some of WLI's approaches and partners, with the intention of encouraging local conservation groups to use the networks relevant to their field, to become more effective at CEPA work.

### **In-person exchanges**

External funders can enable in-person exchanges. The WLI network secured EU Erasmus+ funding for teenagers at four wetland centres. Primarily for young people to travel, it also included a couple of centre staff. By chance, the staff from the EVOA wetland centre in Portugal saw that WWT Martin Mere had a large chalkboard for marking up recent bird sightings. She was inspired and arranged for a whiteboard, as a locally suitable equivalent, to be installed at her centre when she returned to Portugal.

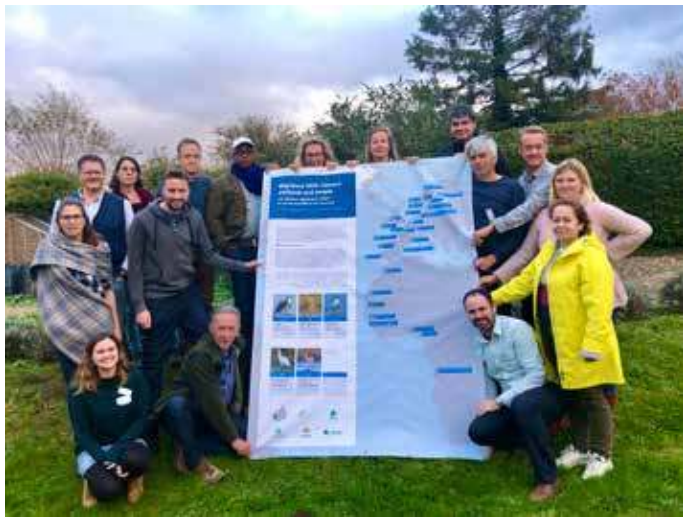
### **Virtual exchange**

In 2019, wetland conservationists in Canada and

Chile had a low-cost centre-twinning, in the form of an online exchange over a year (<https://wli.wwt.org.uk/wp-content/uploads/2021/01/WLI-World-March-2020.pdf>). Ralph Klein Park, Calgary and Red Ciudadana por los Humedales, Valdivia are very different: one a well-funded municipal park, the other a voluntary citizen-led network in a wetland city. They saw their differences as an opportunity to give each other novel ideas for CEPA approaches. Without a visitor centre, Red Ciudadana por los Humedales carries out wetland tours by bike and bus; it also runs an environmental leadership workshop. Ralph Klein Park's citizen science, and education programme for schools, likewise helped volunteers in Valdivia develop new approaches.

### **Animal and human networks overlap**

Islands far apart can be connected by the internet, by language, and by migratory species. Flyway networks help this. Migratory Birds for People (MBP: <https://wli.wwt.org.uk/initiatives/migratory-birds-for-people/>), in the East Atlantic Flyway, and the East Asian-Australasian Flyway Partnership (EAAFP) both organise events to engage people in their regions, especially birders and young people. Networks operate with formal mass emails, personal contact, and less formal WhatsApp groups etc. This also enables smaller, direct relationships, such as MBP members at Urdaibai and the island of Terschelling, Netherlands, who found individual spoonbills were migrating between their reserves; having met at a network meeting, they then set up video conferences between the local school children in each



*MBP map*

place.

### **CEPA networks at long distances**

*Birds & Schools* (<https://wli.wwt.org.uk/category/world-migratory-bird-day/>) connects schoolchildren in multiple countries, pegged to World Migratory Bird Day. The WLI network alerts wetland centres of the project; they in turn approach local schools. Then we establish a group of two to five schools that share language and more broadly education and age level. The children visit the wetland centre to learn about migratory birds. Later the same week, at a coordinated time, the schools connect via video conference and ask round-robin questions, share their photos, and sometimes play a video of their visit to the wetland. The children gain multiple memorable experiences: at the centre, making a video or drawing; and communicating with peers overseas during the video conference. The wetland centre can also provide follow-up course materials for the schools, to continue reinforcing positive associations with nature and to increase the level of their understanding. Often none of the participating staff have met in person, but the network's emails, video conferences, and common ground, are enough to enable an effective learning activity.



*Birds & Schools 2019*

### **Networks or Nature clubs?**

Many conservationists have been in nature clubs since childhood. Clubs can serve local engagement very well. For conservation professionals, there are benefits in acknowledging the differences between clubs and networks, and adjusting one's expectations accordingly. In particular, international networks will cover a more diverse group of people, and the more diverse group of skills and resources they bring along. When Migratory Birds for People wished to mark its tenth anniversary in 2018, it created a 1.5 x 2 metre fabric activity map, like a huge board-game, with a guide to different games and educational uses. None of the individual members alone could have delivered the whole package: funding from one centre; graphic design and printing from another; information gathering from a dedicated volunteer; and the experience of games from many. Caring for wetlands is a common language that opens contact which may otherwise be limited.

## The Invasive invertebrate Project

Natasha Stevens, Liza Fowler, Daryl Joshua & Christy Jo Scipio-O'Dean (St Helena National Trust)

Stevens, N., Fowler, L., Joshua, D. & Scipio-O'Dean, C.J. 2021. The Invasive invertebrate Project. pp 106-107 in *Staying Connected for Conservation in a Changed World: UKOTCF's 6th conference on conservation and sustainability in UK Overseas Territories, Crown Dependencies and other small island states, 2nd, 3rd, 9th & 10th March 2021 – Proceedings* (ed. by M. Pienkowski, C. Wensink, A. Pienkowski & J. Males) UK Overseas Territories Conservation Forum, [www.ukotcf.org.uk](http://www.ukotcf.org.uk)

Overview of the project: St Helena has over 420 endemic terrestrial invertebrate species and many are threatened by introduced alien invasive invertebrates. The project will facilitate endemic invertebrate recovery and re-establish their associated ecosystem functions, by testing and establishing invasive invertebrate control methods. The project focuses on the wasp *Vespula vulgaris*, key ant species (e.g. *Pheidole megacephala*) and the springbok mantis *Miomantis caffra*, while also building local capacity, embedding results and engaging people in citizen-science. This project will be a collaboration with government, local community and partners. Outcome of the project: a decline in one of the target invasive invertebrates, endemic invertebrate population recovery and the control method implemented in St Helena Government work-plans.

Left to right: Christy Jo Scipio-O'Dean, Natasha Stevens, Daryl Joshua and Liza Fowler

Natasha Stevens, Liza Fowler, Daryl Joshua & Christy Jo Scipio-O'Dean, St Helena National Trust, [natasha.stevens@trust.org.sh](mailto:natasha.stevens@trust.org.sh)



*This poster is displayed on the following page.*

### Q&A

**Owen Hallett:** Fascinating poster, and this seems like a really important project. Is the poisonous bait used specifically attractive to the target species (e.g. wasps/ants), or is there another way in which you ensure that no other invertebrates are negatively impacted?

**Josh Smith:** Really interesting poster on the invasive invertebrates of St. Helena. I'm curious to know how the poison baits are distributed & whether there are any non-target casualties?

**Jamie Males:** What's the bio-control agent that you're looking at, and how do you assess the biosecurity risk of introducing it?

**Natasha Stevens:** We are concentrating on the research only and laying the path for anyone who would like to bring in the bio-control. The bio-control agent is from a highly specialised group of Torymid parasitic wasps, the subfamily Podagrioninae, which only specifically parasitize mantis eggs. We will be working closely with St Helena Biosecurity to see if this is feasible as this would require more tests to make sure no risk is involved.



# The Invasive Invertebrate Project

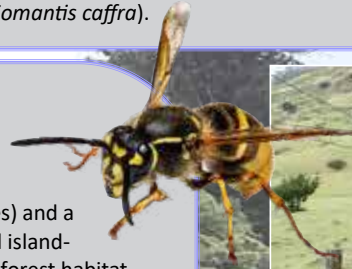
St Helena is a small remote island (47sqm) located in the South Atlantic Ocean. Despite its size, it hosts over 400 endemic terrestrial invertebrate species; it has more invertebrate species than the UK and all other overseas territories put together, making it a location of immense global importance. Many of these endemic species are under threat from invasive non-native invertebrate species. An innovative new project will facilitate endemic invertebrate recovery and re-establish their associated ecosystem functions, by testing and establishing invasive invertebrate control methods. The focus will be on the Common wasp (*Vespula vulgaris*), Big-headed ant (*Pheidole megalcephala*) and the Springbok mantis (*Miomantis caffra*).

## Why focus on these invasive species?

The **Common wasp** is a social wasp (lives in colonies) and a generalist feeder (eats any invertebrate). It is found island-wide but in highest numbers at the endemic Cloud forest habitat which hosts over 120 endemic invertebrate species alone. The common wasps are a nuisance, hinder production of fruit and honey, and present a threat to human health.

The **Springbok mantis** is a generalist feeder and is found island-wide. They are often observed feeding on other invertebrates, particularly nocturnal species that are attracted to nightlights, such as endemic moths (e.g. *Helenoscaparia nigritalis*).

**Ants** in general are a problematic insect for the island, they feed on living and dead invertebrates (including our endemics), and can destroy habitats. Ants rear pest species such as aphids which threaten native plants and reduce abundance of beneficial invertebrates such as ladybirds. The **Big-headed ant** is believed to have been one of the causes of the extinction of some endemic invertebrates, e.g. the **Giant earwig** (*Labidura herculeana*). The Big-headed ant has been known to attack chicks of the endemic **Wirebird** (St Helena plover, *Charadrius sanctaehelenae*).



Deploying wasp (beer) traps © Liza Fowler

## How we going to control these species?

The **Common wasp** will be controlled using a toxic bait (containing Fipronil). The adult wasps will carry the poison (bait) back to the nest and distribute it to the larvae and queen, after digesting the bait the wasp colony will collapse.

The **Big-headed ant** will be controlled using a toxic bait (containing Hydramethylnon). The worker ants will carry the poison back to the nest and distribute throughout the colony and die after digesting the bait.

There are no known chemical control methods for the **Springbok mantis**, however a bio-control method is being undertaken.

## Education and awareness

This is a community project that aims to increase public knowledge on the impact of invasive invertebrates, and how we can control them. You can get involved with the project by joining our citizen science activities.

Learn more about the project through local and social media, or you can contact us on:

Tel no: (+290) 22224

Email: [christyjo.scipioodean@trust.org.sh](mailto:christyjo.scipioodean@trust.org.sh)  
[natasha.stevens@trust.org.sh](mailto:natasha.stevens@trust.org.sh)  
[daryl.joshua@trust.org.sh](mailto:daryl.joshua@trust.org.sh)  
[liza.fowler@trust.org.sh](mailto:liza.fowler@trust.org.sh)



Training staff in ant surveying method © Natasha Stevens



## General Discussion on Topic 2

The general discussion started by going through the latest draft of the conclusions and recommendations relating to this topic, incorporating adjustments to address comments from earlier rounds.

**Joanna Pitt:** On 2.01, I think I heard a comment earlier that the prohibition on funding outreach using Darwin+ funds has not been lifted? Is that correct? Sorry - has NOW been lifted?

**Mike Pienkowski:** It was lifted quietly a year or two back, which we were very pleased with. It was something that we had tried to get lifted for several years, since it was introduced in 2010. So, thank you, UK Government, for that.

**Joanna Pitt:** Great!

**Bryan Manco:** Content here.

The conclusions and recommendations were agreed then without further changes.

The discussion then picked up other issues arising from earlier in the session or relating to the topic. Several points continued questions and answers on particular presentations and, for clarity, these have been transferred to the Q&A sections following those talks.

Some more general issues were raised also:

**Keith Bensusan** (as Question-master): There was a more general question I wanted to raise, which I alluded to earlier, after John Pinel's talk. We have a contrast between John's statement in his talk that nature should not be viewed as a commodity; its value is beyond calculation, and Jake's talk. These sessions always include talks on economic valuation of natural resources, which I think is important and useful. But I agree with John it seems totally alien to what most of us here would feel about the natural world, which is really visceral and driven by emotion. So, the question would be, in the end: is our best bet to achieve our objective to appeal to the heart or to the mind of those that do not feel the way that we do about nature?

**Jake Kuyser:** Communication and the narratives that we use are certainly one of the biggest issues. I am an economist and I work with other economists and we talk to each other about the numbers and the concepts, so when we go to present the data, if one does not use concepts that resonate with people, they quickly lose interest. Mostly, we are trying to communicate this to practitioners, people who work in environment departments or statisticians, so they already have some familiarity with these concepts. If we take that and try to engage average people on the street, whether they are interested or not, this can become quite challenging. These issues are quite complex, and you do need a bit of specialist background. It just does not resonate; if you take more than 5 minutes to explain a topic, then you have lost people. We produce these numbers, economic values. In some of them, you get quite big monetary values which excite people, and that is what gets picked

up in the media. This is quite a disservice because it is detached from the actual purpose of understanding the economic value and understanding what is driving it – how the environment underpins the economy, what the dependencies are, and at the very end you build up to this value. But it does not tell the whole story and so I think it is an open question. It is one of the most important things that us, as practicing economists, are trying to do. You can see things like the Dasgupta Review starting to pick up on some of these concepts, and it is starting to filter into the more common discourse, that's encouraging. But there is still certainly a long way to go. Trying to find the right language in which to talk to people is critical at this point in time.

**John Randall:** I think the point is that it is like a conversation earlier on terminology: horses for courses. I can tell you a little about how the Dasgupta Review came about because I was in No. 10 [the UK Prime Minister's Office] when we persuaded the Treasury to commission it. The reason for this was that the Treasury was tending to, as treasuries do, was acting a bit like your parents. We say 'can we have something for a new policy' and they say 'no, you're not old enough' or 'we can't afford it' or whatever. A few of us decided, with the help of the Director-General of ZSL, that we want the Treasury to realise that there is an economic, as well a moral, reason why we should not have a loss of biodiversity. For some people, and for a lot of UKOTs and other nations around the world, it is obvious why loss of biodiversity would be a bad thing economically: loss of reefs and tourism is a good example. It was also to show that it would also make a difference to those people who say 'if we lose a couple of species, so what?' There are plenty of others. Wouldn't these go extinct anyway?' I am in the camp which says that biodiversity is so important – and has been all my life – but I have to recognise that there are a lot of people who do not feel it in the same way. So, showing why the loss of biodiversity actually affects everybody is to do exactly what the Stern Report did for climate-change: it wasn't just a matter of people saying 'Oh, it's actually going to be a bit warmer'; it's actually what happens, the real effects. So that's why I think it is important. Thanks for letting me come in there; you can see I used to be in politics.

**Mike Pienkowski:** I am not sure about the "used to be"! I see there is a question in the chat-box from **Gordon Steele:** In advance of CoP26, will UKOTCF be able to help with some well worked responses to the usual points made about the environment, including: the CDs/UKOTs are too small to matter – we'd better wait until China stops burning coal and Covid has drained all our budgets; there is nothing left for nature. There are a whole series of these myths and they get repeated by politicians and social media. Perhaps they need pithy, sharp, short takedowns?

**Mike Pienkowski:** I would turn the question around

in a way, and say that some of the territories are doing remarkable things in terms of cutting down our emissions and so on. It would be more a matter I think of saying ‘look at these examples; if these little places can do it, why can’t these big administrations do it too?’ I think that this could be a very positive way of addressing that.

In this brief gap, could I also apologise for an omission when I stepped in at the start of this session, and draw attention to the posters linked to this session [and he named the two in particular].

**John Pinel:** If I could come back on the valuation aspect, I wasn’t arguing against valuation, because it is very important to talk in economic terms about the cost of some of these things. I’ve just looked up the value of pollination services worldwide, something that has been mentioned a lot. The INRA and CSRS French scientists and UFZ German scientists (on a website called *Science Daily* from a paper published in the Helmholtz Association of German Research Centres) found that worldwide economic value of pollination service provided by insect pollinators, bees mainly, was €153bn in 2005 of the main crops that feed the world. So there’s a really big number that says ‘Yes: insect pollinators are really important’ but my issue is about the commodification of nature, because when you put a price on pollination, the implication is that, for a price of €153bn, we can afford to lose bees because we can replace that service. But I think that the issue is: if you lost insect pollinators from the planet, you would see this massive trophic cascade of small mammals, birds and everything else along with it, and the wild plants and crops which no longer propagate – and we are all finished without insect pollinators. That’s my issue with economic valuation; it’s not talking about nature in economic terms; it’s commodifying nature, implying that it can be replaced – because it can’t. You cannot value a rain-forest, for instance, because you could not possibly account for the value of the bacteria or the fungi which exist in that forest, even if you can value the standing wood and its timber, and you can chuck in a few pound for the birds etc. It’s not the discussion of nature in economic terms that I am concerned about; it’s the commodification of nature; and I can see this more and more coming, with people like the World Economic Forum and the World Bank talking about it a lot more, WWF are talking about it these days because it is a way of engaging with the economists, which we have to find ways to do. But I just find the gap between the cost and the value is enormously great. Jake was mentioning earlier that it is imprecise, but what is the value of a bacteria; I don’t know that we could ever put a price on that.

**Jake Kuyser:** I absolutely agree with all that. It’s partly the point I was trying to make about how we are trying to talk about these things. I often get misquoted, for example, if we say the economic value of something is such and such, that to me and to most economists is something very different from saying the price of something is that. But when those numbers get picked

up – and I have actually had this in a newspaper article and headline – as we ‘say the price of this service is...’ This misses the point, by using marketing terms. No matter how much time I try to explain to somebody what we mean by economic values, that we are trying to make linkages and understand how the environment underpins other types of values etc, they will still only hear ‘the price of this is such-and-such.’ That’s how we risk the sort of problems of commoditisation that John mentioned.

*Keith Bensusan picked up an issue from the the questions after Andrew Dobson’s presentation:*

**Peter Richardson:** Are you able to measure, record and publish any public well-being benefits to the development and maintenance of these spaces?

**Andrew Dobson:** Probably, the answer at the moment is no. We haven’t published anything, but I would welcome your suggestions because, as has been pointed out, if you could show the public benefit, then that might help with future campaigns and fund-raising. We can see the benefit of getting school groups into there as part of the education programme; that is a benefit, which can be measured in pupil numbers, but we have never done a count of persons using it or any survey as to how they feel about their experience of that particular reserve. Perhaps that is something we should do.

**Joanna Pitt:** The Vesey Reserve was featured in a geocaching tour that promoted exploring nature reserves to locals and tourists alike. It was also a major stop on a recent ‘socially distanced’ scavenger hunt organised by the Bermuda Zoological Society. Schools use Pitman’s Pond for science classes. These sites are definitely used. I don’t think this is being documented with a view to publication though.

**Keith Bensusan:** Thank you Joanna

**Peter Richardson:** Thank you Joanna - was just thinking that by measuring changes to public well-being associated with use of these places there would be yet another strand of evidence to support justification and funding of more rewilding on island.

*John Pinel then picked up a question on school link from after Lord Randall’s presentation and that discussion is incorporated there.*

**John Pinel:** Any other points, Keith, from the chat-box that we should pick up?

**Keith Bensusan:** John, there is one from **Gordon Steele** which I suppose Mike might be able to tackle; Gordon says: In advance of CoP 26, will UKOTCF be able to help with some well worked responses to the usual points made about the environment, including that the CDs/UKOTs are too small to matter and that we had better wait until China stops burning coal, and Covid has drained all our budgets; there are a whole series of these myths and they get repeated by politicians and social media. Perhaps they need pithy, sharp, short takedowns. Mike?

**Mike Pienkowski:** Well, thank you. I have answered this in part in the chatbox [pp. 108-109], but can add

something. I am not going to volunteer my colleagues to do anything because I get told off by taking things on with no resources with which to do them – which seems to be what we are doomed to do at times. However, it is an interesting point and the one to which I was alluding earlier in the discussion. There are some very good arguments to be made here, more on the lines of looking at what we are already doing in the territories and what has actually been done in this area in individual territories and in some cases linked up. This should be used more to say look how we are doing these things; look at what we are doing. If we can do it, then you bigger places with more resources can do it as well. I think it would be worthwhile pulling that together. Let me confer with my colleagues before we actually say that we would do that – but, equally, the Forum isn't just our core group at the centre, trying to keep the show on the road. It is actually all of us. We may be able to share that task out, by all means with UKOTCF trying a sort of coordinating role, using its contacts and networks.

**Mike Pienkowski:** Looking at the time now, John, I think we should start to draw things to a close for the day. We have had some very good discussions and people are getting a bit tired. I also noticed – and I guess that it was the same for all of us – that, during John Randall's presentation, that we were actually losing picture-sound synchrony. This was certainly not because of the original recording, which is fine. I suspect that people were turning Netflix and the like on after dinner or something and we were competing for internet resources. Or, calculating the time-zone differences, perhaps people in warmer climes further west were turning things on for a little bit of break after lunch. But we seem to have overcome those challenges.

I am also impressed how many people stayed into what, on this side of the Atlantic is a late-night discussion session – but, for anyone, we are near the end of about 8 hours of meeting. We spent a lot of time earlier working out what schedule to use on this; we were in an online meeting of another organisation which I worked out was running 16-hour days – which I thought was a little over-the-top, although I survived it. People have certainly fared very well at this conference.

I want to take this opportunity to thank all the speakers and everybody helping them put things together, and the poster-people as well, whom we mustn't forget. Obviously the colleagues on the topic panels, including those people whose arms I have twisted – and sometimes had to drag in – to do roles like chairing, question-mastering, rapporteuring and so on: if we spread the load, it all helps – and, of course, my colleagues in the organising team. Just occasionally you could see that we were running around frantically. Actually, for the entire time we were running around frantically, but I think that we managed to disguise quite a lot of it. That's what you get when you're organising conferences.

I want to remind everybody that we will be starting again at noon tomorrow and that we will attempt to make this thing live at least 5 minutes before noon, because it takes a finite time for everyone to join in, once we have released that. Could I ask you to pass messages to colleagues? Booking is a complex process, but there are reasons for it. I examined it quite closely to see if we could short-circuit it: you have to book; then you need to register; and you need to leave it so the registration is approved so that you get the joining messages. We know also that some emails are not getting through servers. We have suffered this a lot: several servers have blocked emails from ukotcf.org addresses and some of them have blocked pienkowski.org addresses too – and we do not always receive 'bounce' messages when this happens. Why anyone thinks that I am a subversive, I have no idea! I suspect that the cause is a sort of conspiracy by hotmail, gmail and the like, thinking wouldn't it be nice in everyone were on our system, so that we can acquire their data. Anyway, these blockages can occur even if emails had been getting through without problem earlier – and we know that this affected at least one of the team members today.

If any of you know colleagues or other people who think they have booked but not received connection links, or have not received anything else that they should have done, do tell them to contact us. There is no harm in copying them the links to register; these are effectively public. It is the next stage which needs approval, so that they get the individual connection link. I hope that everyone has their PDF document, or at least one of various revisions. If they haven't, these can be forwarded too, or contact us. Essentially, if you or your colleagues haven't got anything that you think you should have, please get in touch tonight or tomorrow morning. Once we get to about 11am GMT, it becomes almost impossible to deal with those as we set up and run the day's sessions. We have actually been trying, in the programme gaps, to check that there is nobody waiting for approval but if you are actually doing a job like being the technician sharing screens, or are attempting to chair or be question-master, it is difficult to break away to do that.

Thank you everybody for persisting through all that. I think, as we get to 19:59 on my clock, probably it's time to say night. So, good night or good afternoon everybody. Please, everybody, join us tomorrow: you're all welcome. I think that we can take a second day of this before having a few days off from the conference. There is a very interesting programme tomorrow as well as today. So, that's it folks; good bye for now.

**Christine Rose-Smyth:** Thank you all for a stimulating day!

**Shakira Christodoulou:** Thanks everyone and goodnight! See you tomorrow!

**Gordon Steele:** Superb day!