

## **Remembering Dr Ben Collen (12th February 1978 – 19th May 2018) – an exemplary conservation biologist.**

Dr Ben Collen was a conservation biologist known for establishing science-based indicators to track biodiversity trends and employing them to inform global conservation policies. He died on 19<sup>th</sup> May 2018, shortly after his 40<sup>th</sup> birthday following a bone cancer diagnosis just 15 months earlier. He tackled his illness with the same attitude that characterized his work, always being positive, open, creative and with great good humour.

Ben was born and brought up in Norfolk, England. He spent his final school years in Italy – giving him the first of many international experiences that he valued highly. His undergraduate degree was in Biology from Imperial College London. He then spent a year in East Africa supporting field projects on large mammals. He enjoyed the experience enormously and it led him to seek a career in animal conservation. He took a masters degree at the University of York and during his research project, based at the Institute of Zoology (Zoological Society of London), he found himself at home among a like-minded set of conservation biologists developing quantitative approaches to species conservation. Ben stayed on at the Institute of Zoology to do a PhD working with Georgina Mace and Andy Purvis at Imperial College. His research was on patterns in mammalian extinctions and he published his first paper in 2004 (Collen et al. 2004). In 2005, with his PhD completed, Ben joined the newly formed Indicators and Assessments Unit at the Institute of Zoology working with Jonathan Baillie. His first task was to re-launch the most widely used indicator of wildlife population trends – the WWF Living Planet Index (LPI). Ben built up a large team and massively enhanced the underlying data and rigour of the analysis, putting the LPI onto a much firmer footing (Collen et al. 2009). He collaborated with other conservation data centres and his work was a key contributor to the landmark assessment in 2010 of the state of global biodiversity (Butchart et al. 2010), along with many other biodiversity assessments.

In 2013 Ben moved to University College London to join the newly-formed Centre for Biodiversity and Environment Research (CBER), again working with Georgina Mace. He embarked on his research career at UCL with his characteristic energy, whole-heartedness, good humour and intellectual curiosity, and quickly built a large and energetic research group, including diverse field and computational projects. He attracted a lively set of graduate students and won large grants amid a growing network of collaborators. Ben also transformed undergraduate field ecology, developing new courses at UCL's field centre at Blakeney Point in Norfolk. Ben thrived in the academic environment of UCL. In 2015 he was awarded the ZSL Marsh Award for Conservation Biology and was promoted to Reader. Everything was going well and we were all looking forward to the next steps in his career when it was so cruelly cut short.

Ben's research focussed on strengthening conservation practice through developing stronger scientific and theoretical underpinnings, but with a significant dose of pragmatism and clear thinking. His approach was realised through several different but interconnected strands. One element was to support the ongoing assessment of species with the IUCN Red List of Threatened species criteria, building on efforts to expand the coverage of taxonomic groups, in particular of under-studied groups such as reptiles (Böhm et al. 2013) and invertebrates (Dirzo et al. 2014) and undertaking his own field work on penguins, and his favourite species - the pygmy hippo (Collen et al. 2011). He also took an interest in under-represented regions such as Central Asia, for which he led an analysis of vertebrate extinction risk using regional red lists (Collen et al. 2006).

Ben was central to developing the scientific underpinnings of biodiversity indicators that made them more robust, reliable and useful for conservation. Previously, measures of the state and trends in biodiversity were often haphazard, disorganised and idiosyncratic, with different countries, scientists and practitioners using different measures based on patchy data sources. Through his PhD and later in his roles at ZSL, Ben combined theory, quantitative methods, and pragmatism to strengthen biodiversity indicators such as the Living Planet Index and Red List Index (Baillie et al. 2008; Collen et al. 2009). He did this with patience and charm, building trust with fellow ecologists so that they were willing to submit their data to global databases (no mean feat), enabling a picture to be built of the changes occurring in our natural world.

Ben's capacity to understand conservation's knowledge needs and act personally to fill these gaps inspired an agenda to improve the information base underpinning global biodiversity policy making. He took a long-term view, investing several years into making the RL and LPI databases into the comprehensive and powerful tools they now are. This was a brave move, career-wise, at a relatively early stage in his academic career, when quick wins and high profile publications are needed in order to gain a reputation and secure a tenured position. It was also a very unselfish thing to do, because the time he spent in developing and populating these databases was for the benefit of the many others who are now using them both for scientific research and to inform and drive international and national policy and practice.

Not satisfied with indicators simply playing the role of illustrating that biodiversity was largely in decline (Butchart et al. 2010), Ben's focus turned to how indicators can support policy and management decisions (Collen & Nicholson 2014). This included strong alignment between conservation targets and the indicators used to report progress, but also the use of indicators with models, both to evaluate actions needed to achieve targets under a range of scenarios, and to test the indicators themselves (Jones et al. 2011; Nicholson et al. 2012; Costelloe et al. 2016). This new predictive approach saw a shift in the purpose of global biodiversity indicators to become tools for informing better policy decisions, rather than simply recording the failure of previous policy choices.

Throughout his career, Ben not only changed the way that science was done, but the lives of those he worked with. He had many wonderful characteristics - his charm, his intellect, his unflappability, and his delightful sense of humour. He was a natural, effortless leader and a wonderful colleague. He was always generous with his time and ideas, and unlike too many people at the same career stage, he seemed to have his work-life balance well under control.

Ben was unfailingly patient and respectful with his students and peers, made everyone feel valued and could always be relied on to bring out a laugh in times of stress. He managed a large team of interns working at the Indicators and Assessments Unit, for most of whom this was their first foray into professional conservation science. EJ came into contact with many of them as they entered postgraduate study after their internships. They unfailingly spoke of how Ben had supported their personal development, taken an interest in them and made the (fundamentally quite boring) task of searching the literature for data and entering it into the databases a fulfilling job that taught them about how conservation science is done. It was a brilliant foundation for their future careers.

As one example of Ben's way of working and personal generosity, he found ways to come to visit Emily in Australia to continue their collaboration, knowing that with small children, it was very difficult for her to make it to the UK. When he was invited to write a perspective article for *Science* in 2014, with the option of bringing in another author, with great generosity he asked Emily to co-author the article with him (Collen & Nicholson 2014). As a postdoc at the time, working part-time and having just returned from maternity leave, this was a career changer – Emily has no doubt that Ben recognised this, but he simply told her that he did not trust himself to write it alone.

The number of people Ben influenced is vast; conservationists across the world have mourned his loss – a surprising reach for someone so relatively early in his career. Ben was taken from us, and from his family, cruelly early. He leaves behind his wife Alanna and baby daughter and all our sympathies go out to them.

We will all miss him terribly. But Ben's legacy will be seen for many years, not only through his scientific work and other material and intangible outputs, but also in the lives, careers and ways of working of his students and others he influenced. He stands as a model for managing an academic career in conservation biology that is not only effective and enjoyable, but also generous and kind.

Georgina M. Mace, University College London

EJ Milner-Gulland, University of Oxford

Emily Nicholson, Deakin University

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