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Author(s): David Samways
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Editorial introduction – special issue: biodiversity

David Samways – Editor

The focus of this issue of the JP&S is biodiversity. While anthropogenic climate change has become the dominant issue in public environmental discourse, and is increasingly recognised as an existential risk, loss of biodiversity has received less public attention (Veríssimo, et al. 2014; Legagneux et al., 2018). Indeed, climate change has come to so dominate discourses about human environmental impact that rather than being seen as just one of many impacts it is sometimes employed as a *synonym* for environmental impact per se, with the implication that solving the climate change problem solves all other environmental problems. However, while climate change is undoubtedly an urgent and critical issue, the wider human impact on the earth's ecosystems may represent as great, if not a greater, risk (Ehrlich and Ehrlich, 2012) that will not vanish once anthropogenic carbon emissions have abated. Climate change is itself an important driver of species extinction, but it is only part of the story; as the contributors to this issue attest, in general, it is the sheer size and extent of human activity that is driving species extinction. The 2019 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reported the main drivers of species extinction as: land-use change and the direct overexploitation of animals, plants and other organisms; climate change; pollution including the introduction of invasive alien species; human population growth and economic growth (IPBES, 2019).

Legagneux et al. (2018) report that between 1991 and 2016 climate change received up to eight times more media coverage than biodiversity, a finding that they argue cannot be explained by differences between the number of scientific papers published or the level of research funding. They identify a number of reasons for this discrepancy including the fact that the causes, consequences and possible solutions to climate change were simpler to communicate than the more

complex and diverse dimensions of biodiversity loss and its consequences for human beings.

> Attempts to reduce global warming can easily be summarized as any action that will limit it to 1.5 or 2°C. However, there is no clear biodiversity benchmark to meet that can easily be translated to policy. (Legagneux et al., 2018 p.4)

Climate change is frequently regarded as an essentially technological problem, which has, as with almost all previous environmental challenges, technical solutions. While potential policies to reduce national carbon footprint entail a range of social changes to reduce consumption as well as technical fixes, it is the latter in the form of transitions to low and zero carbon technologies that grasp public attention. Policies built around these technical fixes have obvious attractions to politicians too since they hold out the hope of mitigating climate change without either having to attempt to change their constituents' behaviour by intervening in choices previously regarded as entirely personal and self-regarding (e.g. what people eat, the size of their family, etc.), or moving to an alternative economic model. Such a view sees technological progress, in the form of greater efficiency, renewable energy, energy storage systems, new technology for increased agricultural production, carbon capture and storage (CCS)[1] and so on, as the solution to our environmental problems. However, while these technical fixes are essential to curbing carbon emissions they are unlikely to meet IPCC targets if we do not simultaneously address consumption - of which population growth is an important multiplier. Moreover, and perhaps most significantly, the dominance of climate change in public environmental discourse has eclipsed other more apparently intractable and possibly more critical problems, the foremost of which is loss of biodiversity and species extinction. One reason for this may lie in the fact that loss of biodiversity, as the recent IPBES report shows, has so many causal factors that no simple technical fixes analogous to those for decarbonising of the economy appear to be available.

The Norwegian eco-philosopher Arne Naess characterised mainstream environmentalism as "shallow ecology" since its aim was to:

1 Indeed the 2016 Paris UNFCCC agreement on climate change relies on as yet unsubstantiated CCS technology and systems to achieve the zero emissions target by 2060–70.

> Fight against pollution and resource depletion. Central objective: the health and affluence of people in the developed countries. (1973 p.95)

One does not have to subscribe to Naess' "deep ecology" to concur with his general observation that a significant part of environmental concern has largely been oriented to these narrow anthropocentric objectives. The recent growth in environmental concern, while dominated by the "climate crisis", has also included anxieties about the fate of other species, much of which might be attributable to the "*Blue Planet* effect"[2] (Gell, 2019). Environmental concern is at the highest level ever recorded (Smith, 2019). But does this represent a clear indication that narrow anthropocentrism is being softened and that people might be open to significant changes in lifestyle and curbs on their personal autonomy to protect the environment? A brief overview of the history of environmental concern shows shifts in attitudes but also little appetite for bearing the cost of action.

Arguably, the environmental movement, and indeed popular environmental consciousness, as we know it today began in the 1960s with the serialisation in *The New Yorker* of Rachel Carson's *Silent Spring* (1962). Carson's focus was on the effect of pesticides on what we would now call biodiversity, a term only coined in the mid 1980s, but the movement she inspired went beyond this to mobilise against the impact of anthropogenic pollution in general on the natural world. However, in contrast with many environmentalists, much of the general public's concern with the environment, as in earlier times, myopically focused on the shorter-term consequences of such pollution for themselves, their families and communities. In the developed world, public concern about environmental degradation was largely pacified by regulatory measures and technical fixes which cleaned up the most obvious local pollutants or shifted them elsewhere. Over the next half-century or so the environment waxed and waned in the anxieties of the general public, arguably mirroring the ups and downs of the economy (Kahn and Kotchen, 2011; Scruggs and Benegal, 2012). However, during this time the longer-term and global nature of human environmental impact flagged up by books like the Club of Rome's *Limits to Growth* (Meadows et al., 1972) slowly seeped into public environmental discourses, and latterly the issue of climate change with its global scope and impact on future generations has taken centre-stage.

2 BBC television's Blue Planet II first broadcast on 29 October 2017 highlighted the impact of plastic pollution.

It might be argued that this transition from a local and short-term focus to a global and long-term one represents a paradigm shift in public environmental consciousness. However, a number of studies show that despite this broadening of scope and the currently very high levels of concern, local and short-term environmental issues such as water and air quality are of at least equal importance in people's minds (IPSOS, 2018; McCarthy, 2019). Moreover, although survey data shows that people are genuinely concerned about the plight of other species and biodiversity (see for example European Commission, 2015), evidence also indicates that issues such as wildlife conservation can rank well below climate change, air pollution and dealing with waste (IPSOS, 2018). The results of survey data and polls need to be treated with some degree of caution since attempting to get a firm handle on public attitudes to the environment is extremely difficult. Media coverage of particular issues at particular times, such as plastic pollution, has a massive influence on public perception of the importance of an issue in terms of its overall environmental impact (Henderson, 2019). Moreover, where it comes to individual behaviour, people are obviously much more likely to engage in an action that is easily achieved without personal cost (be it monetary, time, convenience or personal autonomy), like declining a plastic carrier bag, than more fundamental and costly changes to their lifestyles such as eating less meat, driving fewer miles or taking fewer flights[3] (see Taylor, 2012; Alcock et al., 2017; Fisher et al., 2018; Hill, 2019). Moreover, a number of studies have shown that personal experience of extreme weather events increases concern about climate change and also increases the likelihood of changing personal behaviour (Spence et al., 2011; Broomell et al., 2015; Demski et al. 2017). Such studies indicate that threats that are far-off in time and space are unlikely to motivate significant behavioural change until the effects are immediately obvious and costly.

Despite these caveats, it is clear that the environment has become a narrative that is an important dimension of public discourse – with the 2019 UK general election attesting to this. However, it is also clear that these high levels of anxiety are not only fairly readily eclipsed by other factors such as economic recession or security issues (Scruggs and Benegal, 2012; Taylor, 2012), but are also still primarily concerned with human well-being. The picture is made more complex since this relatively narrow anthropocentrism is tempered with a genuine interest in the fate

3 Notably, the question of having fewer children to save the planet has yet to make it onto the pollsters' questionnaires.

of other species – even if this has largely been with those that people find most appealing. Whether this concern with the condition of nature can be elevated to the same level as that of climate change is yet to be seen. Where it comes to concrete action, the public still has great faith in technological solutions and is resistant to restrictions to their personal autonomy. Technology will play a critical role in mitigating climate change, but without also simultaneously addressing the two other terms in the IPAT equation (impact = population x affluence [consumption] x technology) the existential threat of ecological collapse will remain.

When it comes to species extinctions, public concern has largely been focussed on the so-called 'charismatic' vertebrate species such as the giant panda, tiger, rhino, elephant, leatherback turtle, birds of prey and so on. In the first paper in this issue, Fred Naggs draws on his extensive knowledge of land snails (probably counted by most as amongst the least charismatic of animals) as barometers of biodiversity to illustrate the contrasting effects of population growth on the islands of Madagascar and Sumatra. Naggs points out that while public concern about vertebrates is legitimate, invertebrate extinctions are massive and particularly worrying since they are part of the ecological foundation on which creatures higher up the food chain are reliant. He writes: "If we are concerned about biodiversity loss then their story needs to be told and their fate needs to be a focus of our attention." Examining the islands of Sumatra and Madagascar individually, Naggs concludes that the driving forces of biodiversity loss in each are a product of endogenous and exogenous factors. In the case of Sumatra exogenous demand for natural resources has been the major factor, while in Madagascar it has been endogenous population growth that has led to deforestation and ecological destruction. Naggs finds conservation responses to the developing anthropogenic mass extinction wanting. He argues that the objective of 'sustainable development' has subordinated and compromised conservation programmes. But in particular Naggs finds that the notion of 'sustainable development' fails to address the combination of overconsumption and overpopulation as the ultimate drivers of the sixth mass extinction. Given the pace of species loss, Naggs argues that there is an urgent need for a zoological species inventory. While technology cannot halt species extinctions, the preservation of biological material offers the technological means of underwriting traditional conservation and may offer the possibility of species restoration if future environmental conditions permit.

Like Fred Naggs, Freya Mathews is critical of the notion of 'sustainable development'. In our second article she examines how the concept of biodiversity conservation has unwittingly been complicit in the expansion of human numbers and the decline of populations of wild species. She begins with the observation that anthropocentrism, or human-centeredness, has been the organising principle of global developmental modernisation enabling the growth of human numbers and ecological footprint leading to the ever-greater "annexation" of the habitats of wild species. Mathews suggests that the shift from the concept of 'wilderness' conservation, which contained a moral pushback against anthropocentrism, to the conservation of 'biodiversity' entailed an unintended contraction of scope so that conservation became popularly understood as the prevention of species *extinctions*. Thus, rather than enabling the flourishing of species populations, conservation was only triggered by critical endangerment of particular species that fell below 'minimum viable populations' – ones which were only a fraction of their pre-disturbance numbers. The eventual mutation of *viable* populations into *sustainable* populations permitted further modernisation and industrialisation clothed with a veneer of 'sustainability' in terms of biodiversity. This validated human populations in the billions while accepting wild species populations at minimal levels. For Mathews, biodiversity conservation is clearly self-defeating and requires replacement with a concept that protects earth-life in its own right beyond anthropocentric concerns. While biodiversity, she argues, is a necessary but not sufficient condition for the flourishing of earth-life, proliferation and abundance is also necessary for optimal and ecologically proportional species populations. Mathews refers to the latter as *bioproportionality* and is a principle which requires humankind to allow species to optimise their populations in accordance with their inherent ecological dynamics. However, it follows that humankind must also optimise our own numbers in ecological proportion with those of other species, which, Mathews argues, requires a massive consensual or incentive-driven reduction in human numbers.

Articulating similar themes to Freya Mathews' paper, Philip Lymbery focuses on how the growing footprint of humankind's food system has marginalised wilderness and wildlife contributing to the creation of the Anthropocene. Critically, he shows that the huge populations of animals kept for food has a direct effect on biodiversity. More than 27bn domesticated animals are living at any one time with more than 65bn slaughtered for meat every year (Ritchie and Roser,

2017). And these numbers are growing rapidly, with population growth, rising incomes and urbanisation as the driving forces (WHO, ND; Godfray et al., 2018). Supporting an ever-increasing and more affluent human population, agriculture has crowded out wilderness until it now only represents a fraction of the earth's land area. Intensification of livestock production in factory units rather than in open farmland has gone hand-in-hand with the industrialisation of the production of crops used to feed them, which in turn has led to the destruction of habitats and loss of biodiversity. Moreover, Lymbery warns that "the way we produce food alone could take us to the brink of catastrophic global heating".

To achieve a sustainable global food system three factors must be addressed: the level of meat consumption, the method of production, and the size of the human population[4]. All three require programmes of action dealing with underlying drivers: for population reduction these include poverty, poor education, and inadequate access to contraception. Reducing consumption of animal-based foodstuffs requires governments and food businesses in the high-consumption regions to lead the transition by encouraging adoption of a greater proportion of plant-based foods and the setting of targets to reduce the proportion of meat and dairy products consumed. Lymbery calls "on the United Nations to forge a global agreement to create a regenerative food system without factory farming and excessive meat production". With fewer humans consuming smaller amounts of high-quality meat, factory farming can be abandoned and animals returned to the pastures. Lymbery argues that returning to mixed, rotational agriculture brings a host of environmental benefits including increases in biodiversity.

While the previous articles have primarily focused on biodiversity loss, Philip Cafaro and Frank Götmark's paper examines the impact of immigration, and consequent population increases, on both climate change and biodiversity policy objectives of the individual nation states of the European Union (EU) and the region as a whole. They argue that there is a shared implicit assumption amongst environmental groups and the EU policy community that "*population size and immigration rates have no important roles to play in the efforts of EU nations to meet their environmental challenges and create ecologically sustainable societies*". Examining projected European population growth under five

4 These factors map nicely onto the I=PAT equation mentioned above: environmental impact of the food system = human population x meat consumption x technology of food production.

immigration scenarios, they establish that relatively small annual changes in the rate of immigration have the potential to accumulate into large overall differences in population in the relatively near future. Applying these demographic scenarios as multipliers of three possible trajectories of per capita greenhouse gas (GHG) emissions, Cafaro and Götmark demonstrate that "in every case, increased immigration leads to larger populations, which in turn lead to smaller decreases in total GHG emissions, in individual countries and in the EU as a whole". Similarly, population growth has negative effects on biodiversity, although they admit this is more difficult to quantify than for GHG emissions as the relationship between population density and biodiversity is complex and they are therefore unable to show the effect of their five population scenarios. However, using a number of different examples they make a convincing case to show that the pursuit of policies designed to preserve and enhance Europe's biodiversity is made all the more difficult with an increasing population. They state: "while the complexity of the phenomenon prevents us from affirming a strict 1:1 inverse relationship [between population density and biodiversity], the overall trend is clear: greater human numbers reduce biodiversity". Cafaro and Götmark conclude, therefore, that the implicit assumption is false and that population growth through immigration represents a serious impediment to the realisation of both GHG and biodiversity policy objectives.

We close with Herman Daly's thought provoking review of Bill McKibben's *Falter: has the human game begun to play itself out?* – a book that counters the Panglossianism of writers like Steven Pinker without losing a degree of optimism and a sense that resistance to the dangers humankind faces is possible.

References:

Broomell, S.B., et al., 2015. Personal experience with climate change predicts intentions to act. *Global Environmental Change*, 32 pp.67–73.

Carson, R., 1962. *Silent spring*. New York: Houghton Mifflin Company.

Demski, C., et al., 2017. Experience of extreme weather affects climate change mitigation and adaptation responses. *Climatic Change*, 140, pp.149–164.

European Commission, 2015. *Special Eurobarometer 436: attitudes of Europeans towards biodiversity.* [pdf] European Commission. Available at: <http://ec.europa.eu/environment/eurobarometers_en.htm> [Accessed 20 March 2019].

Ehrlich, P. R., & Ehrlich, A. H. 2012. Solving the human predicament. *International Journal of Environmental Studies*, 69(4), pp.557–565.

Fisher, S. Fitzgerald, R., Poortinga, W., 2018. Climate change. Social divisions in beliefs and behaviour. In: D. Phillips, J. Curtice, M. Phillips, and J. Perry, eds. 2018. *British social attitudes 35.* London: The National Centre for Social Research. pp.146-171.

Gell, F. 2019. The Blue Planet effect: the plastics revolution is just the start. *The Guardian,* [online] 25 March. Available at: <https://www.theguardian.com/commentisfree/2019/mar/25/plastics-revolution-marine-life> [Accessed 27 November 2019].

Godfray, H.C.J., et al., 2018. Meat consumption, health, and the environment. *Science,* [e-journal] Vol. 361, Issue 6399, eaam5324 DOI: 10.1126/science.aam5324.

Henderson, L., 2019. *Sociological perspectives on plastic pollution*. British Sociological Association. [online] Available at: <https://www.britsoc.co.uk/about/latest-news/2019/march/sociological-perspectives-on-plastic-pollution/> [Accessed 27 November 2019].

Hill, L., 2019. *Aviation Index 2019 - public attitudes towards aviation in the UK.* Paris: IPSOS Mori. [online] Available at: <https://www.ipsos.com/ipsos-mori/en-uk/aviation-index-2019-public-attitudes-towards-aviation-uk> [Accessed 27 November 2019].

IPBES, 2019. *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.* [pdf] Bonn: IPBES secretariat. Available at: <https://ipbes.net/system/tdf/ipbes_7_10_add.1_en_1.pdf?file=1&type=node&id=35329> [Accessed 17 November 2019].

IPSOS, 2018. *Global views on the environment – 2018.* [pdf]Paris: IPSOS. Available at: <https://www.ipsos.com/sites/default/files/Global_Views_on_the_Environment.pdf> [Accessed 25 November 2019].

Kahn, M. and Kotchen, M., 2011. Business cycle effects on concern about climate change: the chilling effect of recession. *Climate Change Economics*, Vol. 2, No. 3 pp.257–273.

Legagneux, P., et al., 2018. Our house is burning: discrepancy in climate change vs. biodiversity coverage in the media as compared to scientific literature. *Frontiers in Ecology and Evolution,* [e-journal] 5:175. doi: 10.3389/fevo.2017.00175.

Meadows, D.H., Meadows, D.L., Randers, J. and Behrens, W.W., 1972. *The limits to growth*. Washington DC: Universe Books.

McCarthy, J. 2019. *Climate change concerns higher in the northeast, west U.S.* Gallup [online] Available at: < https://news.gallup.com/poll/248963/climate-change-concerns-higher-northeast-west.aspx> [Accessed 25 November 2019].

Naess, A., 1973. The shallow and the deep long-range ecology movements: a summary. *Enquiry,* 16, pp.95-100.

Ritchie, H. and Roser, M., 2017. Meat and dairy production. *Our World in Data.* [online] Available at: <https://ourworldindata.org/meat-production> [Accessed, 21 November 2019].

Scruggs, L. and Benegal, S., 2012. Declining public concern about climate change: can we blame the great recession? *Global Environmental Change*, 22, pp.505–515.

Smith, M. 2019. *Concern for the environment at record highs*. YouGov. [online] Available at: <https://yougov.co.uk/topics/politics/articles-reports/2019/06/05/concern-environment-record-highs> [Accessed 25 November 2019].

Spence, A., et al., 2011. Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change,* [e-journal] https://doi.org/10.1038/nclimate1059.

Veríssimo, D. et al., 2014. Has climate change taken prominence over biodiversity conservation? *BioScience* 64, pp.625–629.

WHO, ND. *Global and regional food consumption patterns and trends: 3.4 Availability and changes in consumption of animal products.* https://www.who.int/nutrition/topics/3_foodconsumption/en/index4.html.