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CONFRONTING HUMAN SUPREMACY IN DEFENCE OF THE EARTH



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Got nitrogen? On the links between nitrogen pollution and overpopulation

Eileen Crist

Eileen has written and co-edited numerous papers and books, with her work focusing on biodiversity loss and destruction of wild places, along with pathways to halt these trends.

Keywords: agriculture; limits; overpopulation; societal change; sustainability

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All the articles in this issue on overpopulation touch upon the contentious nature of the population question. Controversy surrounding population issues has underwritten decades of silence and neglect, since many analysts understandably do not want to be stigmatized by the slur of ‘neo-Malthusian,’ branded an ‘eco-fascist’ or shamed for allegedly blaming the world’s poor for our woes.

Suspecting population analysts of harbouring ethically dubious motives could not be more amiss or more ironic. Environmental writers and activists who highlight the calamities connected with overpopulation are motivated by deep concern for the well-being of all life; they also emphasize that a smaller global population can be achieved by policies and actions that promote fundamental human rights. To achieve a sustainable human population, they urge the global community to pursue full gender equity; ensure education for girls (and all children) through secondary schooling and beyond; make high-quality family planning universally available; include comprehensive sexuality education in school curricula; and aggressively oppose the abusive cultural practice of child marriage. With these human rights ambitiously pursued and universally attained, population growth can end sooner (than via ‘the invisible hand’ of globalization) and a smaller global population gradually attained.

These human rights will markedly improve the quality of life of individuals, while in their aggregate demographic outcome they will markedly support a higher quality of life for all beings on Earth. As I discuss in this essay, a smaller human population can be supported with agroecological (organic, diversified, no- or low-tillage) food production. Such regenerative agriculture systems will provide nutritious food for all people; practice an ethical rapport with nonhuman life, both domestic and wild; and mitigate the climate crisis by

absorbing anthropogenic carbon from the atmosphere and keeping soil carbon safely sequestered. Superseding chemical (industrial) agriculture will terminate its nonstop polluting and killing operations that afflict planetary and human health and threaten to unalterably impoverish Earth's remaining biodiversity. Fighting for a food system that is just and healthy for all, as well as modestly scaled within the Earth system, necessitates a global human population far lower than it is today – let alone than where it is going if silence and neglect around the population factor continue.

Actively decelerating, ending and reversing population growth, as all authors in this issue urge, is a critical action that humanity must take if our goal is the preservation of a biodiverse planet, averting unnecessary suffering and death, and bequeathing a high quality of life to posterity.

* * * * *

Half the world's population of nearly 8 billion people is supported with food grown with synthetic fertilizer (Ritchie and Roser, 2020). Herein lies a crucial indicator (if not definition) of overpopulation. What enabled the population explosion, in connection to the food system, has been the industrial production of fertilizer utilizing the Haber-Bosch process, which of all innovations of the Green Revolution is the single most decisive factor in boosting crop yields (Erisman *et al.*, 2008; Ritchie and Roser, 2020).

Synthetic fertilizer has bankrolled population growth and synthetic fertilizer is a pollution disaster. The disaster of nitrogen pollution has remained somewhat under wraps. Röckstrom and co-workers' (2009) analysis of planetary-boundaries showed that the nitrogen cycle and biodiversity loss were the most exceeded Earth-system boundaries, followed by climate change. However, it is climate change that has commanded the most attention – nitrogen pollution far less so (Pearce, 2018). Generally overlooked as well is that nitrogen pollution and biodiversity loss are not coincidentally in the red zone of breached planetary boundaries: anthropogenic nitrogen is one of the drivers of biodiversity destruction (Campbell *et al.*, 2017). What's more, human population growth – especially via the expansion of the food factor – has been a cornerstone of both.

Anthropogenic nitrogen has not received anything close to the attention it deserves for three reasons. First, it is a complicated matter given that nitrogen pollution bears on soil, groundwater, streams, rivers, lakes, estuaries, coastal seas, atmosphere, climate and stratosphere (Erisman *et al.*, 2013). Grasping the big picture of disrupting the nitrogen cycle – over half of the nitrogen in the Earth system is anthropogenic – is thus not a straightforward exercise (and one I barely scratch the surface of in this essay). Second, nitrogen pollution is obscured by the vocabulary used to describe it. A sampling from the scientific and popular literature includes terminology such as *excess nutrients*, *nutrient overload*, *algal blooms* and *eutrophication* (from the Greek for 'well-nourished'). Such seemingly 'life-friendly' descriptors make it easier to gloss over anthropogenic nitrogen, which menaces life beginning with its adverse impact

on soil biodiversity. That impact is all the more deleterious because fertilizers are typically accompanied by other Green Revolution poisons – fungicides, herbicides, and insecticides. A third reason that the dangers of nitrogen pollution remain relatively overlooked is the connection between synthetic fertilizer use and human population size and growth. Since many analysts and lay people prefer not to broach the politically sensitive ‘population question,’ discussion of nitrogen pollution is also muffled.

Fertility: Real and fake

The problem of anthropogenic nitrogen looms. It is not so much the elephant in the room as the multi-headed Hydra in the room. Nitrogen pollution fans out into all Earth systems, and it stems mostly from one thing: synthetic fertilizer, or NPK (nitrogen-phosphorus-potassium fertilizer ingredients), or *anthropogenic nitrogen* as I refer to it here for simplicity’s sake.

Perhaps the most obfuscating vocabulary associated with synthetic *fertilizer* is the word *fertilizer* itself – a word in which the idea of ‘fertility’ features centrally. Yet synthetic fertilizers do not have much to do with fertility. To be sure, they make crops grow faster and bigger; but so would giving your child growth hormone. Biological fertility, by contrast, is neither a hurried nor lopsided affair, but ensues from life’s diversity and relationships, wherein living processes build and decompose organic matter in soil structures. Agronomist Richard Haney states that organic matter on farmland is a critical indicator of fertility. After decades of chemical farming, levels of organic matter are way down, in some fields lower than one per cent; where synthetic fertilizer is applied both microbe activity and organic matter are low (Haney quoted in Schiffman, 2017). In brief, synthetic fertilizers actually diminish fertility while appearing to augment it. Along with other chemical inputs, fertilizers degrade the soil and simultaneously mask that degradation.

The high yields of Green Revolution agriculture come at the unsustainable price of ruining the health of the soil. “Healthy soil,” organic farmer Jason McKenney writes, “is an inherently biological medium” (McKenney, 2002: 122). With natural fertility, plants absorb a diversity of nutrients from life-made and life-cycled organic matter; those nutrients are gradually released into the soil and slowly absorbed by plants in the course of their natural growth (Jackson, 2002). The profusion of foods that surround citizens (especially) of the developed world – a profusion that much of humanity aspires to – comes at the Faustian trade-off of Earth’s fertility. Over time, Green Revolution agriculture extinguishes fertility by bombarding (soil and above-soil) biodiversity with chemicals. Haney succinctly summarizes the mind-set of chemical agriculture: “Let’s kill everything and grow what we want” (quoted in Schiffman, 2017).

The impact of fertilizer on soil is only the beginning. Actually, there’s a beginning before the soil, when fertilizer is produced via the Haber-Bosch method. That process is so energy intensive that manufacturing fertilizers yearly emits as many greenhouse gases as all United States households (Johnson, 2018). More greenhouse pollution comes after fertilizer application,

when the heat-trapping gas nitrous oxide (N₂O) is released into the atmosphere. Global emissions of nitrous oxide have increased 30 per cent in the last four decades. “The recent growth of N₂O emissions,” write Hanqin Tian and colleagues, “exceeds some of the highest projected emissions scenarios, underscoring the urgency to mitigate N₂O emissions” (Tian *et al.*, 2020: 248). Underscoring that urgency further, nitrous oxide emissions are emerging as this century’s lead threat to stratospheric ozone, just when we thought we had effectively addressed that problem (Campbell *et al.*, 2017; Tian *et al.*, 2020).

Anthropogenic nitrogen seeps into ground and surface waters, poisoning the drinking supplies of humans and other animals. Nitrogen pollution is deadly to freshwater and marine organisms by triggering algal growth, which rapidly exhausts water-dissolved oxygen and asphyxiates living beings. Through this mechanism, chemical agriculture has, for example, divested North American waterways of their once bounteous life. “Nationwide,” writes environmental author Richard Manning, “any river or stream that wends through farm country suffers pollution to the point of death... In the upper Midwest the plague is near total” (Manning, 2016). The plague is also near total in many of China’s rivers, lakes and estuaries (Pearce, 2018).

Dead zones in estuaries and coasts have multiplied ten-fold since 1950 (Minogue, 2018). The dead zone in the Gulf of Mexico, caused by the Mississippi River washing America’s Corn Belt nitrogen (mostly from fertilizer but also from manure) into the estuary, typically extends 5,300 square miles; in 2017, it reached a record area of 8,800 square miles (Pearce, 2018). This surge may be signalling what lies ahead, as scientists warn that mounting deluges and floods, in a rapidly warming world, will magnify nitrogen pollution of Earth’s waters (Sinha *et al.*, 2017; Conniff, 2017). And it is not only coastal seas suffering from human-driven anoxia – the ocean’s open waters are also seeing substantial oxygen drops due to global heating. “To halt the [marine oxygen] decline,” reports Kristen Minogue, “the world needs to rein in both climate change and nutrient pollution” (Minogue, 2018). What we are seeing instead is these life-devastating crises intensifying and fueling each other.

Synthetic fertilizer as a detonator

When nitrogen pollution spills into waters, its action resembles dynamiting: it can cause mass die-offs of fish and other creatures. Speaking more metaphorically, synthetic fertilizer has also been – in the words of Vaclav Smil (1999) – the detonator of the human population explosion. They have also been a detonator of the farmed animal population: the industrial production of synthetic fertilizer, post mid-20th century, facilitated the explosive growth of livestock numbers by allowing more crop allocation for animal feed (Ritchie and Roser, 2020). Indeed, according to a recent report, no less than three quarters of nitrogen fertilizer worldwide is used to make livestock feed (Wise, 2021). Growing numbers of livestock, especially in factory farms, have compounded and further toxified nitrogen contamination. The manure streaming from those operations is a noxious nitrogen-loaded sludge of

pathogens, antibiotics, growth hormones, animal body parts, cleaning compounds and other chemicals. That sludge is stored in underground pits or open-air ‘lagoons’ – or sprayed on fields as *fertilizer* (Weis, 2013).

The chemical agriculture that exacts such ecological costs and demands human acquiescence to using a detonator in lieu of biological fertility is worth opposing with determination. Chemical agriculture also exacts a steep social cost. Synthetic fertilizer and the entire Green-Revolution-inputs package make Big Ag and Big Pharma exceedingly wealthy and politically powerful. Agrochemical giants profit from ecological devastation, while pharmaceutical companies profit from mounting chronic diseases fuelled by industrial food and a polluted planet. Rising human and livestock numbers – entangled in mutually-reinforcing feedback loops with chemical agriculture – are thus heightening both the ecological catastrophes and corporate malignancies associated with that agriculture. Indeed, we are heading – nonchalantly, as far as the political-economic establishment is concerned – toward a nitrogen-drenched, not to say glyphosate-drenched, planet. Is it not time to rethink fundamentally the question of ‘feeding the world’?

Environmental analysts insist on the imperative of increasing the efficiency of synthetic fertilizer application (Foley *et al.*, 2011; Mueller *et al.*, 2012; Willett *et al.*, 2019). No doubt, this is extremely urgent. Yet all the talk of ‘precision agriculture’ in order to mitigate nitrogen pollution (and other challenges) threatens to vanish into thin air by precipitation torrents, as well as by sheer growth overwhelming efficiency gains: growth of the food system in the wake of increasing human and livestock numbers, standards of living and global trade. A 2019 *Lancet* article drily summarizes the dire forecast: “For the business-as-usual scenario, we project that food production could increase greenhouse-gas emissions, cropland use, freshwater use, and nitrogen and phosphorus application by 50–90% from 2010 to 2050 in absence of dedicated mitigation measures” (Willett *et al.*, 2019: 471; emphasis added). We are already dangerously breaching boundaries on all those fronts. What does the world look like even in a single generation?

While we pressingly need “dedicated mitigation measures” in conventional food production in the short term, even more pressingly we need to phase out chemical agriculture. The reason goes beyond the massive problems outlined above. More fundamentally, it is about refusing the killing mind-set and fake fertility of chemical agriculture. Earth creates an abundance of diverse life and Earth knows fertility. By revering nature’s life-affirming ways and emulating them, we can design food production systems that will allow us to thrive along with all Earth’s beings.

Staying within limits

To nourish ourselves we should not exceed the constraints that Earth’s fertility offers humanity as one among countless life-forms. By staying within the limits that sustain all biodiversity, humans can receive the gift of an indefinite sojourn on a fecund planet. It is odd, and sadly telling, that the idea of limits rings negative to so many a modern ear. Yet a high-quality human life

nourished by Earth's plenitude can *only* transpire within limits. Breaking limits is rarely good; after all, it's the very meaning of gluttony. By exceeding the constraints of our fair share of the biosphere's fecundity, we have impoverished the whole planet, present and future humans included. On the other hand, honouring limits circumscribed by Earth's inherent fertility has unavoidable implications for sustainable human numbers.

The recognition that we have overpopulated the planet does not amount to wishing away half the human population. That is a foolish inference and a groundless suspicion. In my view, it is naysayers of overpopulation who unwittingly fail the test of compassion for both nonhumans and human beings given the tough times here and ahead. To mention only one gruelling challenge, estimated projections of 21st century environmental refugees number in the hundreds of millions. Climate change alone is expected to displace 200 million people by 2050 (Merone and Tait, 2018). By mindfully choosing today to bring fewer children into the world, we increase the odds of shepherding human and nonhuman beings through a less chaotic future. The compassionate call we might all rally around – regardless of our perspective on the population question – is broadcasting the option of adoption. Instead of bringing more children into existence at this historical juncture (especially more than one), prospective parents can choose to adopt children who are already here and need a home.

Addressing overpopulation will be an intergenerational achievement. Advocating for a global shift toward plant-based eating is also critical, for even partial success in this endeavour will yield benefits more swiftly. Without a dietary revolution, the momentum of population growth in the pipeline, alongside expected rising consumption of calories and animal products, will dangerously swell food demands even by mid-century (Mueller *et al.*, 2012; Willett *et al.*, 2019). By contrast, were people to shift to a plant-based diet, humanity would need only one-fourth of current agricultural land for sustenance; seventy-five per cent of cultivated lands and pasture could thus be reverted to wild ecosystems (Richie, 2021). Marine life would also rebound if humanity chose a plant-based diet. Such restitution of terrestrial and marine biodiversity would be beautiful and hope-filled, and it would contribute significantly to absorbing and retaining anthropogenic carbon (Griscom *et al.*, 2017; Roberts *et al.*, 2017).

We could say, enlarging on George Monbiot's point, that we have *two* population crises (see Monbiot, 2015). One of humans, especially considering that the entire population will not convert to plant-based eating in the foreseeable future and that food is only one of the human systems that takes a heavy ecological toll. The second population crisis is of livestock, which can be met by people choosing to become more, hopefully *mostly*, plant-based eaters. Global human transformation into a smaller sized, mainly plant-based species may not be as farfetched as it sounds: that choice will support Earth's well-being and human health in tandem.

Addressing two overpopulation challenges is hardly the sole task before us. The global economic machine – like its chemical-agriculture and industrial-

food industry subsidiaries – is all about the insane pursuit of High Yields: over-extractionist, over-producing and overly wasteful. With the use of its financial arm, the global economic machine also orchestrates over-consumption chiefly through the fabricated ploy of shelling out credit and producing debt (Lazzarato, 2012). Human beings are becoming ‘richer’ (some obscenely so) by devastating the planet and selling out the future.

There remains a beautiful possibility that may still lie within reach. Earth is the creative source of life’s resplendent diversity, abundance, complexity and unfolding. To preserve that fecund, life-nurturing planet we have to defer to its aboriginal ways, cease domineering and downscale the human enterprise on all fronts. The only thing that can inspire such a swerve from ‘business as usual’ is recognizing our love for planet Earth. It’s the only chance we’ve got.

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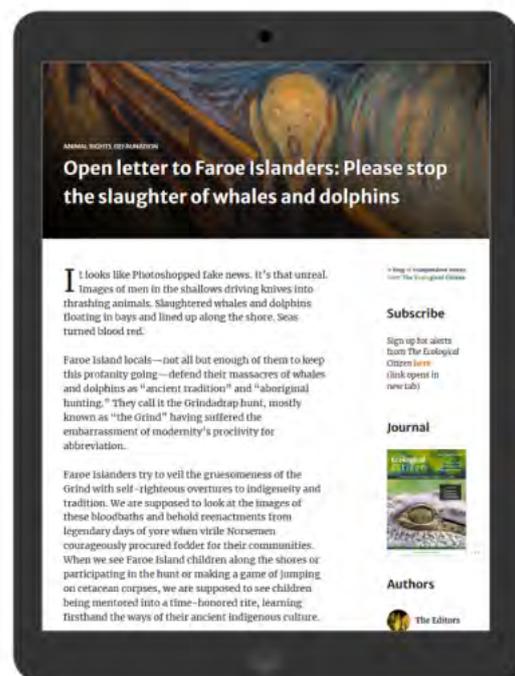
Earth Tongues

A blog of independent voices
from **The Ecological Citizen**

This blog was launched on the occasion
of the **50th Earth Day** (22 April 2020)
by the Editors of *The Ecological Citizen*.

The blog's name honours the
small fungi who emerge, tongue-like,
from forest floors and grasslands.

It is not too much of a leap of imagination
to see the tongues as representing the
Earth's efforts to protest against the
manifold tragedies being inflicted
on her life forms and systems by
the rapacious, and sometimes cruel,
behaviour of **modern human societies**.



Find all posts at <https://blog.ecologicalcitizen.net/>



Altered

Elizabeth S Quinn

Mycelium, hemp substrate, fabric scraps (2021)

These artworks are all made from natural organisms and found materials. The pieces I create are both a celebration of the natural world and an invitation to discuss our role as artists in doing no harm. It is my greatest hope that once these elements have fulfilled this purpose in their current state, they will be given back to the Earth to start anew.

Higher-quality versions of artwork from this issue: <https://www.ecologicalcitizen.net/artworks.php?v=5&n=1>



Nourished
Elizabeth S Quinn

Mycelium, hemp substrate, turmeric, vintage brooch (2021)

Higher-quality versions of artwork from this issue:
<https://www.ecologicalcitizen.net/artworks.php?v=5&n=1>



Preserved

Elizabeth S Quinn

Mycelium, hemp substrate, dried flowers, bioplastic (2020)

Higher-quality versions of artwork from this issue:

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The most ethical gift: Towards a sustainable demographic future

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Keywords: overpopulation

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The goal of slowing down, stopping and eventually reversing human population growth is no longer to avert an ecological catastrophe. That ship has sailed. Activists, funders and non-governmental organizations focused on population are operating in the midst of overshoot already in progress. Accepting this reality, and building messaging around it, may help considerably in optimizing the public face of population advocacy moving forward.

As of now, population activists should advance an *intergenerational narrative* when it comes to explaining the ecological relevancy of human population size and growth. Population interventions should be framed as ethical imperatives, and long-term projects to improve the chances of future generations establishing sustainable living scenarios with the planet. Continuing to frame population interventions as being able to pay immediate and substantial demographic dividends at the global scale – or as the indisputable priority actions for near term mitigation of the greenhouse gas emissions and biodiversity crises – no longer makes sense.

To be clear, creating the conditions for population growth to stop, and minimizing total population increases prior to the eventual global peak, are still the two key population objectives. Once the peak arrives, and population starts naturally decreasing, there will be new messaging and public relations challenges for population-aware environmentalists. But this is a long way off. Even the most optimistic projections do not forecast an end to population growth until the 2050s or 2060s, and those that do assume heroic ongoing work to help fertility decrease further. Of course, this inconvenient truth will not stop anthropocentric economists and politicians from calling for higher birth rates, and we can expect outright panic from them as fertility decreases further.

But, for the ecologically informed, admitting that global demographic trends, in any non-dystopian scenario, cannot be made to turn on a dime is emotionally difficult. Every moment that passes we see the living Earth suffer

heinously. We want to intervene quickly, strongly and decisively. Yet, in terms of population, concepts of 'quickness' extend to decades. It will likely take at least 30 or 40 years to end population growth – and the greenhouse gas emissions and biodiversity crises must be largely resolved long before then.

By ceding a sense of immediacy in our outlook and messaging, population activists can be fully enriched in our ability to stake out visions of future global sustainability. Beautiful scenes of an equitable, ecologically-informed population of two billion, living in harmony with a wild and vibrant Earth, are appealing to human nature. They speak to the ethics of caring for our descendants' wellbeing. They also give us the exact platform we need to double down on population programs and public education, for the most critical factors in determining the future population size of humanity are the family size decisions of today. There are well-understood, affordable and progressive ways to decrease family size outcomes.

I agree with Oswald Spengler: optimism equals cowardice. There is nothing to be optimistic about, ecologically speaking. The power of positive thinking, on the other hand, is different. It is not naivety; in fact, it is predicated on a full and sober accounting of reality. In terms of the human population size relative to the Earth's sustainable capacity to support it, the reality is we are living in a disaster. This situation is deplorable, tragic, frustrating and outrageous – but appeals for forward-looking population-related programs, and organizing sufficient public support for them, need to go beyond condemnations of the condemnable. Would be supporters also need to form a positive emotional attachment to the idea of an improved, sustainable demographic future.

The most ethical gift we can give the people and creatures of the late 21st century and early 22nd century is a chance. In the realm of population, this means working across the generations to ensure a much smaller, more ecologically right-sized number of humans.

The pangolin is not the culprit and species do not mount invasions

Andrea Cardini

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Keywords: language

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One year ago, at the end of my teaching semester, I was doing my weekly reading of the main science journals and was struck by how the initial hypothesis on the origin of the COVID-19 pandemic was recalled in a ‘News and Views’ in the prestigious journal *Nature*. “The Malayan pangolin”, the authors wrote, “suddenly faced allegations that it was the culprit” (Koutsakos and Kedzierska, 2020).

Back then, as were many others, I was paying special attention to the research news on the pandemic. That was not just because I was worried, and wanted to learn more, about the virus. It was also because of my interest in the story of the origin of the zoonosis, as a biologist who teaches students an introductory course on mammals. In my lectures, besides teaching students about evolution, adaptation, ecology and behaviour, I also speak about conservation and ethics, and how we often see our relationships with other living beings through the distorted lens of anthropocentrism.

One of the topics I find particularly hard to discuss is how animals – and, in particular, mammals – may ‘bring us’, and ecosystems, damage, as in cases of zoonoses and ‘alien species invasions’. But are animals really responsible?

That is certainly how we tend to describe stories of unfortunate consequences of the interactions between humans and other species of animals and plants. Consider the following:

- 1 “Wild animals probably brought it [sc. SARS-CoV-2] to humans in the first place” and among “primary suspects early in the pandemic, pigs were top of the watchlist” (Mallapaty, 2021).
- 2 “The invasive snail ... fooled zoologists” (Nature, 2018).
- 3 “South Africa’s invasive species guzzle precious water and cost US\$450 million a year” (Wild, 2018).
- 4 “Invasive alien species are responsible for substantial losses of goods, services and production capacity ... and economic resources are spent each year for their management” (Diagne *et al.*, 2021).

These are just a few examples, taken from articles published in the last few years in *Nature*. In each case, we find linguistic structures that make non-human species the grammatical subject of various actions which damage humans, and that ascribe intentionality to – and responsibility for – those actions. Animals, it seems, *bring* us diseases, *fool* us, *invade* our territories, and are *responsible* for causing economic and environmental harm.

However, neither pangolins nor pigs intended to transmit diseases; snails and pine trees, all by themselves, did not invade continents or steal water. None of these species bear responsibility in the way that our anthropocentric language suggests. On the contrary, it is *we* who trap, trade and kill pangolins and thousands of other wild species, from which we may catch a new disease. It is *we* who introduce – sometimes unintentionally but often intentionally – alien species, that may or may not have become successful but harmful residents outside their native range. *We* are to blame and thus *we* ought to be the grammatical subject of those sentences.

Even the names we use are often misleading, as when we call a species an *invader* (Knight, 2001; Wild, 2018). The word ‘invade’ connotes military conquest, and subjugation through force. We should, instead, say that these are *anthropogenically introduced* (‘anthroproduced’, for brevity) species – a name that clearly locates where agency and thus responsibility lies.

Such semantic shifts look small, but they may help us to focus better on the real source of the problems: raising awareness of *our* responsibility for environmental damage. These shifts also stress the importance of prevention, instead of continuing on with ‘business as usual’ and only later looking for morally difficult, and often ineffective, solutions (Rollin, 2014; Pluess *et al.*, 2012).

I realized more deeply the potentially perverse implications of semantics while listening to a BBC Radio podcast on sexual violence, where it was noted by a psychologist how we commonly say “she was raped”, and that this agentless passive construction subtly suggests that the *victim* bears the responsibility. In the words of an earlier study, this kind of grammatical construction “obscure[es] agency by placing the actor in the background, and the victim in the foreground, of discourse” (Bohner, 2001: 516–17). Shouldn’t we say “he raped her”, “we caught a virus from pangolins, bats or rodents” and “we introduced alien species”?

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Madison Falls
Fen Hsu

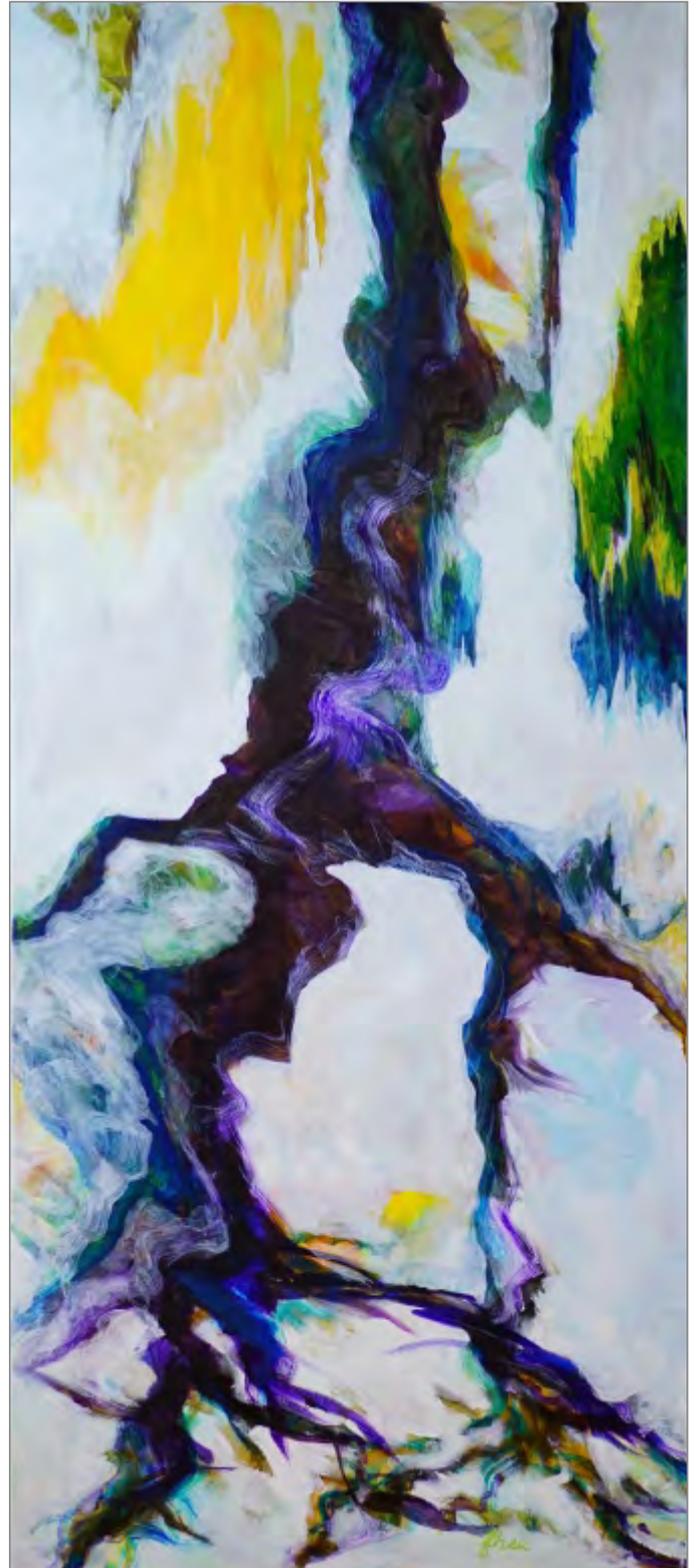
From the artist: I paint from a combination art studio, home office and laundry room on Mercer Island, near Seattle in the Pacific Northwest, US. I remember taking art classes taught by the abstract painter John DiPaolo at the de Young Museum art school. Art is endlessly fascinating for continuously reframing ideas, provoking thought and opening the heart.

These paintings were made during a difficult period in my life. I visualized sunlight, water, trees and root structures in a flux of stress and resilience, mirroring my own life. As I was painting, I thought of trees in Seward Park in Seattle, where I enjoyed many hours outdoors as a volunteer Tree Ambassador. I thought about how trees survive through hidden strategies including the compartmentalization of wounds, below-ground signaling and adaptive growth. I am hoping these energized organic forms express the inventiveness and exuberance of nature and the wild.

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Blush of the cherry blossoms
Fen Hsu



Wisdom of the rooted
Fen Hsu

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View of Mount Hood from Maryhill Stonehenge
Fen Hsu

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<https://www.ecologicalcitizen.net/artworks.php?v=5&n=1>



Flying through leaves
Fen Hsu



Breath of autumn
Fen Hsu

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Overpopulation denial syndrome

Robin Maynard

Robin is an environmental communicator, campaigner and strategist (for more information see <http://robinmaynard.com/>). He is also Director of the organization Population Matters (<https://populationmatters.org/>).

Keywords: overpopulation; societal change

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Professor Diana Coole of the University of London helpfully identifies what she calls *silencing discourses* – arguments used by those who wish to shut down, avoid or divert any reasoned discussion about the impacts of human population upon the environment and, indeed, upon our own wellbeing as a species. According to Coole (2013) there are six such silencing discourses: *Population Scepticism, Fatalism, Decomposing, Declinism, Growth, and Shaming*. As Director of Population Matters (<https://populationmatters.org/>) and seeking to raise the issue with colleagues in the environment movement, I've experienced all six silencers – sometimes as a volley!

The first five of Coole's silencing discourses can be summarized as follows.

- 1 **Population Scepticism** brushes away any concerns about population: '*Birth rates are falling, the global population will peak at some point this (or maybe the next...) century. The problem will take care of itself*'.
- 2 **Population Fatalism** goes a step further: '*Global population is set to hit 9, maybe 10 billion by 2050, and there's nothing we can do about it*'.
- 3 **Population Decomposing** magics away the problem with technology: '*It's true that population growth presents some challenges – but technological fixes (like genetically modified crops, carbon capture etc.) can extend the boundaries of our planet, easily enabling it to absorb another 3, 4 billion or even more people*'.
- 4 **Population Declinism** is the preference of nationalistic politicians, neoliberal economists and journalists seeking alarmist headlines: '*A declining, ageing population means a declining, moribund, stagnant economy. Without more new workers – another cohort of consumers – who's going to pay for our pensions?*'.
- 5 **Population Growth** presents the shiny face of that two-sided coin: '*All growth is good – of people, of GDP. More people equals more productivity. Rapidly growing populations in time offer developing countries a “demographic dividend” rather than a strain on infrastructure or ecosystems*'.

I won't elaborate here on the counter-arguments to these five silencers (see Maynard, 2018, for more detailed discussion). A basic understanding of the principles of ecology and the extent of the current and increasing stresses on biodiversity and the Earth's ecosystems can unpick them.

Which leaves the sixth of Coole's silencing discourses: *Population Shaming* – perhaps better termed *Naming*. Rational, factual responses to Population Shaming dry in the throat, as insinuation and moral condemnation are its *modi operandi*, attributing underlying dark motivations and associations with the worst manifestations of past population control (such as eugenics or ultra-nationalist movements) to anyone who raises the issue of human overpopulation.

We can agree that past coercive approaches (*e.g.* sterilization campaigns in India in the 1970s, or China's previous 'one child policy') were deplorable; however, there are many other, more recent, progressive initiatives that have succeeded in reducing population growth. For example, South Korea, Sri Lanka and Thailand have all succeeded in managing down their fertility rates from 6 or more children per woman on average in the 1960s and 1970s, to below replacement levels (2.1 children) today through non-coercive family planning programmes (Dérer, 2019; United Nations Population Fund, 2018; O'Sullivan, 2013; Bongaarts and Sinding, 2009). Another example is Bangladesh, where over the past 25 years, fertility rates have fallen from an average of 7 children per woman to 2.3 today, because safe, modern family planning has been made accessible through civil society and women-led programmes (Rizvi, 2018). Of all of what the UN used to term 'impoverished countries', Bangladesh is the only one to achieve the Millennium Development Goals (precursors to the Sustainable Development Goals). Its progressive family planning programmes are acknowledged to have been key to that achievement (Asadullah and Savoia, 2018; World Bank, 2005).

Population Shaming relies on triggering emotional, deeply-embedded ideological and personal value responses. The power of this silencing discourse is that it thereby appeals to precisely what tends to make people environmentalists: strongly held, personal values grounded in, or informed by, some form of ideology. I include myself in that characterization – motivated by a passionate belief that a better, fairer, greener world is possible, and driven by personal outrage at the stripping away of all other species bar our own or those useful to us. Such beliefs motivate us to fight for that better world, but they also make us vulnerable to having our thinking about population short-circuited by insinuations that anyone who considers population an important factor is in some way keeping company with 'eco-fascists' or harking back to abhorrent eugenicist views. This is palpably absurd, when you consider that respected international scientific bodies such as the Intergovernmental Panel on Climate Change (2014, 2018), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2019), and the collective *World Scientists' Warning to Humanity* (see Ripple *et al.*, 2017) all acknowledge and highlight population alongside and in harness with other drivers of the ecological crisis.

Refusing to think clearly about population is also, in a way, convenient, for it allows people in the Global North to shut their eyes to the personal responsibility and agency that, in the main, they are privileged to possess in comparison to those in the Global South – not just in what they choose to consume, but also in the decisions they make about parenthood. It can be hard for us to recognize that extreme capitalism and consumerism – whilst deservedly centre-frame – are to some degree only playing upon, and amplifying, our own needs, addictions and desires.

Environmental writer and polemicist George Monbiot is a notable ‘Population Shamer’. He writes (Monbiot, 2020) that:

*Population is where you go when you haven't thought your argument through.
Population is where you go when you don't have the guts to face the structural, systemic causes of our predicament: inequality, oligarchic power, capitalism.
Population is where you go when you want to kick down.*

Given such pronouncements from *The Guardian*'s ‘green guru’, it is unsurprising that few in the environmental movement dare to raise population as a factor, alongside and in harness with others. Monbiot has an honourable record in standing up against global injustice and ecocide, but with a platform affording him considerable reach, he is also an influencer of ‘norms’ in discourse about environmental matters – in this case, population matters. The great irony and moral flaw in Monbiot's ideological stance is that, in particular for people living in high-consuming countries like the UK, the most impactful eco-action they can take is to choose to have a smaller family (as researchers at Lund University, Sweden, have shown – see Wynes and Nicholas, 2017; Carrington, 2017).

For the poorest people living in the Global South, addressing population is primarily about enabling choice, and empowering those over 270 million women and girls that the World Health Organization (2020) estimates have an unmet need for safe, modern contraception, and so lack the capacity to exercise their right to manage their own fertility. The additional benefit arising from addressing that unmet need and enabling that fundamental human right, is to cut a greater quantity of carbon emissions than from almost any other available solution. Project Drawdown, the global research project set up to identify the top 100 available, most effective solutions to the climate crisis, ranked the synergistic solutions of universal education for girls and access to family planning as the number one solution, saving more CO₂ over the next 30 years than all offshore and onshore wind-power combined. Its 2019 revision demotes that solution to number two, although still avoiding 85.4 gigatons of CO₂ by 2050, marginally below the top ranked solution of ending all food waste globally at 87.5 gigatons (<https://drawdown.org/solutions/table-of-solutions>).

Fittingly, Project Drawdown founder Paul Hawken described that combination of girls' education and family planning as a ‘No Regrets’ solution. His comments are worth quoting at length (Hawken, 2017: 81–2):

An intrinsic right, education lays a foundation for vibrant lives for girls and women, their families, and their communities. It is the most powerful lever available for breaking the cycle of intergenerational poverty, while mitigating emissions by curbing population growth. A 2010 economic study shows that investment in educating girls is “highly cost-competitive with almost all of the existing options for carbon emissions abatement” – perhaps just \$10 per ton of carbon dioxide.

Education also shores up resilience in terms of climate change impacts – something the world needs as warming mounts. Across low-income countries, there is a strong link between women and the natural systems at the heart of family and community life. Women often and increasingly play roles as stewards and managers of food, soil, trees, and water. As educated girls become educated women, they can fuse inherited traditional knowledge with new information accessed through the written word.

Monbiot and his acolytes appear ignorant of – or choose perversely to ignore – the inconvenient facts of the considerable human rights, climate and biodiversity benefits of addressing the human population factor. A perverse position, as it is those oligarchs, capitalists and free market economists whom he rightly rails against, who gain most from the denial of population growth as an issue of concern. They have a vested interest in a growing population, seeing expanding markets for their goods and services, boosting consumerism globally (3.5 billion high-level consumers globally currently, set to rise to 5 billion by 2050 – Kharas, 2017), and seeding exaggerated fears in the public’s and politicians’ minds that without fresh cohorts of young people as labour, social services and pension funds will collapse.

Population Matters, the organization I work for, partners with groups and individuals across the world, supporting grassroots and community organizations from Kenya, Poland, to the UK Midlands through our crowd-funding programme, Empower to Plan (<https://is.gd/bAoFne>). We do not impose our views or presence upon people anywhere, but operate and engage only where we are welcomed. An example was the invitation we received from the Nigerian Conservation Foundation (NCF) to co-host a seminar in 2019 in Lagos marking UN World Population Day (<https://www.ncfnigeria.org/>). I assume Monbiot would not accuse NCF’s director, Dr Muhtari Aminu-Kanu, of ‘kicking down’, ‘poor blaming’, being ‘far-right’ or ‘racist’ in posing the rhetorical question in his opening address, “We will be making big progress if at first we acknowledge we have a population problem. If we don’t discuss it, who will?”.

For Nigeria, where the average number of children per woman stands at over 5, and with the country’s population projected to double from 200 million to 400 million by 2050, the problem and challenges are clear – and were openly acknowledged by Nigeria’s State Minister for the Environment who also spoke at the seminar. Infrastructure is overstretched, and there is burgeoning social unrest. Unemployment stands at over 30% and with over 40% of the

population made up of young men between the ages of 15 and 40, insurgency groups are gaining recruits – especially in northeast Nigeria, where climate breakdown further undermines livelihoods (Olurounbi, 2021).

In the Global South, population is primarily a human development, social and welfare issue, exacerbating environmental impacts. For those of us living in wealthy countries, population is an issue of personal responsibility, morality and justice. Alongside doing what we can to empower disadvantaged communities, we must make responsible choices, including regarding our family size, to secure a better future for all human beings and for the Earth as a whole.

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Don't confuse a symptom with the problem: Overpopulation, not climate change, is the real emergency

Madeline Weld

Madeline is the president of Population Institute Canada.

Keywords: climate change; overpopulation

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If the mainstream media (MSM) were one's only source of information, one would think that humanity was in mortal danger from a looming climate catastrophe driven by emissions from the burning of fossil fuels on which modern industrial society depends. One would hear little or nothing about a human population growing by one billion (1×10^9) every twelve years. There might be the odd reference to the population issue, especially when the milestone of another billion was reached, but alarm bells, if any, would be muted and short-lived.

Given the lack of coverage about population growth, this MSM-limited information consumer would very probably fail to link concerns about human-caused climate catastrophe to the ever-growing number of humans on the planet. This consumer would likely come to believe that the major environmental problem facing humanity is increasingly severe climate change caused by a relatively small subset of the human population through its profligate use of energy and other resources, and that he or she is part of this subset. In other words, that climate change is driven by 'overconsumption' by the rich.

At the same time, this consumer of MSM information would learn that continuous growth in economic throughput is essential, and that the growth of the gross domestic product (GDP) is the prime, if not the only, indicator of human well-being. One of the ways to grow the GDP is through population growth. The MSM-consumer would probably also learn that the low domestic birthrate was a problem, and that immigration was one way to compensate for it. He or she would also come to understand, both through explicit statements and by perceiving societal taboos from what is said and not said, that immigration is good and questioning the government's high annual intake borders on racism.

But this consumer of information from the MSM would be very unlikely to hear that migrants tend to greatly increase their greenhouse gas (GHG) emissions in their new (wealthier) country. In the case of Canada, where I live, due to higher consumption levels and the cold climate, emissions increase on average by a factor of four.¹ These would be the same emissions that are blamed for driving climate change and threatening human survival. Since GHG emissions are bad, but continuous economic growth (which results in more GHG emissions) is essential, other ways, compatible with continuous growth, must be found to reduce the emissions. These ways include investment in 'green' technologies, especially solar and wind. The fact that solar and wind can't meet the annual increase in energy demand, let alone replace the fossil fuels currently being used (see, for example, Rees, 2019), does not receive much coverage in the MSM. The consumer would also be unlikely to read, see or hear much about the environmental costs of extracting the non-renewable resources involved in creating 'green' energy sources such as photovoltaic cells and windmills.

The cognitive dissonance of ignoring (or, in the case of some countries, such as Canada, the US and Australia, actively promoting) population growth while purportedly fighting climate change caused by human activities is not limited to national governments. It afflicts non-governmental and supranational organizations as well. For example, the Scientists' Warning website (<https://www.scientistswarning.org/about-scientists-warning/>) was created to take up the torch from the World Scientists' Warning to Humanity, published in 1992, which included the words, "Pressures resulting from unrestrained population growth put demands on the natural world that can overwhelm any efforts to achieve a sustainable future. If we are to halt the destruction of our environment, we must accept limits to that growth" (Union of Concerned Scientists, 1992). But one has to look very hard on the Scientists' Warning website to find any mention of population. It presents the climate crisis as humanity's major problem and makes one mention of population as one of six steps to address that crisis.

The Intergovernmental Panel on Climate Change (IPCC) is also very weak on population. The IPCC played a key role in establishing the United Nations Framework Convention on Climate Change (UNFCCC) which came into effect in 1994. The UNFCCC is completely silent about population growth. And so are the Conference of the Parties (COP) meetings which arose from the UNFCCC. The British organization Population Matters created a petition addressed to the British MP who is president of COP26 (hosted by the UK government in Glasgow, November 1–12, 2021) asking the UK government to "accept that population growth is among the drivers of the climate crisis, and acknowledge that slowing it through the empowerment of women and girls can play a critical role in reducing emissions and maximizing the effectiveness of all other climate solutions." But even Population Matters is circumspect in advertising its petition, giving it the title "Urge COP26 leaders to empower women and girls" (<https://is.gd/wtvYjs>).

When a particular symptom of an underlying problem is labelled as the problem itself, and all solutions are directed at the symptom while ignoring the

problem, the problem will not be solved and the symptom will remain. If climate change is driven by human activities, then human numbers are relevant, because it is impossible for a human being to reduce his or her GHG emissions to zero. And those billions of humans whose current emissions are very low because they are very poor can only meet their substantial unmet needs by increasing their consumption levels – and thereby emitting more greenhouse gases. When you multiply something by a billion or more, even a very small number can become large.

Yet climate change is generally presented by the MSM as a problem created by rich countries whose consequences primarily affect poor countries, who will bear the brunt of extreme weather and rising sea levels. (This adds a measure of guilt to the cognitive dissonance of trying to reconcile the need for continuous economic growth with the unacceptable consequences of GHG emissions arising from economic activities.) Thus, we are frequently reminded of facts such as that the average US consumer produces 23 times the amount of GHG emissions as the average Nigerian. What we are not told is that the human population increases by over 80 million each year, almost all of it in poor countries and most of it in Africa, whose current population of 1.3 billion is projected to increase to 3 billion by 2060. And all these people – understandably – want to consume more, which unfortunately entails more GHG emissions. African governments are eyeing their coal deposits to supply energy for their growing populations (Schwikowski, 2021). China, which is now Africa's largest trade and investment partner and for whom Africa is a source of raw materials, plans to construct coal-fired plants on the continent to fuel its development projects there (Goldstone, 2021). Thus, the burgeoning poor of sub-Saharan Africa and other poor rapidly-growing regions will potentially make substantial contributions to GHG emissions in the coming decades.

The size of the human population – about 7.9 billion and counting – is the problem. It is the underlying cause of a host of environmental problems, which can all be considered symptoms of overpopulation. These include pollution of land, air and water, deforestation, erosion, loss of farmland to urbanization, aquatic dead zones due to agricultural runoff, habitat and biodiversity loss, overharvesting of fish and shellfish, depletion of rivers and aquifers, not to mention famines and many conflicts over resources. If anthropogenic climate change is just one of many symptoms of human 'overshoot' in the 'Anthropocene' era, why does it get the lion's share of attention while human population growth is ignored or de-emphasized? As Sir David Attenborough (quoted in BBC, 2009) has famously remarked, "I've never seen a problem that wouldn't be easier to solve with fewer people, or harder, and ultimately impossible, with more."

The current economic paradigm of continuous growth is ecocidal. The GDP as the sole measure of human well-being under that paradigm is not only inadequate but outright harmful. Trying to address the 'climate crisis' while remaining silent on the 'population crisis' is a non-starter. If we want to mitigate what is being called the climate crisis, then every country – including my own, which is one of the highest *per capita* resource consumers and GHG

emitters in the world – should start by seeking to determine and ultimately reach a sustainable population through policies that encourage small families, and by setting a rational level of immigration.

Note

- ¹ This is based upon calculations by John Meyer of Canadians for a Sustainable Society (<https://sustainablesociety.com/>). He took the number of migrants to Canada in 2015 from each of the top ten source countries, multiplied by the *per capita* emissions for that country, and compared the sum of those values to the value obtained by multiplying the same total number of people by the average *per capita* emissions in Canada. The ratio was 4.2 (personal communication).

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Micro-organisms
Janet Eckleberger

The work is made from scrap agricultural roofing materials, to which I add mica, mica powder and eye shadow, as well as some acrylic paints. I was interested in depicting the changing micro landscape in a way suggestive of war, and thus describing at a micro level what we are doing to the planet. The works range in size from 6 to 10 inches across and were all produced in 2019.

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Mold war I
Janet ECKLEBARGER

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Mold war II
Janet Eckerbarger

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Mold war III
Janet Eklebarger

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WITNESS: Order *Sirenia*

Eileen Crist

Eileen has written and co-edited numerous papers and books, with her work focusing on biodiversity loss and destruction of wild places, along with pathways to halt these trends.

About the WITNESS section

So much environmental thought stays inside the abstract space of philosophy, policy recommendations or debates. In this corner of *The Ecological Citizen*, we stay close to the ground: To bear witness to the losses of lifeforms, lifeways, and places that humanity's no-limitations growth is driving. To remember the Earth realities we love and are fighting to preserve.

Keywords: biodiversity; conservation; sixth mass extinction; water

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Steller's sea cow was named after naturalist Georg Steller who encountered the animals during his 1741–42 expedition aboard Vitus Bering's vessel. In his journal, Steller wrote that the sea cows inhabited the shallow waters around Bering Island, especially where streams flowed into the sea and where seaweed, their main food, was abundant. Steller called the animals "manatis" but today Steller's sea cow is considered a species of dugong, closely related to the manatees (Golder, 1925; Sleeper and Foott, 2000).

While on Bering Island, Bering's crew turned to harpooning the sea cows for food. "They were not afraid of man in the least," Steller wrote (Golder, 1925: 232). (He observed the same thing about other animals of the region including the Blue Fox, better known today as the Arctic Fox.) The absence of fear worked against the sea cows who the sailors started to slay regularly.

The killing offered a glimpse into the animals' inner life. They had, Steller observed, "an uncommon love for one another which even extended so far that, when one of them was hooked, all the others were intent on saving him" (Golder, 1925: 232–3). The sea cows circled protectively around their harpooned friend, tried to topple the captors' boat and even endeavoured to pull the harpoon out of the animal's body. Steller noted "the very curious evidence of their nature and their conjugal affection," for when an animal was harpooned, her mate would struggle to free her "with all his strength ... and follow her quite to the shore, even though we struck him many blows" (Steller quoted in Hudon, 2017: 95). About the animals' mating habits, Steller chronicled that "their mating takes place in June, after protracted preludes. The female flees slowly before the male with continual turns about, but the

male pursues her without cessation. When, however, the female is finally weary of this mock coyness she turns on her back and the male completes the mating in the human manner” (Golder, 1925: 233).

Steller’s sea cows were gentle, loving and fearless marine herbivores. They were large animals reaching up to 30 feet in length. Like their still-existing relatives, Steller’s sea cows reproduced extremely slowly. Within 27 years of their discovery (at least by Western science), the species was exterminated by hunters (Sleeper and Foott, 2000: 40). E.O. Wilson calls this type of anthropogenic extinction “rifle extinction” (Wilson, 1999: 258). By this metaphoric term, Wilson does not (necessarily) mean extermination by firearms: he means a targeted species erased from existence by deliberate lethal intent.

Remaining Sirenians

Steller’s sea cow is classified under the Order Sirenia, of which one dugong species and three manatee species are still with us today. Sirenians emerged some 50 million years ago. Among their closest relatives are the Elephants. Like their terrestrial cousins, all extant Sirenian species are endangered.

Unlike Steller’s sea cows, who were endemic to a specific area and thus fatally vulnerable to ruthless humans, Earth’s remaining Sirenians are not threatened by “rifle extinction.” In step with the present-day pattern of most threatened species, they are plagued by a smorgasbord of Anthropocenic afflictions: habitat destruction, poaching, pollution, entanglement in fishing gear, boat strikes and dam construction. Though all Sirenian species are protected (at least on paper), they are still widely hunted. Their persecution today is part of a bigger insidious trend of rising aquatic bushmeat, which is also menacing sea turtles, dolphins, crocodiles and other marine animals (Cosentino and Fisher, 2016; Marsh *et al.*, 2017; Hodgins, 2020).

Sirenians are fully or mostly herbivores, and so dwell in depths where sunlight can penetrate. They inhabit the relatively shallow waters of estuaries, lagoons, bays, and rivers. This makes them vulnerable to human depredation and to habitat destruction by coastal development as well as by agricultural (and other) pollution that decimates and contaminates their food. They have virtually no enemies other than humans. All four species are experiencing population declines and range contractions (<https://is.gd/RxtJxZ>). For the most part, despite their endangered status, they are surprisingly understudied and exact data about their populations and circumstances are hard to come by.

Dugongs once enjoyed a wide historic range throughout the coasts of many lands of the Indian and West Pacific oceans. Their numbers are falling and they have become regionally extinct in many of their former homes, including the coasts of Thailand and Cambodia (Medrano, 2019). The largest and best-monitored population of dugongs inhabits the coastline of Northern Australia, especially Shark Bay (Marsh *et al.*, 2019).

African manatees live in the rivers, estuaries and coastal waters of a number of West African countries. Information about them is scant and present numbers are estimated to hover around 10,000. According to the African

Aquatic Conservation Fund, the African manatee “is the most endangered and least studied manatee species in the world” (<https://is.gd/v7bnjD>). Continued poaching throughout their range is the main threat. “The manatee market in Nigeria is so profitable,” a recent *Guardian* article reports, “that poachers traffic the animals from neighbouring countries. A growing demand for live manatees in Asia has made matters worse” (Hammerschlag, 2020). According to environmental organization Ocean Care, an official agreement to protect African manatees “has been given no energy or commitment” (<https://is.gd/CxzV1K>). The protected Orango National Park, off the coast of Guinea, is considered one of their last strongholds.

Amazonian manatees were historically abundant throughout the Amazon River Basin. They have become rare. Their status and life conditions are shrouded in uncertainty, and estimates of their remaining numbers range from 8,000 to 30,000 (<https://is.gd/yOvYiK>). Amazonian manatees are threatened throughout their range by poaching, pollution, drowning in nets, degradation of their food sources by deforestation, and dam building (Cosentino and Fisher, 2016; Salisbury, 2017).

Lastly, the West Indies manatees are an Atlantic species that was widespread along coastal seas of Caribbean islands, southern USA states, the Gulf of Mexico and as far south as Brazil’s coastline. Until European colonists arrived to the New World, Caribbean waters abounded in manatees (Roberts, 2007: 67). They have been exterminated from most of their historic range. West Indies manatees are represented by the two subspecies: the Antillean manatees and the Florida manatees (Figure 1). According to a recent *National Geographic* report, around 2,500 Antillean manatees are thought to remain in existence; their populations are fragmented and their numbers are declining. Belize’s lagoons are home to the largest remaining numbers (<https://is.gd/iBEvQf>).



Figure 1. A Florida manatee.

Florida manatees, year 2021

With few pockets of exceptions, all four Sirenian species are losing ground worldwide. Yet despite their endangered status and their alarming accessibility to human exploitation and impacts, accurate reports about their conservation status are elusive. Exempt from this generalization, Florida manatees enjoy widespread celebrity. Their numbers are monitored. They are a tourist attraction. They are among Florida's most 'iconic species.' There are ads online for swimming with them. Yet right now, Florida manatees are dying.

As of 5 November 2021, 997 manatees, of a population estimated around 6,300, have died (<https://is.gd/To3UNa>). Florida manatees have been dying in record numbers throughout 2021, mostly from starvation as well as from a recent spate of serial record-breaking watercraft mortality (Center for Biological Diversity, 2021). (Boat strikes have been an ongoing hazard and peril for Florida's manatees.) Vast areas of seagrass – the manatees' key food source – have been destroyed, mainly by agricultural pollution, but also from household pesticide runoff, human sewage and a changing climate. For example, in the Indian River Lagoon, one of the manatees' main hangouts, almost 60 per cent of the seagrass along with its biodiversity has been lost since 2009 (Pittman, 2021).

“There are a few things that particularly disturb me about this year's deaths,” says environmental writer John R. Platt, editor of *The Revelator*, published by the Center for Biological Diversity. “Boat strikes are up, which means Florida isn't doing a great job slowing down boaters in key habitats. Perinatal deaths are way up (106 at last count, compared to 83 last year), which doesn't bode well for the next generation. And 554 of these dead manatees to date haven't been necropsied, a step that would provide key scientific data to help ensure this doesn't keep happening.” Platt adds: “It also makes me worry: If we're losing this many manatees – and dead manatees are relatively easy to find and count – what other invisible losses are we missing?” (personal communication).

Ironically, the manatees face this spike of death and suffering in the wake of the Trump administration having downlisted their status from “endangered” to “threatened.” As a result, manatees are experiencing the current crisis with manatee recovery programs reduced (Rose, 2021). Two Florida representatives are scrambling to pass legislation to reclassify Florida manatees as endangered. Meanwhile, researchers have also been dismayed to find that manatee “critical habitat designation” has not been updated since 1976 (Center for Biological Diversity, 2021). Such habitat designation would involve the apparently not-so-iconic seagrass ecologies – ecologies that are indispensable for the manatees and have been decimated by ecocidal agriculture, other pollutants and a rapidly warming climate.

The Florida manatees' unfolding critical situation has been declared an “Unusual Mortality Event.” This declaration is intended to marshal attention and resources from officialdom to support the good people on the ground, who right now are fighting for manatees' lives and for the preservation of the subspecies.

Sirenians in the balance

Yet the only thing that is “unusual” about the current Florida manatee mortality event is that it is happening to the world’s most celebrated manatees. In all other ways, it is typical of what Earth’s dugongs and manatees have been increasingly experiencing since the extermination of Steller’s sea cow in the late 18th century. Sirenian populations have been blinking out and their ranges contracting, mostly under the radar. Unless people awaken to the finality and horror of human-driven extinction, this time of compounding scourges will see a rising tide of “Unusual Mortality Events,” both seen and unobserved, for Sirenians among many other species.

Because of the adverse and accelerating synergies between rapid climate change, sea-level rise, declining fisheries and increasing human populations (both spurring intensified poaching), dam construction and continued agricultural fertilizer and pesticide pollution, the plight of Earth’s Sirenians is expected to worsen. It deserves emphasis that their continued slaughter for food and other purposes is completely unsustainable. In the words of Helene Marsh and colleagues, “local populations of Sirenians cannot withstand human-induced mortality of even a few animals per year” (Marsh *et al.*, 2017: 348). The low growth rate of Sirenians – who start reproducing well into adulthood and bear only one offspring every two to three years – makes them extremely susceptible to human pressures. Conservationists and concerned Earth citizens must take urgent action to protect all dugongs and manatees who are still with us to carry them through the rough waters ahead.

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Confluence
Jennifer Downey

The Tennessee Valley Authority was founded in 1933 to modernize agricultural communities of the US Southeast through the construction of dams, river diversions and power infrastructure projects along the region's great rivers. These drastic changes to the rivers and their watersheds set off a cascade of effects to the riverine ecosystems. The species depicted here – the cerulean warbler, blue masked darter, little blue heron and great egret – are some of the many species whose habitat, range and populations have been significantly impacted.

From the artist: This series of oil paintings (entitled *Submerged*), ranging from in size from 12 x 24 inches to 52 x 90 inches, explores the effects of dams on rivers, their species and their ecosystems. In 2009, I began investigating the ways that humans physically alter the land, and I was amazed to learn how much we have, since ancient times, altered rivers and waterways. My work focuses on the redirecting, diverting and damming of rivers in the western US, the affected areas of the Tennessee Valley Authority project in the US Southeast, and the Brazilian Amazon. These paintings feature some of the many species affected by large-scale hydropower projects.

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Food and shelter
Jennifer Downey

The Puget Sound southern resident orcas rely on Chinook salmon as their primary prey, feeding on them year-round. In large part due to four migration-blocking dams on the lower Snake River in Washington, wild Chinook are at 10% of their historic numbers, threatening the survival of these 74 orcas. A proposal to remove the dams has moved through the courts, advancing a contentious legal battle that involves conservationists, public agencies, tribal nations, fishing interests and others.



Life cycle
Jennifer Downey

The Sacramento–San Joaquin River Delta in California has undergone massive changes over the last eight decades from dams and other alterations that have changed these two rivers' natural course, flow and hydrology. Chinook salmon, pictured here, have been in the headlines since the early 2000s because of plummeting population and spawning counts, partly due to dams along the rivers.

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Shifting territories Jennifer Downey

The Sacramento–San Joaquin River Delta in California has undergone massive changes over the last eight decades from dams and other alterations that have changed these two rivers' natural course, flow and hydrology. The Delta Smelt and the California Least Tern, both pictured here, are two species that are imperiled as a result of damming and river diversion upstream from the Delta...



Suspended Jennifer Downey

... The Swainson's hawk, western pond turtle and Smith's blue butterfly are endemic to these two rivers and are just three of the many other species whose habitat, range and population have been affected by dams in the region.

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Turbulence and fluidity
Jennifer Downey

The Puget Sound southern resident orcas rely on Chinook salmon as their primary prey, feeding on them year-round. In large part due to four migration-blocking dams on the lower Snake River in Washington, wild Chinook are at 10% of their historic numbers, threatening the survival of these 74 orcas. Further upstream, where the reservoirs behind the dams have flooded the river's shorelines, birds such as the American goldfinch have lost nesting grounds and habitat.

A proposal to remove the dams has moved through the courts, advancing a contentious legal battle that involves conservationists, public agencies, tribal nations, fishing interests and others.

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The moral imperative to reduce global population

Trevor Hedberg

Trevor is a postdoctoral scholar at The Ohio State University jointly affiliated with the College of Pharmacy and Center for Ethics and Human Values. He is the author of *The Environmental Impact of Overpopulation: The ethics of procreation*.

During the last decade, increased scrutiny of ecological disasters such as biodiversity loss and climate change has led some philosophers and environmentalists to examine the connection between population size and environmental degradation. Excessive consumption is clearly a central contributor to our eco-social predicament, but the sheer number of people on the planet also plays a substantial role in its severity. The paper highlights how both anthropocentric and non-anthropocentric ethical perspectives converge on the conclusion that we ought to reduce global population. It then considers what policy measures could be permissibly implemented to achieve this goal.

Keywords: climate change; overpopulation; sixth mass extinction; sustainability

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Earth's human population is approaching 8 billion. While the annual growth rate has been declining since its peak of 2.2 per cent in the early 1970s, the current growth rate of just above 1 per cent still translates to about 80 million people being added to the planet annually. The most recent projection by the United Nations Department of Economic and Social Affairs (2019) suggests that population growth will continue for the remainder of the century, and that our numbers will peak at nearly 11 billion.

An increase in human population size is not an intrinsically bad thing, but more people require more resources and produce more waste. Thomas Malthus (1798) and later Paul Ehrlich (1968) famously raised concerns about the potentially disastrous intersection of population growth and available food supply, but technological developments in agriculture have made it possible to feed far more people than anticipated. (Tragically, under-nutrition and malnutrition still affect hundreds of millions of people, but this is due not to the unavailability of food but to poverty – that is, the lack of purchasing power to acquire food or high quality food.)

During the last decade, however, concern about human numbers has resurfaced. Although ongoing environmental impacts such as climate change and biodiversity collapse are often viewed as solely the result of excess consumption (especially by inhabitants of the developed world), a significant factor driving the ecological crisis is the sheer numbers of people engaged in consuming activities. One million people polluting is bad, but 100 million people polluting to the same extent is 100 times worse. Population has aptly been called the “multiplier of everything” (Ryerson, 2010). All other things remaining equal, an increase in population size will proportionally increase environmental drawdown and degradation.

The connection between population size and environmental malaise has incited a flurry of recent work focused on the ecological and moral implications of ongoing population growth, and exploring the appropriate policies and personal proactive decisions in response.¹ Here, I survey two lines of reasoning that both lead to the conclusion that we ought to act to stop population growth and slowly reduce global population. One focuses on moral considerations tied to human interests and values; the other examines moral considerations in relation to nonhuman species and the natural world. I then turn to the policies we ought to enact in pursuit of long-term population reduction.

Anthropocentric moral reasons to reduce population

A basic ethical tenet is that it is wrong to cause unnecessary harm. When possible, we should avoid doing things that bring suffering to others. Unfortunately, we are on course to cause a massive amount of unnecessary harm to present and future people if current levels of environmental degradation continue unabated. Let me briefly list a few sources of that harm. First, the UN Food and Agriculture Organization projects that food production will need to increase by up to 70 per cent by 2050 (over 2010 levels) to meet the demand for food (Alexandratos and Bruinsma, 2012). Second, groundwater is being depleted at about 3.5 times the sustainable rate, and 1.7 billion people reside in areas where available groundwater or the ecosystems that depend on this groundwater (or both) are threatened (Gleeson *et al.*, 2012). Third, global climate change is menacing the life and welfare of people via sea level rise, increased frequency of severe weather events, ocean acidification (poised to reduce food productivity of the oceans) and increased vulnerability to disease as the liveable range of disease-carrying insects expands (Intergovernmental Panel on Climate Change, 2014a, 2014b). Fourth, biodiversity loss jeopardizes the existence of valuable ecosystem benefits – resources and other goods naturally provided at low cost by the natural world – and various other ‘goods,’ such as aesthetic appreciation and knowledge acquisition, that nonhuman species offer. The rate of species extinctions has accelerated so dramatically over the last century that scientists warn we are living through the Earth’s sixth mass extinction event (Barnosky *et al.*, 2011; Ceballos *et al.*, 2017).

One of the central causes of the environmental degradation that leads to these harms is excessive consumption, especially by those in the wealthiest, most developed parts of the world. However, the number of people engaging in

environmentally-destructive consumer behaviours is part and parcel of that equation. Moreover, in some regions of the world, countries must be supported to further develop – thus increasing their rates of harmful consumption – if they are going to supersede poverty and achieve a reasonable standard of living. The seeming intractability of reducing rates of destructive consumption – despite general agreement that this must be done – points to a further obstacle: people are often resistant, or at a loss as to how, to cut back on their consumption patterns. Intriguingly, this last obstacle is less daunting in the case of procreation. People voluntarily reduce their family sizes when certain sociocultural and economic conditions are met, with the low fertility rates of the countries in the European Union and elsewhere providing ample evidence of this fact.

Instead of focusing only on lowering consumption rates – an imperative that, practically speaking, appears insufficient to address the crises we face – I propose that we also do what we can, locally and globally, to lower fertility rates. To be clear, it is still urgent that we keep working to reduce waste, transition to sustainable energy, move to more plant-based diets and otherwise reduce overconsumption. My claim is simply that these endeavours, alone, will be insufficient, especially as a globally growing and wealthier population stands to overwhelm any gains in consumption behaviour we see. The superior approach to our ecological predicament is working to reduce *both* excessive consumption around the world *and* the number of people engaging in these behaviours.

Non-anthropocentric moral reasons to reduce population

The ethical argument sketched above – one that I have presented in greater detail elsewhere (Hedberg, 2020: 33–62) – is an anthropocentric argument, in that it appeals exclusively to human values and interests. But Earth's moral community is not limited to the human species. Numerous non-anthropocentric moral considerations lead to the same conclusion reached in the previous section.

As an initial example, consider the moral gravity tied to people's desire to eat meat, fish and dairy. Every year, over 70 billion land animals are slaughtered for human consumption (United Nations Food and Agricultural Organization, 2021). The overwhelming majority of these animals suffer substantially before their premature death. Since most human beings are not vegetarian, an increase in the number of people on the planet is leading to an increasing demand for meat and other animal products, which means more animals suffering and dying in confined animal feeding operations. The same population trends and dietary predilections mean more fish being harvested from the global ocean. When fish are extracted, they are counted by their weight (as a group) rather than individually, but the number of individual fish killed annually – suffering premature and violent deaths – may well be in the trillions.

Farm animals and fish are not the only living creatures on Earth. When we add to our consideration other wild animals affected by our oversized impact,

then the moral weight of our actions grows dramatically. How many wild species will go extinct due to agricultural expansion and climate change? What will be the fate of coral reef biodiversity by century's end? How many rainforest species will be lost – many even before we know of them – if humanity does not drastically change course? It is clear that the number of individual beings and life-forms affected adversely by our actions is staggering.

What's more, ecosystems themselves are morally considerable, both as homes ('habitat') for living beings and as unique creations via the interrelations between living beings and the abiotic environment. The conversion, fragmentation and disruption of ecosystems, as such, represents another wrongdoing in the wake of increasing numbers of excessively consuming human beings.

In sum, as we place greater moral weight on the lives of nonhuman creatures and the natural world more broadly, the severity of our moral wrongdoing grows. The imperative to respond to these environmental impacts becomes stronger, and so the need to reduce global population becomes even more urgent.

What can we do?

Whether reasoning about global population through an anthropocentric or non-anthropocentric lens (or both), the moral need to stymie population growth is evident. The challenge is how we achieve that without our efforts yielding morally unacceptable results. As mentioned earlier, concerns about population growth are not new. Unfortunately, part of the history of responding to population growth is tainted by instances of insidious eugenics programs, coerced abortions and forced sterilizations. The fraught history of these policies has led many to fear that it is impossible to respond to population growth without re-treading this trail of human rights abuses. The good news is that our options for responding to population growth are a far cry from being that bleak.

In considering possible ways of responding to population growth, I have found it helpful to group policy options into those that are *non-coercive*, *semi-coercive* and *coercive*. Non-coercive policies are those that do not infringe on people's autonomy; in fact, as I will explain, these policies increase people's autonomy. Coercive policies, in contrast, severely restrict people's autonomy, and cause harm, by imposing penalties for failing to engage in compliant behaviour. The human-rights abuses tied to certain previous efforts to address population growth are extreme examples of coercive policies. The third category is semi-coercive policies – policies that endeavour to steer people's behaviour to some extent but not in the same way, or to the same degree, as outright coercive measures.

Coercive responses to population growth are generally opposed due to the history tied to their use. (Conly [2016] is a notable exception: she supports the use of fines for noncompliance with a global one-child policy.) The lessons of the past do carry significant moral weight, but I also believe there is a practical reason to oppose coercive policies. Putting such population measures on the

table for public debate is very likely to be counterproductive: it would cause backlash against any population-oriented discourse and invite dismissal of the issue rather than political action. A better strategy is to pursue non-coercive and semi-coercive measures that people may well be willing to implement.

Fortunately, the greatest strides on population can be made through a range of non-coercive policies. Perhaps the most impactful would be to increase access to contraception, particularly in areas where fertility rates are high and many women lack reliable access to family-planning services. Globally, 40 per cent of all pregnancies are unintended (Sedgh *et al.*, 2014). Significantly reducing this percentage would have an incredible impact on global population. As one illustration, some UN officials reported in 2016 that meeting the contraceptive needs of Africa could reduce global population by 1 billion people by 2030 (Ford, 2016). Another non-coercive step would be to improve education in two ways. First, sexuality education could be improved, and instituted where it is absent, so that participants have a better sense of what methods of contraception are available, the importance of using them and the ways in which they can be used effectively. Second, we could enhance environmental education by including knowledge and discussion about the connection between family size and ecological footprint. Improving access to contraception would improve procreative autonomy by making it easier for people to decide when they want to have a child or children, if indeed they do. Providing people with accurate information about contraception and the effects of their procreative choices would also increase their autonomy because they would be able to make better-informed decisions. Pursuing gender justice by countering patriarchal norms and removing socio-cultural barriers that prevent women from exercising control over their reproductive decisions yields similar results: these women experience increased autonomy and choose to procreate at lower rates (on average) than they otherwise would (Crist, 2019: 185–213). Overall, there is an array of moral reasons to support these non-coercive policy measures and no moral downside to their implementation.

It remains an open question whether non-coercive measures alone would suffice to steer humanity toward population reduction with the swiftness that is necessary. Changes in fertility rates take a significant amount of time to translate into large-scale effects on population size, and our most robust responses to environmental problems like climate change and species extinctions need to occur as soon as possible if truly disastrous outcomes are to be avoided (or at least minimized). Thus, we should consider what semi-coercive measures would be morally acceptable to implement under the dire circumstances we find ourselves in.

One of the simplest and least controversial semi-coercive measures would be the use of media campaigns to raise awareness of the population issue and encourage more reflective deliberation about procreative decision-making. We already accept the use of similar campaigns to influence people's dietary habits, make certain careers more appealing or promote public safety. The aim of these initiatives is to influence or adjust people's preferences so that they will make different decisions than they otherwise would. So long as these

campaigns do not use deception to advance their aims, and the aims are morally good to pursue, there should be nothing objectionable about their use. Efforts to promote smaller families and the use of family-planning services via television and radio have led to lower fertility rates and increased uptake of contraception (Ryerson, 2012: 244–8), so optimism about their ability to shift people's preferences is warranted. Furthermore, such campaigns could also be directed to counteract pro-natalist stigmas, and related cultural coercion, that likely prompt women to have more children than they would if they had real choice. Both women and men often face a variety of sociocultural pressures that cause them to have more children than they otherwise would. Working to lessen those pressures may, as in the case of non-coercive measures, actually lead to enhanced procreative autonomy for many people.

A more controversial semi-coercive strategy for reducing fertility rates is incentivization. This strategy involves instituting policies that create incentives (*e.g.* tax breaks, direct financial compensation) for people to have smaller families. The recently proposed Uttar Pradesh Population (Control, Stabilisation and Welfare) Bill 2021 would be a clear example of an incentivization scheme aimed at lowering fertility rates. If this law is enacted, then people living in India's state of Uttar Pradesh who have more than two children will be ineligible for state government jobs, excluded from benefits provided by dozens of government schemes and unable to obtain further promotions if employed in state government at the time the law passes. Non-government workers who abide by the two-child limit will also be eligible for rebates on taxes, utility bills and home loans (Kuchay 2021). Would these policies be morally justifiable? An unambiguous answer is perhaps hard to determine.

Incentivization schemes, such as the above law, clearly run closer to being objectionably coercive than media campaigns, but they are also clearly less coercive than severe forms of one-child policies (where non-compliance might result in extreme fines, jail time or forced abortion). The bill also faces pushback concerning how effective it would actually be at lowering fertility rates and its potential unintended consequences (such as increased gender imbalance). Even so, India is one of the nations in the world most in need of policy measures that address its extraordinary population size. Given the severity of the problem – in a country that faces imminent freshwater scarcity – this policy proposal might be morally acceptable if its unintended negative consequences could be minimized.

As I have discussed at greater length in prior work (Hedberg, 2020: 75–8), the mandate to decelerate population growth may present us with a case of moral tragedy. It may be that there is no available course of action that avoids all unjust outcomes. If the population problem grows severe enough that it can only be managed through harsh incentivization programs, then responding adequately to the problem may inevitably lead to undesirable impositions. Has India reached that point? Without knowing the viability of other, less coercive, policy responses, it is hard to be certain. What is certain, however, is that complacency in responding to ongoing global population growth will

inevitably lead to morally tragic circumstances – ones where the only policies that prevent serious environmental degradation are those that cause some people to be victims of injustice. This serves to highlight the need to act sooner rather than later.

Given their potential moral downsides, incentivization schemes should not be our first move in trying to reduce global population. Such strategies can run uncomfortably close to coercion depending on who they impact and how they are implemented. Yet dismissing their use altogether would be a mistake. Some incentivization schemes may pose lower risks of causing injustice than others, especially those that involve merely bestowing benefits to certain groups of people or empowering women to make their own choices. Providing a tax rebate to small families is nowhere near as coercive as imposing a fine on parents with several children or jeopardizing those parents' employment. The latter measures penalize the parents of large families. A new tax break for parents in smaller families, however, does not impose a burden on the parents of large families: rather than creating an incentive by making the parents of large families *worse* off, it creates an incentive to have fewer children by making parents of small families *better* off. On the whole, I propose evaluating incentivization schemes on a case-by-case basis and resorting to them only when non-coercive means of responding to the population quandary have been attempted, or it can be determined that such means are insufficient to adequately address looming threats.

Human numbers will not start decreasing overnight, but we have the means to stabilize global population well before the end of this century. Once that is accomplished, our goal should be to reduce our numbers further. Doing so will play a crucial role in our ability to pass on a biodiverse world to future generations.

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Note

- 1 See, for example, Cafaro (2012), Cafaro and Crist (2012), Weisman (2013), Conly (2016) Rieder (2016), Coole (2018), and Crist (2019).

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Just population policies for an overpopulated world

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After three decades of neglect, environmentalists are waking back up to the need to limit human numbers. But like Rip Van Winkle, we find that the world changed while we were asleep. There are now billions more people, hundreds of millions of new members in the global middle class, and elevated consumption among the wealthy. Meanwhile the planet has grown warmer, more polluted, tamer and more depauperate. This article specifies what just population policies look like for an overpopulated world: one where most national populations must decrease significantly to create sustainable societies, and where failure to do so threatens environmental disaster for humans and the rest of life on Earth. It argues that governments in both underdeveloped and overdeveloped countries should encourage and enable one-child families and discourage larger ones, striking a proper balance between reproductive rights and reproductive responsibilities.

Keywords: ecological ethics; limits, overpopulation; sixth mass extinction; sustainability

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Human rights concerns loom large in population policy discussions. On the one hand, opponents of family planning efforts often point to human rights abuses, such as forced abortions under China's one child policy, to justify their opposition. Others who may approve of family planning argue that government programs that speak too enthusiastically about the environmental or social benefits of reducing population growth, or that set specific targets to reduce fertility, are prone to such abuses. From this perspective, the main human rights concern is that population policies not force people to have fewer children than they want to have, or punish them if they have more than the state wants.

On the other hand, family planning proponents often note that most social pressure and government coercion – now, as in the past – involves coercing women to have more children than they want. From this perspective, providing accessible and affordable contraception is necessary to operationalize a basic human right to reproductive choice, which is key to achieving freedom and equality for women. Hundreds of millions of women around the world are

unable to postpone or avoid pregnancy due to poverty, coercive laws, or opposition from religious leaders or other men.

Ecologically-minded citizens bring further human rights concerns to the table. Environmental degradation directly threatens many rights often taken for granted in wealthy societies, such as rights to sufficient food, water and shelter, and the right to basic physical security. Indeed, the environmental crisis indirectly threatens *all* human rights, since secure rights depend on a functioning social order, which rests on essential ecosystem services which humanity is rapidly degrading.

Beyond *human* rights concerns, other species arguably have a right to continued existence free from untimely anthropogenic extinction or excessive interference. Such non-human rights also are threatened by excessive and growing human numbers. For example, Rosenberg *et al.* (2019) report that approximately 2.9 billion fewer birds bred in Canada and the United States in 2018 compared to 1970. “Our results signal an urgent need to address the ongoing threats of habitat loss, agricultural intensification, coastal disturbance, and direct anthropogenic mortality,” the authors write, “to avert continued biodiversity loss and potential collapse of the continental avifauna.” All these threats are driven partly by human population increase: while bird populations in Canada and the United States declined 30 per cent, human populations increased 61 per cent over the same period (Figure 1). Habitat was destroyed to build houses, roads and other infrastructure to accommodate 138 million more people, agriculture was intensified to feed them, increasing pesticide and herbicide use and the poisoning of insects and wildlife, *etc.*

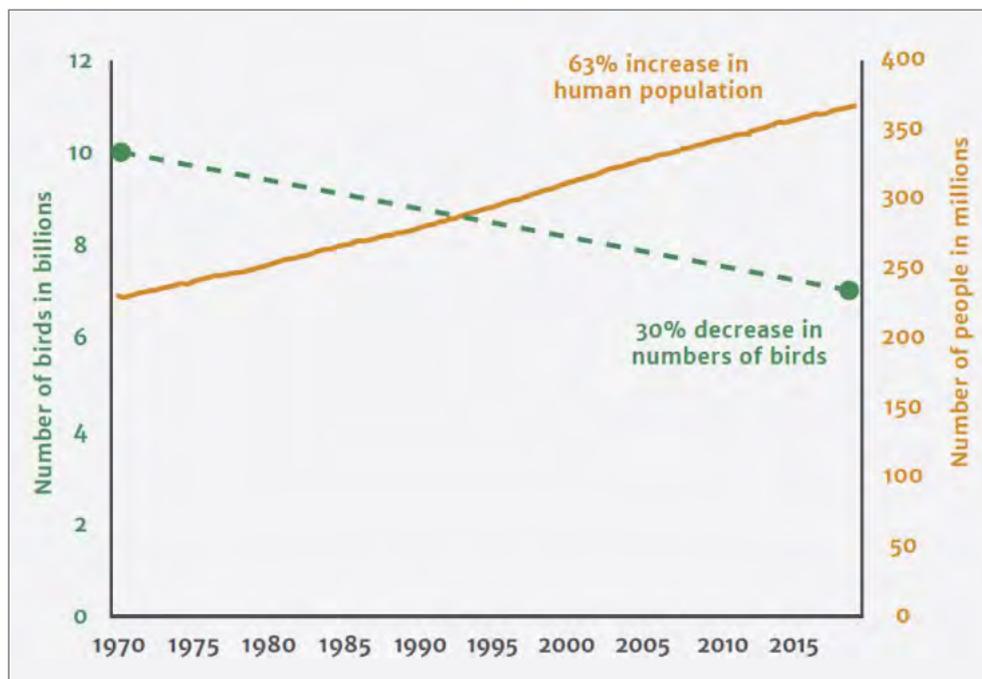


Figure 1. Change in bird numbers and human numbers in North America, 1970–2018. Sources: Rosenberg *et al.* (2019); United Nations (2019).

The rights against coercion discussed in the first two paragraphs can be secured by increasing reproductive freedom, while those rights discussed in the next two paragraphs may not be. Many countries have in fact achieved near-universal access to contraception while avoiding government coercion in how it is used. There is no inherent conflict between increasing people's freedom to have more children and their freedom to have fewer. But securing environmentally-dependent rights and other species' continued existence depends on limiting human numbers, not on how those numbers are chosen. And there is no guarantee that maximizing reproductive freedom will end human population growth.

Large family sizes remain the desired norm in many countries and among some religious and ethnic groups, while current preferences for small families in other places and among other groups may change. Furthermore, merely ending population growth will not limit human numbers sufficiently to secure environmental sustainability. The evidence – from global climate disruption, to dwindling wildlife populations, to the toxification of Earth's lands and waters – suggests the need for much smaller populations globally and in many individual nations. Three recent studies argue that two to three billion people might be sustainable globally if societies made heroic environmental improvements in existing modes of consumption and production (Lianos and Pseiridis, 2016; Tucker, 2019; Dasgupta, 2019). The current global population is 7.9 billion and growing by 80 to 85 million annually, as it has for decades. The heroic improvements have not been forthcoming.

Since all rights are environmentally dependent and securing them could be rendered impossible by overpopulation, any serious ethical analysis needs to consider limits on reproductive rights. Such a conclusion should not be surprising: ethicists and jurists have long held that no rights are absolute and particular rights find their proper scope within a comprehensive consideration of human interests. This need not mean that coercion is the proper recourse for dealing with overpopulation or excessive fertility (or any other problem for that matter). Non-coercive or less coercive policies are always preferable, *ceteris paribus*. Evidence from many parts of the world over the past half century shows that promoting the benefits of small families while making modern contraception widely available can lead to rapid, voluntary fertility declines (see, for example, <https://overpopulation-project.com/>). We should remain open to the happy possibility that more freedom, combined with greater understanding of the impacts of our reproductive decisions, will solve humanity's population problems – and to the possibility that they will not.

Rights and responsibilities

International human rights conventions and commitments provide a useful ethical framework for thinking about population matters. The UN's International Conference on Human Rights in Teheran in 1968 declared that “couples have a basic human right to decide freely and responsibly on the number and spacing of their children,” and that while sovereign nations were

free to design their own population policies, those policies should pay “due regard to the principle that the size of the family should be the free choice of each individual family” (United Nations, 1968). Meeting at the height of concern about the global population explosion, however, delegates also “observed that the present rapid rate of population growth in some areas of the world hampers the struggle against hunger and poverty” and impedes efforts to provide people with adequate medical care, educational opportunities and other social services, “thereby impairing the full realization of human rights” and “the improvement of living conditions for each person.” They thus urged member states and concerned agencies “to give close attention to the implications for the exercise of human rights of the present rapid rate of increase in world population.”

The Teheran Declaration balanced rights and responsibilities, individual freedom and the common good. It affirmed a right to decide the size of one’s family, while recognizing that continuing to have large families could be disastrous and that societies had better goals than maximizing sheer human tonnage. This approach left scope for nations to enact policies to limit population growth, so long as they respected their citizens’ right to determine the size of their families. It also opened the possibility of limiting that right to safeguard other rights, or further the public welfare. Teheran thus provided a reasonable ethical framework for judging population policies: one which supported choice-enhancing policies providing widespread access to modern contraception, condemned intrusive policies such as forced sterilizations, and allowed government programs that encouraged small families. This approach was reaffirmed by UN population conferences in Bucharest (1974), Mexico City (1984) and Cairo (1994), each of which declared couples had “a right to responsibly choose” when to procreate, while extolling the benefits of small families in a crowded world.

This balanced moral framework still seems fit to purpose, provided we renounce its anthropocentrism and commit to respecting the rights and interests of other species, not just humans. Otherwise, we risk the destruction of much of the world’s remaining biodiversity. As the UN’s Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) reported in its comprehensive *Global Assessment Report* (2019), “the global rate of species extinction is already at least tens to hundreds of times higher than the average rate over the past 10 million years and is accelerating” and “the proportion of species currently threatened with extinction according to the IUCN’s Red List criteria averages around 25 per cent” across all relevant taxa.

Ecological citizens insist on addressing this moral catastrophe, including through appropriate population policies, since human numbers play a crucial role in our ability to share Earth justly with other species. Again according to the IPBES (2019): “unsustainable use of the Earth’s resources is underpinned by a set of demographic and economic indirect drivers that have increased ... The global human population has increased from 3.7 to 7.6 billion since 1970 unevenly across countries and regions, which has strong implications for the degradation of nature. Per capita consumption also has grown.”

Affirming a proper balance between rights and responsibilities is part of enabling the flourishing of life in all its forms. I take life's flourishing to be the fundamental ethical value and thus the appropriate overarching goal of public policy. With this goal firmly in mind, what population policies should societies enact in an ecologically-stressed world nearing 8 billion people?

Moderate reforms?

Many argue that the best way forward is for governments to secure the right of couples to choose their family size, while strongly encouraging them to choose small families. In other words: coercion no, incentives yes; forced sterilizations no, frank reminders that we are overpopulated yes. This is the answer given in this special issue of *The Ecological Citizen* by Joe Bish and Robin Maynard; it is the answer given by many advocates for increased international family planning aid and by many committed environmentalists.

This approach has obvious strengths. It disarms a main criticism of family planning efforts by explicitly and unequivocally eschewing all coercion. It focuses on a genuine win/win aspect of the issue: providing access to contraception helps secure an important right for women and furthers gender equality, while the freedom to choose generally leads to smaller families and associated economic and environmental benefits. Even if more demanding policies might do more, in theory, to further the common good, this approach might be the best achievable. Asking our fellow citizens for more, we could get less. Finally, moderate reform provides some hope of addressing overpopulation. If most couples chose to have only one or two children and few couples chose to have more, many societies could end population growth relatively quickly and begin the necessary task of reducing their populations (assuming a willingness to limit immigration).

I have argued for such moderate policies in the past and continue to support them. However, I now think that they are insufficient and advocate more demanding policies as well. I support intrusive measures to reduce unsustainable consumption levels for the same reasons. Humanity is grossly overpopulated and consuming at patently excessive levels, threatening to create a dystopian future that will harm immense numbers of people, while wiping out much of Earth's remaining biodiversity. Such colossal injustices must be prevented.

Moderate population proposals fail to acknowledge how dangerous our environmental problems have become and thus fail to propose adequate solutions. They are like moderate climate change proposals that ask people to voluntarily retire their gas guzzlers while increasing subsidies for electric cars, or ask people taking their sixth airplane flight of the year to pay a few hundred dollars for carbon offsets. Such modest, voluntary measures will not decrease consumption sufficiently to adequately address climate disruption or our other pressing environmental problems. They normalize average consumption levels that cannot be accommodated ecologically. Societies should instead demand more from their citizens – for example, by rapidly phasing out gasoline-powered cars and limiting individuals to one or two airplane flights a year.

In the same way, moderate reformist population policies normalize unsustainable population levels. They treat citizens as children, who cannot be told the truth or asked to discipline themselves in response to reality. Societies should instead set population policies that have a reasonable chance of achieving sustainable population levels. Not immediately, like Thanos in *Avengers: Endgame*, but within a timeframe that allows us to do justice to future generations and our fellow Earthlings.

Overpopulation

But what are sustainable population levels, globally or for individual nations? That depends on numerous factors, including how luxuriously people want to live and whether they choose to share the landscape generously with wildlife. The higher the average level of consumption, the lower the sustainable human population (Lianos and Pseiridis, 2016; Tucker, 2019; Dasgupta, 2019). The more habitat and resources devoted to sustaining other species, ditto. As justice toward our fellow human beings has a cost, so does justly sharing Earth's lands and seas with other species.

Lianos and Pseiridis (2016) calculate that the world could safely accommodate 3.1 billion people living on an average annual income of \$9000, an amount deemed sufficient to sustain a materially satisfactory life. Ecological sustainability was determined based on remaining within the global constraints assumed by the Living Planet Index. They then calculated sustainable populations for the world's 52 most populous nations, on the premise that each country was entitled to a share of the sustainable global population equal to its share of global agricultural land. Table 1 shows the difference between current and sustainable populations for the world's five most populous countries based on these stipulations. It also provides recent population projections to 2100 for each country.

These sustainable national population numbers assume a willingness to limit or reduce average annual income to \$9000; at higher average incomes, the

	Population (2010), in millions	% share of the world's permanent cropland and arable land	Share of a sustainable world population, in millions	Required population change, in millions	Projected 2100 population, in millions
China	1337.7	8.17	253.2	-1084.5	1065
India	1205.6	11.0	341.0	-864.7	1450
USA	309.3	10.53	326.5	17.2	434
Indonesia	240.7	2.83	87.6	-153.0	321
Brazil	195.2	5.02	155.6	-39.6	229

Table 1. Population and overpopulation in the world's five most populous countries. Data in first four columns from Lianos and Pseiridis (2016), last column from United Nations (2019).

sustainable population decreases proportionally. Of course, many other things besides the availability of agricultural land factor into sustainability. Lianos and Pseiridis ignore, for example, the question of whether some agricultural land should be rewilded to benefit other species; doing so would decrease sustainable human population size proportionally. All that noted, their rough calculations give some idea of the amount of population decrease these countries would need to achieve sustainability. China and India together would need to decrease their populations by approximately 1.9 billion people.

Americans' average annual household income in 2020 was nearly ten times \$9000. This suggests its sustainable population might be only a small fraction of the projected 326 million, even with heroic efforts to decrease consumption – a heroism my fellow citizens are not noted for. At current average income levels, America's sustainable population would be 40 to 50 million. Looking at projected populations for 2100, none of these countries are anywhere close to achieving a sustainable population under status quo demographic and economic trends and policies.

Consider now Lianos and Pseiridis's calculations for sustainable populations for the seven most populous European nations (Table 2). Leaving aside Russia as a continent-sized outlier, the others would all have to cut their populations substantially to achieve sustainability: France by 40 per cent, Italy by 66 per cent, Germany by 70 per cent, the UK by a whopping 81 per cent – down from 63 million to 12 million people. All this, remember, with the stipulation of an average annual income of \$9000. With the extra income that most Europeans probably would want to retain, sustainable population sizes decrease proportionally.

This puts the perennial 'population versus consumption' discussion in proper perspective. To create sustainable societies, European nations would have to dramatically cut both. So would the United States and most other

	Population (2010), in millions	% share of the world's permanent cropland and arable land	Share of a sustainable world population, in millions	Required population change, in millions	Projected 2100 population, in millions
Russia	142.4	7.90	244.8	102.4	126
Germany	81.8	0.78	24.2	-57.6	75
France	65.0	1.26	39.0	-26.0	65
UK	62.8	0.39	12.1	-50.7	78
Italy	59.3	0.62	19.3	-40.0	40
Spain	46.6	1.12	34.6	-12.0	33
Poland	38.2	0.73	22.8	-15.4	23

Table 2. Population and overpopulation in Europe's seven most populous countries. Data in first four columns from Lianos and Pseiridis (2016), last column from United Nations (2019).

developed nations. Developing nations, meanwhile, face demands for more consumption by the poor, rising consumption by a burgeoning middle class and the same excessive consumption by the wealthy seen in the developed world. Here, too, sustainability demands greatly decreased human numbers and reduced consumption by those able to afford it.

The moral should be clear. If we want to create sustainable societies, we will need to decrease populations, reduce average consumption (at least in wealthier nations) and deploy less harmful technologies. All three – not one instead of the others. This conclusion holds whether we conceive sustainability as taking no more than our fair share of the global commons, or as creating societies that could be sustained on the territory they occupy. It holds regardless of how fairly we divide the sacrifices necessary to achieve sustainability. It even holds whether we choose to preserve our native biodiversity or not. The UK might be able to squeeze a few million more people onto its territory long-term by sacrificing its remnant wildlife, the US a few tens of millions more. But we would still need to cut our populations drastically to have any chance to create sustainable societies or do our part to create a sustainable world.

Just and realistic population policies

Current human populations are nowhere near compatible with long-term human wellbeing or the flourishing of life. These facts don't merely justify stringent efforts to reduce human numbers as quickly as humanely possible, they morally require them. These efforts must start not someday, somewhere else, but here and now in our own societies, and continue over the next few generations with a sense of urgency.

Overpopulation threatens massive suffering for billions of people and extinction for millions of species. It imperils life's flourishing, the ultimate value. This justifies the following ethical imperative:

- ***Would-be parents should restrict themselves to one child.*** More is socially irresponsible at this point in history. Many environmentalists already limit themselves to two children, replacement rate, out of environmental concern. But as we have seen, merely stabilizing current populations will not be sufficient to avoid environmental degradation and might not be sufficient to avoid environmental catastrophe.

These threats also justify the following public policies:

- ***National governments should guarantee their citizens universal, affordable access to family planning services, modern contraception and abortion on demand.*** When women are free to choose whether to bear children and couples can limit the size of their families, fertility rates usually decline, often rapidly.
- ***National governments should encourage their citizens to have only one child and discourage them from having more, through tax policies, safety net policies, direct propaganda and more.*** We cannot rely solely on personal, voluntary choices to secure environmental sustainability. We cannot allow

overly-fecund free riders to overwhelm the efforts of more responsible citizens. It won't work.

- ***National governments should strictly limit immigration, as part of comprehensive efforts to reduce their populations to sustainable levels as quickly as possible.*** Currently many developed nations have growing populations despite fertility rates that have been below replacement for decades. We cannot ask citizens to limit their numbers for the common good, while their governments undermine their efforts. Again, it won't work.

I am not proposing that governments harshly punish people who have more than one child, or end all immigration. I am proposing population reduction as a major policy goal for countries that are overpopulated, with targeted policies to reduce their populations, including financial incentives for one-child families and financial penalties for families with more than one or two children.

I confess to considerable unhappiness with this conclusion. These policies would entail significant costs to many would-be parents and immigrants. If they did not, they would not achieve their purpose. I would prefer not to have governments tell people where to live, or how many children to have. However, in the crowded world that humanity has created, such impositions are preferable to massive ecological degradation and all that implies. Failure to support such policies now means accepting great human suffering and a depauperate world in the future.

I support similarly intrusive policies to incentivize lower per capita consumption and prohibit excessive consumption. Not just a limit of one or two airplane flights a year, but a prohibition on owning personal aircraft, and so on down the line for all important categories of consumption. In these cases, too, it gives me no pleasure to stick my nose, or my government's nose, into such personal decisions. But I don't see any other path to achieving ecological sustainability.

Many will find these policy proposals overly restrictive, even unjust. The most common counterarguments are that they would violate human rights. It will be claimed that people have a right to choose the size of their families; a right to live and work where they choose, regardless of national boundaries; a right to own and fly airplanes, if they didn't break any laws in securing the money to buy them and can pass their flight tests.

But these proposed rights are claims on limited resources. If anything like the calculations described in Lianos and Pseiridis (2016), Tucker (2019) and Dasgupta (2019) are correct, a right to have more than one child cannot be universalized due to resource constraints. Not today and not for the next few generations here on planet Earth. This is enough to show that no such moral right currently exists, whatever our laws may say.

If we want to create societies where a moral right to have more children can exist in the future, we will need to endure a period where citizens are discouraged from having more than one child. Societies that fail to embrace

these policy recommendations may create conditions where no one has an effective right to raise any children. That is the path we appear to be on now.

A related argument holds regarding immigration, which involves individuals staking claims to limited resources in a new country. In a world that's overpopulated, a right to free international movement can undermine the right of future citizens to have a child, or the rights of future children to food, shelter and the stable civil order on which all rights depend. Starvation and the breakdown of civil society are forms of coercion, too, and arguably much worse ones than restrictions on immigration or procreation. Just as free-riding citizens cannot be allowed to undermine national efforts to achieve sustainability through excessive fecundity, neither can free-riding non-citizens, or free-riding nations. Once again, I believe similar arguments hold regarding overconsumption, and that public policy and international environmental treaties should reflect that reality.

I make no claims about the acceptability of these population policy proposals to the general public. Americans and Europeans, the groups with whom I am most familiar, know little about the connections between human numbers and sustainability. Americans have been so coddled and confused in recent decades that our ability to discipline ourselves to further the common good is close to nil. My sense is that Europeans are in somewhat better shape as functioning citizens, but whether they might seriously consider such proposals is doubtful, at least for now. All I claim for my proposals is that they are the right thing to do and that this will become clear in time, should they not be put into practice.

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Criticizing Muir and misunderstanding the foundation of American nature conservation

Bruce A Byers

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The recent controversy within the Sierra Club about whether their founder, John Muir, held racist views provides a useful opportunity to examine a much more important issue: the anthropocentric worldview that is the root cause of the global environmental crisis. The claims against Muir are easily refuted by a thorough and fair reading of his work; they are based on out-of-context quotes and revisionist interpretations of his early writings. But those claims give rise to a harmful misinterpretation of the history and philosophy of American nature conservation. The founders of American conservation had all been influenced by the life and work of Alexander von Humboldt. Muir, Thoreau, and all of Humboldt's other acolytes were slowly constructing a new ecological worldview that combined science, philosophy, aesthetics and spirituality. They were revolutionaries, far ahead of their times in arguing against human domination of nature or other humans. The real unfinished business of the environmental conservation movement is the need to overthrow the dominant paradigm of human supremacy and adopt an ecocentric worldview that can heal the human–nature relationship and create a society in which justice and reconciliation within the whole biotic community can occur, including within the human species.

Keywords: anthropocentrism, conservation movement

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The Sierra Club, one of America's premier nature conservation organizations, was founded in 1892 by John Muir and a group of mountain-loving friends. In July 2020 the Sierra Club's executive director, Michael Brune, wrote in a public post on the organization's website that John Muir was a racist who disparaged African Americans and Native Americans (Brune, 2020). Many of us who have been inspired by Muir were horrified, because this claim seemed so contrary to what most Muir experts knew about

him. Then, in March of this year, an essay in *Sierra* magazine by Rebecca Solnit titled “Unfinished business: John Muir in Native America” amplified the claim that Muir held negative views of Native Americans (Solnit, 2021). By August 2021 the controversy about Muir and racism in conservation that had been swirling behind the scenes broke into the open with an article in *Earth Island Journal* by some members of the Sierra Club board, who took issue with the criticism of Muir and his legacy (Mair *et al.*, 2021; Colman, 2021).

The debate about Muir’s supposed racism toward African Americans and Native Americans is not worth spending much time on, although I will consider it briefly below. But it is the tip of a dangerous iceberg. The real issue is that those claims give rise to a harmful, revisionist misinterpretation and mischaracterization of the history and philosophy of American nature conservation. The recent controversy within the Sierra Club provides a useful opportunity to examine this bigger, more important issue.

The founders of American nature conservation were far ahead of their time; many of their views on conservation are as relevant and valid now as they were in their time. Beginning almost two centuries ago, writers, philosophers, scientists and conservationists – including Muir – started to piece together a non-anthropocentric worldview to counter the dominant human-centered worldview that they understood to be driving the rapid destruction of North America’s natural landscape. That new worldview is the real ‘unfinished business’ needed to save nature’s diversity and resilience and that of our own species. Ironically and unfortunately, revisionist interpretations of the history and philosophy of American nature conservation will hurt, not help, the adoption of an ecocentric worldview and the transformation to a culture and society grounded in it.

Was Muir a racist?

Before examining the deeper issues, we should dispense with the claims that Muir was a racist who saw African Americans and Native Americans as inferior. Those claims simply misrepresent the evidence; they are based mainly on out-of-context quotes and revisionist interpretations of Muir’s early writings and are easily refuted by a thorough, properly contextualized and fair reading of his work.

The claim of racism against African Americans, for example, comes mainly from a selective and biased reading of *A Thousand Mile Walk to the Gulf* (1916). This is Muir’s account of walking from Indiana through Kentucky, Tennessee, North Carolina, and Georgia to Florida in 1867 and 1868, only a few years after the end of the Civil War. He hitched wagon rides with African American farmers, was invited to share meals and stay overnight in their houses, and described them as intelligent and “eloquent in no mean degree” (p. 6), courteous and generous, and said that they appear always “to be delighted to find opportunity for obliging anybody” (p. 83). In contrast, in that book he described some of the Euro-Americans he encountered on his journey as dangerous (p. 17), “primitive” (p. 37), and prejudiced (p. 59). He called a group of loggers he met in Florida “the wildest of all the white savages I have met. The long-haired ex-guerrillas of the mountains of Tennessee and North

Carolina are uncivilized fellows; but for downright barbarism these Florida loggers excel” (p. 95).

As for the claim that Muir looked down on Native Americans, although in some early writings he described the few he met in negative terms, when he finally came in contact with relatively intact Native cultures in Alaska, he quickly developed a deep respect for their ecological knowledge and skills (Barrett, 2019). In their commentary on the issue in *Earth Island Journal*, Sierra Club board member Aaron Mair and his coauthors say that “Muir wrote repeatedly about ... how traditional Indigenous peoples lived in peaceful coexistence with wild nature, while he described White settlers as selfish, base, and lacking honor” (Mair *et al.*, 2021). Although he sometimes did express his dislike of sloth and slovenliness (*e.g.* Muir, 1916: 67), that did not seem to have a racial basis, and perhaps should be expected from someone with a strict, Scots Calvinist upbringing like Muir.

Humboldt’s influence on American nature conservation

Before turning to the more significant issue of the misreading of our ecological ‘ancestors,’ it is important to note that they were all acolytes of Alexander von Humboldt (1769–1859), the path-breaking German explorer, scientist and writer. Over more than a century, Muir and all of Humboldt’s other followers were slowly piecing together a new, ecological worldview that combined science, philosophy, aesthetics and spirituality. It was a slow but coherent cultural rebellion against the Western, anthropocentric worldview of their times. To understand Muir’s work, we need to see him as part of that rebellion, not a lone pioneer.

Humboldt was the most popular, widely-read scientist of his day, and every one of the founders of American ecological philosophy and nature conservation had been influenced by him (Humboldt, 1997; Sachs, 2006; Walls, 2009; Wulf, 2015). We are finally coming to realize what a profound influence he had on science, nature conservation and art. Humboldt was an inspiration to natural scientists like Charles Darwin, Alfred Russell Wallace, Asa Gray and Louis Agassiz; ethnographers and anthropologists like Prince Maximilian of Wied-Neuwied and Franz Boas; nature writers and philosophers like Ralph Waldo Emerson, Henry David Thoreau, John Muir and John Burroughs; and artists like George Catlin and the many landscape painters of the Hudson River School such as Thomas Cole, Frederic Edwin Church, Thomas Moran and Edward Bierstadt (Byers, 2021).

Besides being an explorer and scientist, Humboldt was a moral and political activist. He wanted to make the world a better, more moral place. His thought touched on philosophical and ethical questions about the relationship of ecology and society, and his followers – including Muir – continued to seek answers to those questions.

An untrammelled wilderness inhabited by Native Americans

The charge that Muir was biased against Native Americans is linked with a broader accusation – that he, and other conservationists of the day, pictured

North America as an empty, unpopulated wilderness with no, or few, native inhabitants, and tried to ‘erase’ knowledge of the indigenous presence and its ecological effects (Cronon, 1995; Gilio-Whitaker, 2020; Solnit, 2021). These critics use this claim to try to debunk the very idea of wildness and wilderness, arguing that there is no such thing because every part of the planet except Antarctica has been inhabited by humans for millennia.

However, Muir and other conservation founders knew full well that North America was fully inhabited by native peoples who shaped its ecosystems, but also lived within them sustainably. Thoreau, for example, knew about Native American burning practices and their ecological effects on the forests around Walden Pond (Walls, 2017) more than a century before environmental historian William Cronon wrote about it (Cronon, 1983). Humboldtian ethnographic explorers like Prince Maximilian and painters like George Catlin documented Native American habitation of the continent in the 1830s. Hudson River School painters, beginning with Thomas Cole in the 1830s and continuing to later generations like Albert Bierstadt in the 1870s, pictured Native Americans in ways that alluded to their harmony and ecological integration with the land. Photographers like Edward Curtis exalted Native American cultures. Franz Boas and his legion of students documented the cultural and ecological sophistication of Native Americans (King, 2019). Those who argue that the history and evolution of American ideas of nature, wilderness or nature conservation ignored Native Americans simply haven’t done their historical homework.

For example, in her recent essay in *Sierra*, Solnit noted that Muir spoke effusively about the “gardens” of nature, and in particular the landscape of the Yosemite Valley, but claimed that he must not have been aware that Yosemite and other California landscapes were the work of Native Americans “gardening” with fire (Solnit, 2021). In fact, Muir knew that Native Americans had shaped the ecological landscape of the Yosemite Valley, and the rest of the continent. He spent some of his formative years at a homestead at Fountain Lake in east-central Wisconsin, where the Muir family arrived in 1849. The area had been recently opened for Euro-American settlement after US soldiers defeated Native American resistance to the annexation of their traditional lands in 1832. Muir later wrote effusively in *The Story of My Boyhood and Youth* (1913) about the beauty and biodiversity of the “oak openings” around Fountain Lake. He saw how that beloved landscape changed over the decade after he arrived, as Native American burning and hunting practices were supplanted by Euro-American agriculture (Byers, 2016). In *My First Summer in the Sierra* – the same book in which he talked about the “gardens” of Yosemite – Muir (1911: 73) wrote as follows:

How many centuries Indians have roamed these woods nobody knows, probably a great many, extending far beyond the time that Columbus touched our shores, and it seems strange that heavier marks have not been made. Indians walk softly and hurt the landscape hardly more than the birds and squirrels, and their brush and bark huts last hardly longer than those of wood rats, while their more

enduring monuments, excepting those wrought on the forests by the fires they made to improve their hunting grounds, vanish in a few centuries.

A perverse reading of this passage might charge Muir with being paternalistic or even racist for comparing Native Americans to animals – which Muir clearly loved!

The founders of the American nature conservation movement didn't imagine an empty, uninhabited continent; instead, they saw with their own eyes an *untrammelled* continent, with natural ecosystems still functioning and intact. The operant phrase in the definition of “wilderness” in the Wilderness Act of 1964 is “an area where the earth and its community of life are untrammelled by man” (<https://uslaw.link/citation/us-law/public/88/577>). That is precisely what the early proponents of nature conservation saw and documented across most of North America, even as they also saw and described it as fully occupied by indigenous peoples. Native American cultures, with their relatively sparse populations, high dependence on hunting and gathering wild foods even if engaged in agriculture, and ecocentric worldviews that tended to hold their ecological impact in check, were almost universally ‘untrammeling’ societies. With the colonization of the Americas by Europeans, who brought with them the agriculture and other technologies that had destroyed natural ecosystems and driven human population growth above carrying capacity there – not to mention their human-supremacist worldview that encouraged their ecological impact (White, 1967) – the trammeling of North American ecosystems began.

Re-spiritualizing nature

The founders of American nature conservation *did* try to re-spiritualize our view of nature. Perhaps the rebellion against a sterile, desacralized view of nature started with Humboldt and his unified-field, “cosmos” thinking (Humboldt, 1997) – an approach which was portrayed with aesthetic passion by Thomas Cole and the other Hudson River School painters, for example. It then was pushed further by the Concord Transcendentalist nature philosophers, Emerson and Thoreau, who gathered fuel for their radical ideas from the Stoics, Emanuel Swedenborg, Hindu scriptures and Buddhist sutras. American nature philosophers were rediscovering or recreating – from scientific, indigenous, ancient and Asian sources – the aboriginal worldviews of America, in which nature was spiritual and sacred.

Muir was a leader in this movement to restore the spiritual status of nature. Describing his solo ascent of Cathedral Peak in Yosemite in *My First Summer in the Sierra*, he wrote “This I may say is the first time I have been at church in California, led here at last, every door graciously opened for the poor lonely worshiper. In our best times everything turns into religion, all the world seems a church and the mountains altars” (Muir, 1911: 336).

A year after climbing Cathedral Peak, in the autumn of 1870, Muir wrote to his friend and mentor Jeanne Carr from Yosemite, using a brown ink that he had made by steeping the bark from a giant sequoia (Muir, 1870). The letter is

playful, and completely free and un-self-censored. Combined with his description of being “at church” on Cathedral Peak, it shows how far Muir’s views of religion had evolved since the harsh Calvinist upbringing of his youth. In the letter he wrote:

Some time ago I left all for Sequoia. I have been & am at his feet fasting & praying for light, for is he not the greatest light in the woods – in the world. ... I’ve taken the sacrament with Douglass Squirrels, drunk Sequoia wine, Sequoia blood, & with its rosy purple drops I am writing this woody gospel letter. ... I wish I was so drunk & sequoical that I could preach the green brown woods to all the juiceless world, descending from this divine wilderness like a John Baptist eating Douglass squirrel & wild honey or wild anything, crying, Repent for the Kingdom of Sequoia is at hand.

This letter would be blasphemous if Muir really still believed in the Christian tradition in which he was so strictly raised.

Muir’s worldview, as expressed in his writing, was much more congruent with those of the Native American inhabitants of California than with the worldviews of the Euro-American society in which he lived. In traditional Native American cultures, and for Muir, landscapes were seen as spiritual and sacred, and non-human species were viewed as our kin. Muir often referred to “plant people” (e.g. Muir, 1911: 208; 1916: 156) and “animal people” (e.g. Muir, 1898: 21) in ways reminiscent of Native American perspectives. Perhaps the many nights Muir spent alone in the wilderness settings that Native American peoples experienced enabled him to channel their vision and ecocentric worldview. Anyone who accuses Muir of not understanding or honoring America’s indigenous peoples hasn’t understood his philosophy at its depth.

The relationship of anthropocentrism and social justice

We live in a society of systemic human supremacism, enshrined in the humans-first worldview of the Middle Eastern monotheistic religions (Judaism, Christianity and Islam) and the colonizing, expansionist empires of the Mediterranean and European world. In that dominant, human-supremacist worldview, nature is ‘other,’ and ‘man’ is granted ‘dominion’ over all of it. Many authors have argued persuasively that this anthropocentric worldview is the root cause of the global environmental crises we are experiencing today (White, 1967; Naess, 1972; Nelson and Sauer, 2016; Crist, 2019; DeJonge, 2021).

Where do issues of social justice, such as racism, stand in relation to this deeper view of ecological ethics? Crist argues that the dominant worldview of human supremacy creates or enables the conditions for racism and other kinds of social injustice. “The bedrock of nature colonialism on which civilization stands has built perpetual violence into its very edifice,” she writes. As long as ecosystems and non-human species are treated as merely “resources” to be exploited for human benefit, competition for those resources will ensure that “social injustice and inequality will continually rehearse themselves in one

form or another” (Crist, 2019: 246). In contrast, as Arne Naess (the Norwegian philosopher credited with coining the term “deep ecology” in 1972) wrote, an ecocentric rather than anthropocentric worldview supports “diversity of human ways of life, of cultures, of occupations, of economies,” promotes “the fight against economic and cultural, as much as military, invasion and domination,” and is “opposed to the annihilation of seals and whales as much as to that of human tribes or cultures” (Naess, 1972: 96).

The idea of deep-ecological justice echoes that of another important ecophilosophical voice, the poet Gary Snyder. Snyder also believed that the most fundamental revolution needed to bring about our transformation to an ecological civilization was the overthrow of human supremacy. In his poem “Revolution in the Revolution in the Revolution” (1970: 39), Snyder wrote:

*The country surrounds the city
The back country surrounds the country*

*“From the masses to the masses” the most
Revolutionary consciousness is to be found
Among the most ruthlessly exploited classes:
Animals, trees, water, air, grasses*

John Muir rebelled deeply and resolutely against anthropocentrism. His writings show the evolution of a nature-based spirituality that is strikingly congruent with that of the Native American cultures of the continent and the Californian bioregion that he came to call home. He and his ecophilosophical forebears were revolutionaries, far ahead of their times (in the Western world, at least) in arguing against human domination and advocating for an ecocentric worldview.

In their response to the Muir-as-racist controversy, Aaron Mair and his coauthors wrote of Muir that “In all, he kickstarted a new era of environmentalism, fueled by ideals that are still relevant as we continue to face a series of ecological crises. ... More than a century later, we are seeing the consequences of the failure of human societies to recognize the values Muir espoused” (Mair *et al.*, 2021). At the core of the “values Muir espoused” was ecocentrism and justice for all species and all of nature.

In a letter to his friend Alden Sampson in 1904, Muir ecocentrically extended the sentiment regarding human equality expressed in Scots poet Robert Burns’s poem “A Man’s A Man For A’ That” to non-human species – “our horizontal fellow-mortals” as Muir called them – writing “I fondly hope & pray that the present feeble glimmering light on the rights of our horizontal fellow-mortals may grow in brightness over all the world until man to man & man to beast shall brothers be an a’ that” (Muir, 1904).

The Sierra Club and other conservation organizations have worked to bring people into contact with nature, and to protect wild nature and wilderness to bring them into contact with, thereby contributing to the evolution and adoption of an ecocentric worldview. To criticize that work shows a lack of

understanding of what is really needed. The attack on John Muir is a misplaced and counterproductive attempt to appeal to (or appease) a subset of the Sierra Club's members. It could hurt their work and that of other environmental conservation organizations toward the real 'unfinished business': the adoption of an ecocentric worldview that can heal the human–nature relationship, and create a society in which justice and reconciliation within the whole biotic community can occur, including within the human species.

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Continuous dissent and the limits of reason: Ecocentric decision-making for resistance

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Any action or social movement whose goal is to protect biodiversity and halt mass extinction must be guided by decisions that navigate irreducibly complex interconnections between human groups and the ecological systems that these groups may protect or destroy. Complex systems theory provides models for navigating and understanding these highly interconnected systems, but these models are extremely unintuitive for people immersed in the humanistic cultural constructs (of language, cosmology and identity) that pervade modern society. Complex systems theory also provides a basis for understanding how collective human behaviour is influenced by shared stories or myths. Successful resistance to ecocide must not only physically prevent further ecological destruction, but also re-shape the stories that coordinate and influence collective human behaviour. This implies that groups who actively resist ecocide cannot themselves be guided by the humanistic stories that shape ecocidal behaviour. Rather, these groups should be guided by *continuous dissent*: a form of perception that allows non-rational direct perception of instructions and messages from more-than-human ecological wholes.

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In order to halt mass extinction, individuals and social movements must resist both powerful corporations that actively cause harm and the legal systems that protect those corporations. These destructive forces are highly interconnected and multi-national; the ecological systems they act upon are also strongly interconnected with one another, with human economic systems, and with the resistance movement itself. Successful resistance must be guided by ecocentric decision-making that is capable of navigating this complex interconnectivity.

Complex systems theory provides a basis for such decision-making. It is an interdisciplinary, non-reductive, ecological paradigm useful for navigating the

truly unfathomable interconnections between refuges of biodiversity, global economic systems that destroy those refuges, and social movements that protect them. This paradigm thus has the potential to inform wise action to protect biodiversity. In view of this potential, this article explores some of the key barriers to understanding and implementing complex systems theory as a guiding principle for ecocentric decision-making.

One key barrier is the predominance of *humanistic* cultural constructs. Following Merriam-Webster, 'humanism' can be defined as:

a doctrine, attitude, or way of life centred on human interests or values ... that usually rejects supernaturalism and stresses an individual's dignity, worth, and capacity for self-realization through reason.

This anthropocentric emphasis on *individual* human self-realization is incompatible with complexity. This is because, for complex systems theory, we are inextricably part of various human and more-than-human systems, and these larger wholes are ontologically and epistemologically necessary to explain the behaviour of any system's parts. In other words, to consider an individual human outside of these systems is a futile abstraction. Furthermore, humanism's emphasis on *reason* may limit our understanding when complex interconnections render rational abstractions useless for describing certain phenomena.

If ecocentrics are to act upon (or even fully understand) the implications of complexity, we must overcome the humanistic constructs that shape our language, science, cosmology and identity. These broad constructs shape the *format* of our thought by imposing humanistic containers upon otherwise ecocentric thought *content*.¹ These containers may shape our decisions even when we strive toward ecocentric action (as in the case of well-intentioned but ultimately destructive actions by humanistically-oriented environmental groups).

If we acknowledge the complexity and interconnectivity of human and ecological systems, then we should acknowledge that humanism's hyper-individualism and hyper-rationalism may produce misunderstandings and harmful action. Given the depth to which humanism penetrates our consciousness, it may also be useful to conclude that humanistic cultural constructs actually distort our perception.

Shared stories and decision-making

Collective human behaviour can be described by complex systems theory. For example, Eisler (1987) synthesizes complex systems theory with archaeological evidence in her Cultural Transformation Theory: a model for understanding collective human behaviour as an oscillation between two essentially stable cultural states of *domination* and *partnership*. Cultural Transformation Theory, and other frameworks that use complexity to describe human behaviour, emphasize that human decisions are partially determined by the groups we belong to, and the stories that bind those groups together. These groups are culturally constructed through such shared stories, and even biologically

definable groups (*e.g.* sex) may have culturally constructed definitions (*e.g.* gender). Oftentimes one group may oppress another (*e.g.* patriarchy), and complex systems theory models these relationships as a single group defined by a dialectic of oppressed–oppressor. This approach is borne out, for example, by Brazilian educator Paulo Freire’s success in liberating oppressed people by illuminating their internalization of the oppressors’ stories (Freire, 1970).

Thus, collective human behaviour – including oppressive and self-destructive behaviour – is partially determined by shared stories that define our group identities and predispose us to that behaviour. Notable examples of dysfunctional stories are: gender (Eisler, 1987); progress (Hine and Kingsnorth, 2009); hyper-reductive science (Bateson, 1979; Bohm, 1980); and humanism in general.

This partial determination of our behaviour should not be construed as an argument against free will: a discussion about struggle or resistance cannot be meaningful without some degree of free will. However, the inescapable influence of these stories upon our behaviour implies that a resistance movement will not be successful simply by preventing physical destruction of biodiversity (*e.g.* by blocking pipelines, mines and developments). Such protective actions are obviously necessary, but a decisive end to ecocide also requires that our actions of resistance lead to a substantial retelling of the stories that shape society as a whole. That is, successful ecocentric resistance must arise from *both* material protective actions *and* the telling of new (non-humanistic) stories through the symbolic interpretation of those actions.

Complex systems and the limits of rational analysis

It is not possible for protectors to rationally determine the correct strategy for materially defending ecosystems against destruction, while also positioning themselves for the best symbolic interpretation of those actions by the general population. It may be possible to assess and manage how a particular project of resistance (*e.g.* disabling a pipeline) will be perceived in the short term by the general population. However, it is not possible to know how that project might, over the longer term, be symbolically connected to simultaneous and future events – many of which are inherently unpredictable (*e.g.* natural disaster, other resistance actions, refugee movements, technological developments); nor is it possible to predict its broader effects upon prevailing ecocidal narratives.

This is because there are theoretical limits to the capacity of any rational analysis to predict the behaviour of large and complex systems. Random events affect complex systems in ways that are theoretically unpredictable (Taleb, 2012). More generally, Prigogine (1980) and others have shown that even apparently tiny disturbances can produce profoundly deep qualitative changes in complex systems. Finally, Damasio (1994) has presented neuroscientific evidence indicating that humans are never fully rational, even when we think we are. This all suggests that attempting a purely rational analysis of complex systems is futile, and that, as a consequence, humanistic hyper-rationality may lead to harmful action.

Messages from larger wholes

An ecocentric perspective should maintain awareness that individual humans only exist within the context of more-than-human systems. Many pre-colonial societies were cognisant of this – finding the idea of abstracting individual humans from larger tribal or ecological contexts to be virtually unintelligible – but centuries of humanistic thinking have eroded this holistic perception (Cajete, 2000).

If we maintain ecocentric mindfulness of our place as a part within larger ecological systems, we might find it reasonable to expect messages from those systems that can help to guide our decision-making. After all, we can observe that most natural systems are coordinated by information that belongs to the system as a whole. For instance, fungal networks centrally coordinate behaviour of trees in a forest (Sheldrake, 2020). When we receive such messages, they may appear to us as random events, so in order to recognize them as messages, we would first have to successfully interpret meta-messaging that identifies them as non-random information. That accomplished, these messages should form a useful basis for all kinds of wise action.

Messages from a larger ecological whole originate from a frame of reference that is larger than our own. This means that although we may be able to receive and act upon these messages, the entirety of their meaning may not be available to us. In comparison, a cell receiving a neurotransmitter has no understanding of the complex series of stimuli that released the neurotransmitter in the first place, but the cell can still respond to this chemical message in a way that promotes the overall function of the organism. Similarly, it is reasonable to expect that we should receive messages from a larger ecological whole that can guide wise action, but that we will not have enough information to fully understand how these messages relate to larger patterns that remain outside our frame of reference.

Given our necessarily limited perspective, rationality may not be a useful tool for recognizing or understanding such messages from the larger ecological whole. This runs directly against humanism's exaltation of rationality as the sole means for understanding ourselves and our world. More broadly, humanism's anthropocentric focus on human interests, individualism and self-realization through reason alone, stands in the way of our perception of, and submission to, messages from more-than-human ecological wholes.

From the limits of reason to continuous dissent

We have seen that complex systems theory suggests that a purely rational analysis will not always be an effective guide for navigating complex human and ecological systems. This is emphatically not to say that rationality is bad or useless – only to say that it, like any other human capacity, has *limits*. We should apply rationality in those domains where it is applicable but adopt other approaches when rationality is not helpful. Rationality is a tool, like a hammer. Hammers are good for pounding nails, but are not useful for fixing radios. Rationality is good for engineering results within limited domains and for

communicating with other humans, but, as I have argued above, it is not useful for understanding our own roles within complex ecological systems. When we are navigating complex systems, there may be times when it is more meaningful – and, even, more *scientific* – to adopt an animist perspective that treats ecologies, economic systems, whole groups of humans and other complex systems as autonomous wholes, with minds and wills of their own (Bateson, 1979).

Holistic perception of every ecological system as a communicating mind (instead of a mechanical system reducible to its parts) is what I am calling *continuous dissent*. The word dissent derives from the Latin roots ‘dis’ (meaning ‘different’) and ‘sentire’ (meaning ‘to sense, feel or perceive’). My use of the term ‘continuous dissent’ is thus meant to suggest a shift in perception that results from a continuous awareness of irreducible complexity, and vigilance regarding unconscious and inextricable biases imposed upon our thought through the humanistic constructs of language, identity and so on. This form of perception is honest about our limited capacity to make rational decisions, and also about the intrinsic limitations of rationality for understanding real world ecological systems. I emphasize the continuity of dissent, because dissent is not mutually exclusive with reason. As noted, rationality is a tool that can be adopted or abandoned depending upon need; dissent, on the other hand, needs to remain continuous.

Continuous dissent is a commitment to a holistic animist worldview. Unfortunately, we lack contemporary animist stories appropriate for coordinating people to protect dwindling biodiversity from rapacious multinational corporations and the humanistic legal systems that facilitate ecocide. Indigenous groups (and others) still possess important stories appropriate for this task, and these stories will indisputably play an important role in coordinating ecological resistance, but it seems unlikely that any existing stories will suddenly become sufficient to halt mass extinction. The goal of ecological resistance guided by continuous dissent is to tell these missing and needed stories through actions that protect biodiversity.

I am thus suggesting that successful protection of the natural world will depend upon small numbers of humans receiving, understanding and acting upon messages from larger ecological systems. These actions could only arise from a substantially different way of perceiving the world – namely, from a perspective in which ecological systems are capable of sending messages in the first place. In this way, continuous dissent is both an animist worldview and a strategy for resistance.

Resistance

Continuous dissent is resilient in the face of the legal system’s formidable forces of rationalized human supremacy. Environmental impact statements, permitting agencies, police forces and other legal constructs exist to enable human exploitation and destruction of the natural world – though our hyper-rational humanist paradigm casts them as protections. It is clear that when corporations have legal rights and the natural world does not, then the natural world will be destroyed.

If continuous dissent were thoroughly integrated into the legal system (for instance by passing comprehensive ‘rights of nature’ legislation, or by providing legal protection for indigenous spiritualities and land rights) there would be economic breakdown. The basis of our extractive industries would collapse (including industrial agriculture). This makes the enactment of such protections highly unlikely. For example, even when poisoned drinking water motivated residents of Toledo (OH, USA) to enact legislation asserting the rights of the Lake Erie watershed to “exist, flourish, and naturally evolve,” federal courts invalidated the legislation, claiming that it was ‘vague’ (Falk and Butler, 2020). In fact, the legislation was not vague; it merely expressed a dissenting view on anthropocentric assumptions about human domination over the natural world, and this dissenting view was not compatible with humanistic economic and legal systems. Similarly, mining companies have denied indigenous claims to sacred land on grounds of vagueness, arguing that there is no way to objectively describe a line between the ‘sacred’ and the ‘not sacred’. If society were to view all lands as sacred right-holding entities, our economic and legal systems would lose much of their meaning and applicability.

It is thus unlikely that large numbers of people will experiment with continuous dissent, especially if this suggests behaviours that are illegal or costly. However, successful resistance does not depend upon a large number of people. It is possible for a small group to materially halt the destruction of key places, disturb key infrastructure, or otherwise disrupt economic systems, in a manner guided by a shared ecological whole. These disruptions (in combination with natural disaster, climate disruption, refugee crises *etc.*) could then form a series of events that are symbolically interpreted into new stories that can shape the collective behaviour of the general population. After all, human societies are complex systems, and – as noted above – complex systems can respond to apparently tiny disturbances with qualitatively new behaviour. This disturbance and transformation should be the goal of ecocentric resistance.

It is tempting to assume that ecocentric resistance movements would have human leaders whose role is to interpret messages from the ecosystem for others, but such a model retains a humanistic bias that would become problematic – potentially leading to authoritarianism. Rather, leadership should be decentralized (or centred in holistic ecology), with most participants relying on continuous dissent to interpret direct instructions from shared ecological wholes.

Invalidating established stories to act in continuous dissent and protect the Earth may result in some confusion. However, this confusion should be small compared to the chaos produced by multi-national corporations destroying the Earth for profit. Continuous dissent does rely on the belief (supported by complex systems theory) that more-than-human ecological wholes can coordinate human behaviour. We should not expect this coordination to eliminate all confusion, but this strategy could promise some success relative to the imminent ecosystem collapse we otherwise face.

For the foreseeable future, the general population (not engaged in dissent) will remain humanistic, and so they will elect or claim particular humans as symbols of new stories that are being told. These human symbols will humanize the resistance and co-opt material successes to bolster humanist narratives. This negative feedback pulls economic and legal systems and the resistance back into established humanistic patterns. Nonetheless, human symbols could help reshape shared stories by translating the resistance into humanistic terms through reasoned language.

In any event, protectors guided by this strategy must expect to create (in combination with natural disasters *etc.*) sufficient disturbance to economic and legal systems such that these systems undergo qualitative change – change that will not be entirely foreseeable in its nature. Reshaping shared stories may enable humans to reorganize on the basis of partnership instead of dominator principles (Eisler, 1987). The histories and stories of indigenous peoples certainly suggest that healthier organizing principles for human society are possible (Kimmerer, 2013).

Cultivating continuous dissent

Given the future we face, it seems wise to attempt disturbance of anthropocentric economic and legal structures with the aim of reorganizing them around stories about animistic ecological partnership. Action that remains within the humanist paradigm is futile or damaging, and the cost of inaction will only be a deepening of the ecological crisis.

The dissenting view proposed here has some commonality with humanism. In both, individual experience is central for constructing meaning. However, a humanist perspective perceives subjective experience as potentially complete, while the dissenting view recognizes that individual experience is always only a fragment of larger patterns. By ignoring these larger patterns, the humanist view produces confusion.

Continuous dissent relies on subjective experience to construct meaning, because messages from an ecological whole cannot be rationally analyzed. The initial barrier to recognizing these messages appears surmountable, because many people already perceive messages in dreams, synchronicities, or other non-rational events; stories about direct communication from nature leading to activist resistance have made award-winning fiction (*e.g.* Powers, 2018). Once the message is recognized, subjective interpretation would be the only way to decipher its meaning.

Continuous dissent recognizes the limits of humanist cultural constructs and the harm these constructs can cause when they shape our language, cosmology, science and identity. We may avoid this harm by cultivating dissent through well-known methods for experiencing altered perception and transformation such as (but certainly not limited to): psychedelics (Sheldrake, 2020); meditation; derivation of basic needs in relationship to land (Feather, 2020); ritual (Somé, 1997); and direct action to protect and heal the Earth (Kimmerer, 2013).

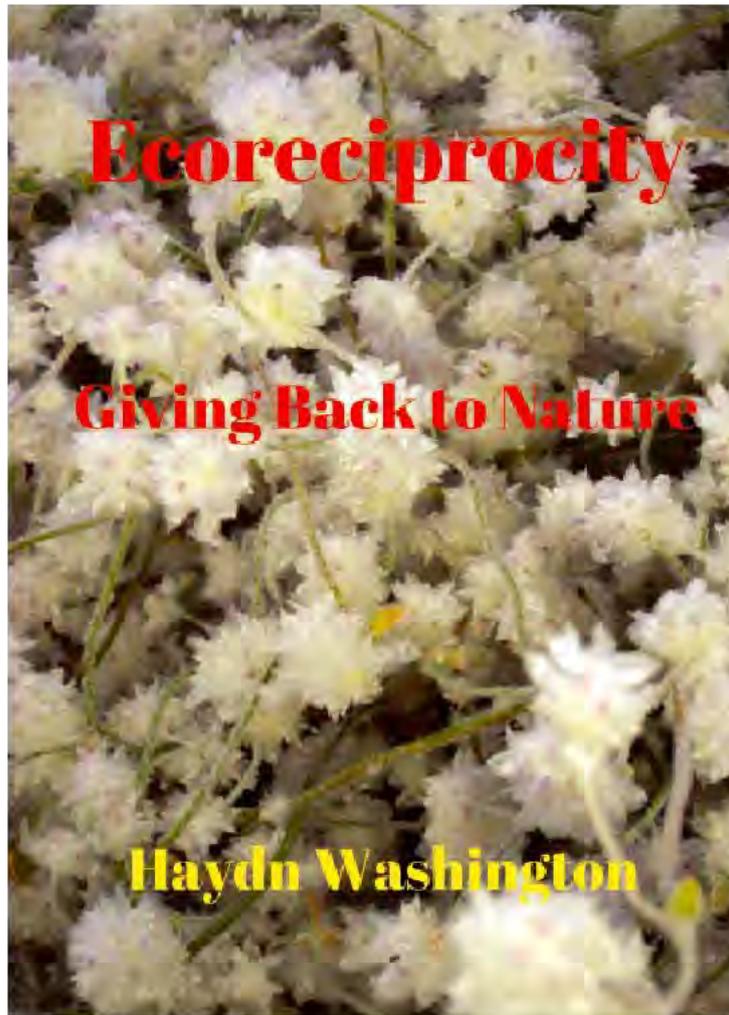
Notes

¹North American indigenous scientists (more likely to speak from animist rather than humanist cultural perspectives) have written extensively on the problems of humanism pervading these broad constructs (Wub-e-ke-niew, 1995; Cajete, 2000; Kimmerer, 2013).

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Nature has gifted us with so much. In environmental science we talk about ‘ecosystem services’ as the gifts nature provides us – fresh air, fresh water, fertile land and great beauty. It may seem surprising, but in Western society we hardly ever think about *giving back* to the nonhuman world. In contrast, many Indigenous societies find it perfectly natural that we should give back to Nature via gratitude, listening, and a duty of care. The book passionately argues that unless we cherish **ecoreciprocity**, we are unlikely to reach an ecologically sustainable future. The book opens with a Foreword by **Prof Mary Graham**, a First Nations Elder who is also an academic at the University of Queensland. The book examines what ecoreciprocity entails, Indigenous ecoreciprocity and what blocks ecoreciprocity - and how we can resurrect society’s ecoreciprocity. Published to keep price low at <https://www.lulu.com/en/gb/shop/haydn-washington/ecoreciprocity-giving-back-to-nature/paperback/product-8dop74.html?page=1&pageSize=4>

Poetry section

Edited by **Victor Postnikov**

Victor is a poet, essayist and translator based in Kiev, Ukraine.

Life far exceeds humans. For millennia, eco-poets have understood it as a far greater enterprise. In their poetry, we can hear the voices of those who came before us and those who live alongside us. Now, however, they face extinction and die in silence, deafened by the roar of civilization. The time has come to renew the old understanding that all life, including humanity, speaks a common language. Thus, the mission of ecocentric poetry, or ecopoetry, is to help us empathize with non-human entities, be they a whale, a tree or a mountain. For we are all kin. Through metaphor and imagery, it speaks directly to our hearts and genes. We begin to realize that we have evolved together and share a common fate.

CLASSIC

A haiku

Matzuo Bashō

*Tell me, for what reason,
O Raven, you fly to the noisy city
From here?*

CLASSIC

Good-bye

Ralph Waldo Emerson

*Good-bye, proud world! I'm going home:
Thou art not my friend, and I'm not thine.
Long through thy weary crowds I roam;
A river-ark on the ocean brine,
Long I've been tossed like the driven foam:
But now, proud world! I'm going home.*

*Good-bye to Flattery's fawning face;
To Grandeur with his wise grimace;
To upstart Wealth's averted eye;
To supple Office, low and high;
To crowded halls, to court and street;
To frozen hearts and hasting feet;
To those who go, and those who come;
Good-bye, proud world! I'm going home.*

*I am going to my own hearth-stone,
 Bosomed in yon green hills alone,—
 secret nook in a pleasant land,
 Whose groves the frolic fairies planned;
 Where arches green, the livelong day,
 Echo the blackbird's roundelay,
 And vulgar feet have never trod
 A spot that is sacred to thought and God.*

*O, when I am safe in my sylvan home,
 I tread on the pride of Greece and Rome;
 And when I am stretched beneath the pines,
 Where the evening star so holy shines,
 I laugh at the lore and the pride of man,
 At the sophist schools and the learned clan;
 For what are they all, in their high conceit,
 When man in the bush with God may meet?*

CLASSIC

To one who has been long in city pent

John Keats

*To one who has been long in city pent,
 Tis very sweet to look into the fair
 And open face of heaven,—to breathe a prayer
 Full in the smile of the blue firmament.
 Who is more happy, when, with heart's content,
 Fatigued he sinks into some pleasant lair
 Of wavy grass, and reads a debonair
 And gentle tale of love and languishment?
 Returning home at evening, with an ear
 Catching the notes of Philomel,—an eye
 Watching the sailing cloudlet's bright career,
 He mourns that day so soon has glided by:
 E'en like the passage of an angel's tear
 That falls through the clear ether silently.*

CLASSIC

Hell of a City

Vladimir Mayakovsky

*Helluva city windows burst split
 Into the tiny, light-sucking bits.
 Rusty demons, cars jerk and jeer,
 Their honks blast into the ear.*

*And there, under a sign "Herrings from Kerch" —
 A busted old chap for glasses searched*

*And wept when in the evening storm
Tram's pupils hurriedly perched.*

*And in skyscrapers' holes where the ore burned
And the iron trains heaped –
An airplane wailed and dipped
Where the wounded Sun's eye leaked.*

*And lastly – having folded lamp blankets –
Night's f...ked, obscene and drunk,
While somewhere behind the sunny shacks
Useless, flaccid Moon dragged.*

Translated by VI Postnikov.

Note: Kerch is a city in the Eastern Crimea.

CLASSIC

Excerpt from *The Book of Urizen* (Chapter IX)

William Blake

*Then the Inhabitants of those Cities
Felt their Nerves change into Marrow,
And hardening Bones began
In swift diseases and torments,
In throbbing and shootings and grindings,
Thro' all the coasts; till weaken'd
The Senses inward rush'd, shrinking
Beneath the dark Net of infections.*

CONTEMPORARY

Let the dark in

Abi Loughnane

*You have sailed the plastic tapestry sewn up the Mekong,
tasted the pesticides greasing the grass leaves,
do you see
from the cosmos, the Bortle scale,
clusters like melanoma igniting the city next door?
Halogen orange, fluorescent yellow,
blue, white, bright
light.*

Over here!

*Demand skyscrapers, polluting black air with
messages and marketing alight, moon
swimming bats lost hungry in San José,
breeding Khartoum croaks call unanswered,
hedgehogs in Putney bewildered by Toyota eyes brace,*

*five-inch turtle hatchlings crawl to the city, not the moon,
to a car and a crack.*

*We are always open!
Vows dome of amber
suffocating the city the system with
high-rise window and empty desk light, overlooking,
staring, wasting,
as four thousand stars evaporate.
Did you see the confused swallow thud into exhaustion?
Its bloodied, plump breast at your feet opal neck crooked?*

*Leave the kitchen lamp on!
In case you need a drink in the night,
keep the tree flashing as sleep arrives,
forget those milky fairies threaded through the hallway,
ignore the crisp moth shells in the bathroom ceiling,
blackout that infinite insect glow of end less porchlight,
Let's suppress your divine melatonin to the artificial Gods,
the synthetic.*

*Light in a
switch
bulb
button,
instant disposable,
cheap, with a
tock-tock-tock,
rhythms tampered,
as we overeat electricity, hindered
by the family with four children,
five televisions and curtains open, when we are already beyond
Help.
Light
igniting the writing above as we ignore the meteor,
dim the bulb or turn off the plug and
let the dark in.*

CONTEMPORARY

Mônadenok

David Crews

*Words like rocks
in Abenaki say, kisos*

*sun, moon, and month
together*

*kzelômsen, both
the wind
and how it blows*

*the night
a place of here
and thereness
pôguasek, moonlight*

*the many sounds
of water*

* * *

*I am no mapmaker
and this warbler song
I cannot place
to name
it has been a year
since I heard him sing*

*what care
can I give his solitude
little messenger
untranslatable*

*make me
silent as the page
aperture of light
for the bedrock
sees us, hears us*

*fills fissure
with earth, sheep laurel
microscopic life*

Note: Mônadenok – or, in Abenakis, “silver mountain” – is in New Hampshire, USA.

CONTEMPORARY

Connections

Christine Hallmann

*Encircled by protective giants filling the air with sweet pine and ancient ways of
knowing*

She sits in the warm grass

Watching the wildflowers sway in the breeze

*With closed eyes focusing on her other senses
She feels the warm midday sun on her face
Wind gently playing with her hair
Solidness of smooth gray rocks beneath her
Hearing the water move over, around, and through rocks as it flows beside her
Carrying with it all her troubles
Feeling that all is right; all is good
Calling her
Her mind moves back to the water
Do you remember
Do you remember who you are
Do you remember your relations
Do you remember
In a moment of primordial remembrance
A woven strand of blue-green energy connects her
She is connected to Earth
She is connected to self
She is connected to all her relations
Ultimate peace
Ultimate knowing
Ultimate dreaming
Ultimate ceremony
Her eyes open and she understands*

Note: The poem describes an experience Christine had while doing tree-ring fieldwork in Sequoia and Kings Canyon National Parks in 2000.

CONTEMPORARY

Unprecedented

Pete Mullineaux

*In the living fields –
three cow generations: calf
mother, grandmother.*

CONTEMPORARY

Summer Time

Pete Mullineaux

*When the living sometimes isn't so
straightforward as we take a retreating
step into darkness – delaying progress
before the coming again of light...*

*Then running the dial ahead to an hour
of reckoning, dire forecasts coming true –
ice gone, sea lapping at our throats, thinking
back, did we gain or lose that hour?*

CONTEMPORARY

Earthstars

Pete Mullineaux

Geastrum triplex

*Comets shooting from below, spores appearing
on Earth even before plants; closer to us than
to flowers – fungi breathe the same oxygen
and likewise suffer bacterial infections
although, even as they rot, microscopic
threads entangle, spreading
new life to their loam-home...*

*Stars of wonder, stars of darkness!
Spinners of an underworld-wide-web,
feeling our tread on their topsoil ceiling
moving like avatars on a screen –
how they must pity these poor relations
stumbling along, blinded by the light.*

CONTEMPORARY

We are the Walrus

Pete Mullineaux

*Harbinger or in search of safe harbour –
a young pup swept up on our shore,
straight out of a folk tale – enchanting
us with its whiskers and two-pronged
smile, all shimmering blubber – for a
while it took centre stage and like a
rock star drew the crowds.*

*Returned now to its proper home
where walruses loll in the surf
exchanging their own stories, one
about a human child that came
to play one day on the rocks,
making patterns with all the
discarded oyster shells.*

CONTEMPORARY

A Bullfinch

Pete Mullineaux

*is perched on the garden hose reel
pecking seeds from a dandelion –
I could watch all day – one, two, three o'clock...*

CONTEMPORARY

Lambs

Pete Mullineaux

*Jaunty jumpers
on their grass
trampoline*

*woolly clouds
in a green sky –
an upside down*

*picture-book image...
likewise, lets reverse
the usual adage –*

*judge this book
only by its cover
keep x ray eyes*

*and greedy fingers
from delving
around inside.*

CONTEMPORARY

In the Air

(From the Extinction Rebellion opening ceremony)

Grae J Wall

*Helicopter hovers over Hyde Park
747 cruises beneath the sharp half moon
As I saunter past the buzz and hum of Speakers Corner
Wrestling with the stiff breeze buzz
There's something in the air tonight*

*The throng at Marble Arch eager and set
Hang on every word relayed through the struggling PA
Prayers of hope and calls to peaceful disobedience
A small child takes the microphone
Something she has written today
Sweet and hopeful
Angry and alive
Crescendo triggering a roar of approval
Her face taken aback
But clearly proud
In the bonfire's glow
Some have brought candles in jars
LED's hang from flagpoles*

*And a few bold torches
Ablaze and thrust aloft
There is rebellion in the air tonight*

*This feels like a moment
Something real and pure and strong
A pin stuck in a slow revolving globe
A force to be breathed in and held
A song of hope that could awake the globe
There is a determination in the air tonight
This moment is the only moment
And it is a moment to believe*

CONTEMPORARY

In Exchange

Dee Allen

*I feel for the antediluvian forests
Being systemically cut for
American lumber building
Spreading more civilisation,
European biomass for burning
As factory-made fuel, new
Means to spoil the air—
Critters of the trees, of wings and paws,
Forced to fly and crawl to new lives
Of displacement—
Their original homes in exchange
For uncertainty— W: 7.9.21*

Note: This is a response to the poem *Immigrants* by Rupi Kaur.

About the poets

Matzuo Bashō (1644–1694) was a famous poet of the Edo period in Japan and the great master of haiku.

Ralph Waldo Emerson (1803–1882) was an American essayist, philosopher and poet who led the transcendentalist movement of the mid-19th century in America .

John Keats (1795–1821), an Englishman, was, together with Lord Byron and Percy Bysshe Shelley, one of the great Romantic poets.

Vladimir Mayakovsky (1893–1930) was a Russian and Soviet poet, a prominent figure in the Russian Futurist movement and probably the greatest innovator in Russian 20th century poetry and culture.

William Blake (1757–1827) was an English poet and painter, one of the forefathers of the Romantic Age and a prophetic genius.

Abi Loughnane resides in London, is currently studying writing with the London School of Journalism and is collating her first collection. She has been published in *The Honest Ulsterman*, *The Broken Spine*, *192 Magazine*, *Idler* and *StepAway Magazine*.

David Crews is a writer, editor and wilderness advocate who currently resides in southern Vermont – the ancestral lands of Mohican and Abenaki peoples. He serves as managing editor for *Wild Northeast*.

Christine Hallman is a professor of Geography and Sustainability Studies at Northeastern State University in Tahlequah, OK, USA.

Pete Mullineaux lives in Galway, Ireland, and works in development education. He has published four poetry collections.

Grae J Wall is a poet, musician and lomographer.

Dee Allen is an African-Italian performance poet based in Oakland, CA, USA. Active in creative writing and the spoken word since the early 1990s, Dee is the author of seven books and has 41 anthology appearances under his figurative belt so far.

Fiction section

Edited by **Joe Gray**

Joe is a field naturalist and conservationist who lives on the island of Great Britain. He writes eco-fiction under the pen name Dewey Dabbar.

Introducing a new section

As David Lodge wrote in *The Art of Fiction*: “I have always regarded fiction as an essentially rhetorical art – that is to say, the novelist or short story-writer persuades us to share a certain view of the world for the duration of the reading experience.”

More than anything else, it is this rhetorical potential that appeals to me as editor of what is a new section in *The Ecological Citizen*. For at a time of great uncertainty about the future conditions that life is going to face on Earth, even in the near term, and when readers of non-fiction are increasingly wearied by facts and growing warier by the day of misinformation, fiction offers a powerful alternative means of conveying messages of deep import, be they ones that will help shift mindsets or those that will directly inspire action. Drawing from personal experience, to give an example, I found Ed Abbey’s *Monkey Wrench Gang* to be powerful both in shaping the development of my own Earth ethic and in motivating me to go on to take direct action in defence of the Earth’s wild creatures and places.

What we are seeking to publish here, in particular, are stories which: first, are set on the Earth that we know, that we knew, or that we might some day experience; secondly, offer rich descriptions of places and characters, be they non-human or human; and, thirdly, have a plot (*i.e.*, some *this-affects-that* relationships between goings-on).

Within these bounds, we have a preference for stories in which the concerns of non-human actors are conveyed without imposing a human-like perception and understanding of the world on them. The genuine interests and conceivable psychology of these agents should be more than sufficient to merit the empathy of readers. And I would argue that anthropomorphism, at least in some cases, risks devaluing or belittling these. Anyone unconvinced of the potential for drama to arise from the lives of other-than-human beings should watch the scene from the spectacular and stunning nature film *Microcosmos* in which a scarab beetle rolls a ball of dung (this is available on YouTube but can be viewed within DuckDuckGo’s non-data-harvesting interface here: <https://tinyurl.com/ymr7y9na>).

Considering the mental capacity of non-humans in regard to the possibilities for fiction, EM Forster – in his *Aspects of the Novel* (an edited

transcript of a series of lectures given in 1927) – wrote: “[T]he actors in a story are usually human [...] Other animals have been introduced, but with limited success, for we know too little so far about their psychology. There may be, probably will be, an alteration here in the future [...] [U]ntil it comes, we may say that actors in a story are, or pretend to be, human beings.”

First, let me commend him, belatedly, on his use of the word ‘Other’ before ‘animals’, thus succinctly dissolving the human–nature dualism. And, secondly, let me excitedly reinforce the idea that scientific discoveries in non-human psychology can widen the bounds of fiction. Thirdly, however, let me humbly suggest that Forster was rather-too-dismissive of the merits of non-humans as loci of concern for readers of fiction. I imagine that people in 1927 knew, for instance, that dogs enjoyed affection and disliked mistreatment. And if you cannot make a story out of that, then I would question your credentials as a writer. (Relatedly, I suggest that Jack London’s short story *Bâtard*, from the first decade of the twentieth century, never made it onto Forster’s reading list.)

But I must, now, return to the main flow of this introduction. And here I will relate the most important point of all about the kind of fiction that we are seeking to publish. What we would like to receive, above all else, are pieces that in some way further the ecocentric worldview. This means that while stories which place humans as central characters are welcomed, if they consider ecological issues merely, or mostly, in terms of their implications for that one species, they are unlikely to be accepted. To put it another way, ignoring tragedy on a scale that dwarfs all others – that is, the awful plight, today, of innumerable non-human beings – renders a piece of fiction, I contend, mere escapism at best.

All that remains for me to do is introduce our first ever piece of fiction published in the journal: *Pigs*, by Tamsin Pearson. I found this story to ooze sensitivity and honesty, to inspire empathy for non-humans, and to offer some humorous observations, while being rich in those little details that really set you thinking. In short, it is my favourite kind of fiction.

Joe Gray

For further information on submitting fiction please visit:

<https://www.ecologicalcitizen.net/submitting-fiction.html>

Pigs

Tamsin Pearson

My daughter acquired a piglet. On her way home from school, there was a commotion: a livestock transporter had taken a wrong turn and jackknifed around the mini roundabout at the bottom of our hill. What with the precarious leaning and an altercation with a lamppost, one of the trailer doors had swung open and some disoriented captives had spilled out.

Piglets make an attention-grabbing noise at the best of times; one in particular was stumbling in a circle and squealing its distress most querulously. Molly couldn't resist trying to comfort the poor creature. Assessing the scene, she decided that the lorry was destined for the abattoir. Fired with a passion of injustice, she took the executive decision to liberate the piglet by stuffing it up her jumper.

I peered around the back kitchen door, wondering about the source of the splashing and squeaking. Molly stared back with the frozen terror of anticipated parental disapprobation. Actually, I had only two injunctions: firstly, she should not move it from one place of captivity to another—it was not going to live in a cage—and, secondly, unfortunately, she could not release it into the wild, because it was not wild. Here Molly pointed out that 'it' was actually 'she', because of the neat array of studs across her belly.

Not knowing what stage of weaning the piglet was at, we could only offer water, which seemed welcome, and an old towel for comfort. Whatever had happened to her, she must have been traumatised, having been separated from whomever and whatever she had been familiar with. The distressed squealing only subsided while Molly was with her; thus we found ourselves at that impasse.

I called the farmer whose land abuts ours. Angus has a gait you can recognise literally a kilometre away. Heather moor and machair is not conducive to striding; consequently, he has achieved this efficient pumping effort, so that he appears like a tweed-upholstered steam engine: pistons at the bottom, whistle at the top.

Promptly, Angus scissored over the back fence, bearing a huge sack and dragging an empty plastic bin. Apparently this feed would cover the basics, and could be supplemented with a wide range of kitchen scraps.

Meanwhile, Molly had named her new companion Penelope. Recognising that sharing her bedroom would not be an option, she presented me with an irrefutable plan: she would put her brother's sleeping bag in the back kitchen. Thus the pair of them would magically and hygienically bond.

While we consulted Angus about a longer-term solution, Bill, our community police officer, rang the doorbell. He was trying so hard to stifle a smirk that he appeared, quite misleadingly, to be winking at me. He exhaustively explained about the navigational incident, the wandering livestock, the chagrined driver, the irate farmer, the tangled traffic, and so on. Had I seen any unattended farm animals? He seemed to be concerned less about welfare and more about the repercussions of transport stupidity.

I stifled my own smirk and carefully responded: notwithstanding my personal philosophy that one creature cannot be owned by another, I had not seen any domesticated animals, 'owned' by any local livestock farmers, wandering about unattended. There was no comedically-timed oinking off-stage. Bill issued the standard advice: not to approach any such individuals, which might be dangerous; then hirpled back down the hill, still smirking.

Back at the kitchen conference, Angus was struck by inspiration: a landowner over toward the Cairngorms had recently established a herd, a drove, or possibly a parcel of pigs – there are as many collective nouns for pigs as humans have found uses for them. They were to perform land management

functions, such as thinning out scrub and saplings from wooded areas, and churning the boggy soil to increase the diversity of wildflowers.

We met this landowner, Trish, and approved her livestock-conservation experiment, and her native plant monomania, and even her meringue hairdo. Happily, Penelope would be welcomed as a herd member. The herd was immaculate; in contrast, Jim, the herder, appeared to have been dragged through a hedge sideways, and to have brought most of it with him as evidence.

Several visits ensued to acclimatise Penelope and gradually leave her with her new family for longer periods. For a few weeks Penelope settled in fine. Molly visited her on Saturdays by charming Angus into giving her a lift on a series of pretexts. We were all happy that Penelope was squealing less and gaining weight.

On the fourth weekend, my son, Nicky, and I went along too. When we arrived, Jim was loping into view – as always, authentically adorned with twigs, but today missing his grin. Molly was excited to greet Penelope on her return from foraging. However, Penelope was missing. Jim tried to cover his concern with an unwavering adherence to procedure: settle the rest of the herd safely in their quarters, then head back out to search.

We heard Penelope from some distance. With Molly echoing, the cacophony reached a crescendo. Jim and Nicky triangulated Penelope's squeals to a drainage gully surrounded by a few ancient pines. She was in the base of the gully, among long grass, beside a pile of scrub trimmings, trembling. The gully wasn't especially deep or enclosed, and Penelope appeared uninjured, so we were baffled why she hadn't rejoined the herd.

Molly rushed to comfort Penelope, but being lifted and petted made her even noisier. Any attempt to remove her produced unbearable squeals. Jim and I wandered around searching for any indication of the cause. I didn't know what I was looking for. Nicky ranged through the scrub, compulsively clicking his camera, and somehow the lens saw what we didn't: hiding, cowering under those scrub trimmings, was a smaller piglet with a darker complexion.

Molly glowered an accusation that Jim hadn't counted carefully enough. He tactfully, and with relief, pointed out that this piglet was not one of the herd.

Leaving Nicky circling Molly and the two piglets in a kind of camera corral, Jim and I searched further. We were so thankful that Molly wasn't with us when we discovered the carnage: at the side of a small clearing lay a sow with mutilated head and limbs. Several similarly eviscerated piglets were strewn nearby. I was overcome with nausea and had to walk away. Jim had a stronger constitution and could make a detailed visual assessment.

Jim told me that this massacre was not wild animals: no fox or wildcat would do such damage and leave the meat. Realising what he meant brought me another wave of nausea. The only animals that torture other animals for amusement are human.

Despite the glaring wrongness of the situation, we weren't equipped to assess what 'crime' might have been committed. We would need specialist advice about examining and recovering the bodies. I collected Molly and the two piglets; they seemed less distressed so long as they were together. Jim quietly asked Nicky if he felt able to graphically chronicle the site.

In the dazzle of shock, I found myself standing inside the pig pen, staring out across the moor. The fence wood felt less comforting than I needed; it hadn't been enough protection. Molly had taken the two piglets somewhere dark and cosy to soothe them. My mind homed in on one incongruity: how did a pregnant or nursing sow end up way out there?

Jim reappeared looking haggard. He'd contacted nearby farms and carefully enquired if they were missing a piglet. He'd made a joke of it, as if it were more likely—as Molly had silently accused him—that he'd simply miscounted. No takers. Farmers value livestock, even if only financially, and they tag them. That Jim hadn't mentioned multiple piglets or the sow confirmed my fears: he wasn't ready to announce that ghastly discovery yet.

Livestock owners don't misplace sows. I thought of the livestock transporter, but Jim considered it unlikely that any pig would walk thirty miles. Still, I called Bill with a similar careful enquiry about a found piglet. He had no claim either; the contents of the transporter had been accounted for or written-off. We were not wanted for pig rustling. Apparently whoever 'owned' these terribly unfortunate creatures didn't care. And the perpetrators of their treatment... Jim and I stared at each other, bewildered by the horror, trying to penetrate a mindset that was entirely alien to us.

Jim had also contacted Helen, a specialist vet at the University. As soon as she arrived, he took her over to the discovery site. The three of us made to go home. I expected Molly to make undeniable demands for Penelope and Peter, the new orphan, to come with us. However, without having seen the full horror, she seemed to accept that they were in the least worst place.

The following day we lugged kilos of windfall apples from the garden, as if food could somehow nullify the trauma. We were horribly nervous, trying not to anthropomorphise, yet still hearing the echoes of Penelope's cries. Penelope and Peter had settled in together, inseparably. They both remained clearly different from the rest of the herd, but, at least, not isolated.

Reports were made, officials notified, investigations launched. Jim gave me sight of Helen's analysis: it was impressively technical. I didn't know science was so advanced in this area, but then I wouldn't. Technically, we can track the buying and selling of pigs. Theoretically, incisions in flesh can be matched to a specific individual animal. Perhaps the perpetrators were not local, but moving a pig is not easy – ask that livestock transporter driver. Most of all, Helen had a straightforward conclusion: many of the incision marks on the pig flesh were caused by dogs, most likely terriers.

Newspapers picked up the story; Jim was interviewed by local radio; and there were the polarised perils of social media. Some thought piglets were adorable and wanted to keep them in handbags; some wanted to make them into handbags; some raged defiance at a perceived threat to their bacon butties; some condemned the mutilators to suffer a similar fate. I was labelled 'pig-woman', apparently an overlooked mythological chimera. Some felt I was interfering in a traditional way of life, persecuting the benevolent custodians of the land. After all, pigs are not people.

Right on cue, local game-shooting estates spluttered their umbrage at implications, bleating that they mostly used spaniels or Labradors – apparently the classier hunters’ choice of dog. Their shrill defensiveness, rather than sharing our horror at the atrocity, said a lot. The only animals that torture other animals for amusement are humans. And some of them train dogs to assist.

While the wheels of human justice ground, Molly and I visited the pigs. Across the moor, we exchanged waves with Trish, still identifiable through the drizzle by her phosphorescent meringue. She was marshalling a convocation of botanical experts bristling with arcane instruments and waterproof clipboards.

As Molly played hide and seek with Peter, Penelope considered me carefully. Distantly I heard Molly giggling, “Where are you hiding? Where did you come from?” I gazed back at Penelope. Where *did* she come from? I called Helen with some hypoxic notion about analysing teeth isotopes to establish geographical origin. She reckoned she could go one better.

When the case finally reached court, I took the first half, squeezing into the public gallery; I was keen to hear the evidence, the reasoning, the diversity of expertise brought to bear.

The transporter’s inmates had originated at a smallholding, whose livestock had failed to achieve an adequate ‘feed conversion rate’; the business had thus gone bankrupt and had been required to ‘liquidate’ its assets. An aspiring gamekeeper, with the appearance of flies buzzing around his head, had tried to expedite his entry credentials by taking advantage of that convenient ruin, and of one animal in too poor a condition for the abattoir – even those institutions of death draw a line. A vet from a nearby town had reported an unusual bacterial infection in a terrier, most likely from eating raw meat. Although not near a road, the pigs’ carcasses were reasonably near an access track on a neighbouring shooting estate.

Plausible, compelling, but not sufficient for legal redress. Nor would the conviction of one thrown character be restitution. Then Helen used genetic markers to show that Penelope and Peter were siblings. After that, I couldn’t see anything for tears.

Jim took the finale; he was keen for the result. I’m happier out here, getting muddy with the pig people; letting them be wild boar again.

As it turns out, the whole court business has been dwarfed by a second discovery: the hooves and snouts of Penelope and colleagues have unearthed and favoured some plant of international significance, with medicinal implications. Trish’s hair is shimmering with excitement: this plant—named something like ‘pig myrtle’—was previously thought extinct. Consequently, the entire area, especially, felicitously, including a portion of the adjoining estate, receives an immediate protective cordon. Activities are strictly curtailed.

Penelope expresses my feelings best: she quivers in a sort of porcine frisson, then trots away in search of further botanical delights.

About the author

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“Halvor had been one of the first cities twenty-five years ago to grasp the nettle of over-population and make contraceptive implants compulsory for all men from puberty onwards. Exemptions were rigorously defined and arbitrated: homosexual men in committed relationship, avowed celibates, and any grouping who had made either a civil or a sacramental commitment to the work of bringing up a child, who had completed a four-year parenting course and were supported by the requisite number of co-parents. For the first controversial years Halvor had quarantined itself and made contraception a condition of entry for women and men. Then women across Thalassa, hearing the sighs of relief and pleasure from Halvor, began to demand the same rights. Economists and researchers came in droves to study a city that was accounted thriving in every way. Con.implants renewable annually, were now all but universal. Their failure rate was minimal. First-trimester abortion was freely available to any woman who found herself unwillingly pregnant. Con.skivers were treated with social scorn and judicial severity...”

Annie March, from: As A March Hare: Dances of Personal and Cultural Transformation (North Hobart: Walleah Press, 2011: 137)

