Imagining transformative biodiversity futures

Biodiversity research is replete with scientific studies depicting future trajectories of decline that have failed to mobilize transformative change. Imagination and creativity can foster new ways to address longstanding problems to create better futures for people and the planet.

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The world has changed. Posited to be a 'super year' for biodiversity with various international meetings and the conclusion of the Convention on Biological Diversity's ten-year Aichi Targets, 2020 will be remembered for very different reasons: catastrophic fires, the COVID-19 pandemic, floods, locust outbreaks, a drastic drop in oil prices and widespread food insecurity. These disruptions will exacerbate the already considerable gap between rich and poor, hitting marginalized groups — the impoverished, women, Indigenous communities and people of colour — much harder. Impacts on the environment have been mixed: carbon emissions may be down, but there are growing concerns that nature will be forgotten in the rush to rebuild devastated economies.

Times of rapid disruption create novel opportunities for change. When longstanding ways of doing things are destabilized, new ideas, institutions and ways of relating to one another can take hold. These events remind us that the future is uncertain and that big changes are possible over short timeframes. To capitalize on this moment, the biodiversity community needs to be creative, to imagine new futures that enable people and nature to thrive on our planet. Now is a time to revolutionize how we listen, think and act.

The biodiversity community — those researchers, citizens, local knowledge holders, practitioners and decision makers concerned with the natural world and its relationship with people — are scrambling to use this opportunity to create thriving futures for people and nature. As fodder for the conversations, strategies, research plans and decisions that are unfolding, we offer three possible futures that characterize ongoing debates within the biodiversity community.

Set in 2050, they chart the consequences of decisions or events that may unfold over the next few years. Each future is situated within a rapidly changing Anthropocene. None of them are inevitable. Many more exist: zero conflict, obliterated nature, societal collapse. We have crafted stories that highlight contrasting world views that shape who has power, what values are prioritized and which bits of biodiversity 'matter'. You will probably like some aspects of each future and dislike other aspects at the same time. We invite you to let your imagination take you to the year 2050.

Basic needs

Enjoying coffee and locally sourced breakfast cooked in a communal kitchen, you watch the news streamed through a vid-cast. Luckily, your rations arrived yesterday, so you have fresh coffee for the first time in weeks.

After widespread popular revolts in 2021, equality and social welfare are now prioritized by national governments. Many countries turned inwards, focusing on producing food for their citizens. With less consumption, trade and travel, carbon emissions flat-lined. But this morning's news is evidence that this may have been too little too late: cyclones in the Philippines, catastrophic fires in California in winter and water shortages across the Andes. You wonder what could have been possible if there was more money available for research and innovation.

Not all nature is thriving. Healthy mangroves protect urbanized coasts from rising sea levels, urban food forests are buzzing with visitors and nature-friendly farming provides food for local markets. However, efforts to protect wildlife are fading as funding has dried up. Iconic species like orangutans and giant pandas are probably extinct. But, basic needs are being met and society seems to be adjusting to life within limits.

Wildlife rules

You wake up and open a bag of lab-engineered coffee and rip open a box of fortified breakfast cereal from climate-controlled farms. The local desalination plant ensures a constant supply of food despite ongoing droughts in your region.

At the annual Global Conservation Summit, a virtual reality tour brings you and your colleagues thousands of miles away to the Congolese rainforest. You see gorillas protected by digital fencing and military drones. The project exemplifies the extreme conservation measures adopted globally in 2021 as the world struggled to limit the spread of zoonotic diseases. Though impressed, you wonder where the people live and how they make their living.

As priorities shifted from climate action, emissions growth continued. This means that while militarized conservation protects

species locally, climate-sensitive species are now only found in climate-controlled enclosures in zoos. The Arctic is ice-free in the summer and the polar bears are gone. More people are employed protecting species rather than hunting and harvesting them for food and trade, but society as a whole is disconnected from nature.

Climate first

You munch your breakfast of locally farmed oats and an apple from your roof garden. As you down your carbon-neutral coffee, it is met with a shot of nostalgia for a good cup of Venezuelan coffee.

Your Unity BCI (Brain Computer Implant) projects drone footage from the Radical Climate Action Alliance: deserts covered with solar farms; oceans with wind farms; and farmed land covered with biofuel crops. The Alliance successfully advocated for environmental and human rights treaties to be revoked in 2021 in favour of a Climate First Charter that prioritizes storing carbon and generating clean energy. You feel a sense of pride at a nuclear reactor displaying your national flag and consider how corporations have benefited from green energy partnerships while inequality has risen.

The clip closes with images of carbon-capturing trees in the Amazon. You would love to visit one day, but carbon sanctuaries are closed to visitors: not even Indigenous peoples who have sustained these landscapes for thousands of years can enjoy them. Widespread restrictions on travel have devastated local economies, and with no ecotourism, funding for conservation is scarce. The Great Barrier Reef has recovered but wind farms have decimated avian species and bats.

Whose future?

These worlds are allegories that capture major features of a two-year dialogue — under the banner Biodiversity Revisited — involving almost 300 experts from across the world, at different stages of their career and with diversity of backgrounds. The initiative has generated a transdisciplinary agenda that calls for research to mobilize plural knowledges, ethics and actions to sustain diverse and just futures for life on Earth[1,2]. These stories take place in the future, but the values and motivations that underpin them exist in the present[3]. We have imagined how they may play out to stimulate more creative ways of considering the trade-offs and consequences of current choices, decisions and actions.

In 'Basic needs', decision makers focus on addressing social inequalities through radical economic interventions[4]. Here, society values local biodiversity that sustains human well-being. 'Wildlife rules' describes a world where governments and conservation organizations focus on preserving iconic species and large landscapes, at the cost of displacing local communities and other potential trade-offs[5]. In 'Climate first', governments around the world addressed climate change through technological solutions; biodiversity is valued only where it serves climate-change mitigation[6]. Each story implies different ways of producing food, because this is an important signifier of society's relationship with nature and how biodiversity is valued[7].

As vignettes, the stories are unavoidably incomplete. Who does the imagining matters for which story is told, for what stories are enacted. The stories illustrate that biodiversity, climate and inequality are inseparable agendas. We are not suggesting a choice between worlds, but rather, a choice between ways to navigate diverse pathways.

The biodiversity community needs to move beyond the technocratic approaches that currently dominate ways of thinking about the future[8]. These approaches are often built on outdated assumptions that often do not reflect diverse knowledges and perspectives about biodiversity values[9]. This matters because projections of the future both represent and create trajectories of change by shaping how problems are understood and communicated, and therefore which strategies are developed to address them[10,11]. This means that researchers have to acknowledge that imagining the future, whether in a model or a story, is political[12].

Imagination in the Anthropocene

Imagination is critical to sustainable and just futures for life on Earth[8,13]. Writing after the West African Ebola outbreak, Professor Michael Osterholm and colleagues called for more "creative imagination" to consider future pandemic scenarios[14]. This feels particularly salient five years on. Purely technocratic approaches fail to engage with the emotions that motivate action towards alternative futures: fear, hope, grief and agency[8,15]. By building new ways of thinking about longstanding problems, inclusive and creative processes can generate positive stories about the future in ways that are empowering[8,10]. Imagining the future can drive societies towards change by shaping common practices, aspirations and institutions[16].

Methods for imagining, such as scenarios analysis, strategic foresight and speculative fiction are commonplace in research, investment and planning[8,13,17]. They can help the biodiversity community address the bleak futures that are projected for biodiversity. Research can play an important role in embracing imagination by fostering novel participatory methods that enable society to explore what is possible, plausible and desirable[13]. All models and scenarios are wrong, some are helpful: they contain assumptions about what matters, what is known and what is unknown. Embracing and communicating these assumptions and uncertainties builds trust in science, opening up spaces for deliberation about values, trade-offs and desirable futures[18].

Imagination can build the anticipatory capacity to get ahead of the curve, rather than react to crisis[17]. Decision makers must learn to provide anticipatory leadership that fosters shared responsibility for actions that may have greater costs now, to avert harm in the future. Enabling transformations also requires those who benefit from the status quo to acknowledge the need for change. Policy frameworks need to consider the distribution of costs and benefits over longer timescales when setting current priorities. Ultimately, society needs to accept that the future is unknowable and uncertain, but that action is needed now.

These anticipatory capacities start with asking: what are the short- and long-term drivers of change? What values should be maintained into the future? What can be done differently over the next five years? Over the next 30 years? What do we need to know and what will we never know? How can options be created and traps avoided? What are the ethical implications of action and inaction? Considering these types of questions can provide a foundation for decision making despite uncertainty.

Our stories show that choices have consequences. Some close down options. Some open up multiple pathways. Either way, choices create winners and losers. The critical challenges of the Anthropocene require humility[19] and the ability to respond[20]. Imagination can help the biodiversity community grapple with these challenges by embracing diverse ways of thinking, listening, being and knowing. And such diversity can be the foundation of more just and sustainable futures for life on Earth. ❐

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