
Opinion

The Need for Education about Threats to Biodiversity and Loss of Ecosystem Function in the Corporate Sector

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Over half the world's economic output depends on natural assets and future healthy ecosystems will be essential for our continued survival. While both public and private sector corporations have been active in finally addressing the threats posed by climate change, there has been little focus on the wider implications of a decline in the world's natural capital. Company boards have an important responsibility to play in addressing this challenge. Some possible solutions are presented, and the role of biology educators will be especially important.

Key words: *Biodiversity, boards, corporate sector, education, natural capital*

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INTRODUCTION

More than half of the world's economic output, estimated at US\$ 44 trillion, is dependent on nature and its services (World Economic Forum, 2020). However, investors, lenders and corporations in general have been slow to recognize the threats and opportunities of natural capital – the natural assets that provide natural resources inputs and environmental services for economic production (United Nations *et al.*, 2005).

The corporate sector, especially large industries and commercial enterprises, have in the past been focused on delivering profit and other short-term objectives to their owners and shareholders. Recently, responding to shareholder activism, public concerns, stakeholder pressure and government regulations, they have increased efforts to decarbonize their operations and quantify their role in combating climate change. Corporations are also responding to en-

vironmental, social and governance (ESG) risks, including such things as reducing their dependence on fossil fuels, ensuring their supply chains are free from slavery and child labour and ensuring proper process is followed in human resources management in terms of harassment, equal opportunity and anti-discrimination. Superannuation funds in Australia have been investing in ethical operations and using their influence to drive ESG (Kitney, 2022). Corporations are now aware of the fragility of the 'social licence' to operate; social licence is now much more than just complying with environmental regulations.

Given their dependency on natural capital, corporations should assess their nature footprint to focus on more than just climate change but consider wider implications of environmental change, especially loss of biodiversity and loss of ecosystem integrity.

WHY CONSERVE BIODIVERSITY?

Biodiversity is the total of all living things in an area. It not only includes the range of all forms of life such as bacteria, protista, fungi, plants and animals, but also their genes.

Biodiversity must be maintained. While some argue biodiversity must be kept for ethical reasons (it is wrong for us to exterminate other life forms) or aesthetic reasons (we should not destroy the beauty of nature), there are more important pragmatic reasons that directly affect our own future survival and well-being. These are based on the concept of *ecosystem services*. The European Commission (undated – see Website list) describe these services thus:

“Healthy ecosystems clean our water, purify our air, maintain our soil, regulate the climate, recycle nutrients and provide us with food. They provide raw materials and resources for medicines and other purposes. They are at the foundation of all civilization and sustain our economies. It’s that simple: we could not live without these ecosystem services.”

These beneficial ecosystem services can be classified into four categories: provisioning services (such as food, water, fuels, medicines), regulating services (purifying air and water), flood and disease control, cultural services (spiritual wellbeing, recreational needs) and supporting services (such as pollination, primary production, nutrient cycling) (Chivian and Bernstein, 2010; Department of the Environment, Water, Heritage and the Arts, 2009).

There has been incontrovertible evidence that the world’s climate is undergoing major change, and this can impact on biodiversity. For example, recent floods and bushfires in Australia have been the most widespread and destructive in recorded history. One of these impacts has been loss of biodiversity across large areas

and the resultant loss of ecosystem function. The bushfires in the Australian State of Victoria in 2019-2020 are a case in point. They covered an area of 1,511,000 ha, affected 79% of known habitat of an endangered marsupial, the Long-footed Potoroo (*Potorous longipes*) and 43% of the critically endangered Brush-tailed Rock-wallaby (*Petrogale penicillata*) with fewer than 30 animals living in the wild before the fires (Department of Environment, Land, Water and Planning, Melbourne, Victoria: DELWP, 2020). The situation for frogs and fish in Victoria is even more dire with around 90% of habitat loss affecting some species. The intensity of the fires left vast tracts of land denuded of living vegetation and subsequently caused large scale erosion and siltation of rivers (DELWP, 2020). Across Australia, these fires killed 420 people. A heat-wave in Australia in 2018 killed 23,000 of the Spectacled Flying-fox (*Pteropus conspicillatus*), an important pollinator, driving its conservation status to endangered (Gittens, 2022). Australia has also experienced three years of La Niña weather conditions (2020-22), resulting in massive floods – the worst in over 100 years in Victoria.

Climate change is but one of the six major causes for the decline in biodiversity and threats to nature in Australia. Others are habitat change, fire, invasive species, unsustainable resource use and aquatic ecosystem changes caused by changed water flows (Department of Sustainability, Environment, Water, Population and Communities, 2010).

CORPORATE GOVERNANCE

The corporate sector has a major role to play in conserving biodiversity especially since their sustainability depends on healthy ecosystems.

Many corporations, in both the private and public sectors, are governed by a board of directors that represent the interests of their shareholders, members or government. Directors oversee management to ensure compliance, risk and financial sustainability and growth. They develop the strategy including vision, mission and other high level strategic statements such as risk appetite. Most importantly, they appoint and monitor the performance of the Chief Executive Officer (CEO).

In the past the corporate sector concerns have mainly been with profit. Boards have typically been made up of industry experts (especially former CEOs), accountants and lawyers. While all members were meant to have basic financial literacy, the specialists enabled deep dives into financial and economic matters that supported boards' audit and risk committees.

More recent challenges have led to repeated calls for boards to include expertise in information technology (IT) and cybersecurity (AICD, 2022 – see Website list; Conrad, 2022; LeBlanc, 2022 - see Website list). The recent 2022 breach of security at Australia's Medicare Private health insurance led to ransomware extortionists accessing and releasing personal health records of 9.7 million Australians, reinforcing the call for boards to have more skills and expertise in IT.

Others have urged boards become more educated in science, technology, engineering and mathematics (STEM), including appointing scientists as directors (AICD, 2020 – see Website list). The Australian Chief Scientist Annette Foley has challenged companies and their boards to consider how science and technology can affect their organisations and how to better use scientific research (Courtney, 2022).

Similarly, corporations and businesses of all sizes need to address the impact they may be having on the destruction of natural capital. This impact is an important board responsibility. While shareholder activism, political, customer and community pressure has seen a marked increase in boards addressing their responsibilities to climate change and decarbonization (for example, Efrat, 2022; Niesche, 2022a), there is an equally urgent need for boards to address their organizations' responsibilities towards biodiversity and natural capital decline and restoration of impacted ecosystems. Biodiversity loss and ecosystem collapse are in the top five emerging global risks listed by the World Economic Forum (World Economic Forum, 2020).

If companies' activities deleteriously affect biodiversity and ecosystem health, profitability can be diminished as, for example, resources for human needs become unavailable. Reputational damage can lead to loss of business. Nature thus really matters to boards, investors and business in general (Shrivastava, 1995; World Economic Forum, 2020; Leeshaa, 2022; Summerhays and Waterford, 2022).

THE WAY FORWARD

Corporate boards therefore have a responsibility to reduce their organizations' impact on nature's capital. How best to achieve this?

1. Board membership. While it will be important for all directors to become "nature literate", having an ecologist with specialist insights into ecosystem function and biodiversity is a simple way to ensure nature capital is addressed by a board. The ecologist could help undertake "deep dives" into aspects of the business' impacts on the environment and help guide appropriate reporting and interpretation of these reports. Some boards already

- mandate that at least one member has such specialist skills – for example, at least one director on the board of Parks Victoria, an Australian state government authority, must have conservation expertise and qualifications.
2. Board policies. A spectrum of board initiatives in ESG exist. At one end, boards may simply have a steering or working group that addresses sustainability issues. At the other end, a formal board committee dedicated to ESG exists, there are formal sustainability mandates, accounting systems that take into account natural capital and a formal board-led sustainability strategy (Hendy, 2022). A sustainability strategy might not just consider net zero carbon emissions, but net positive nature goals, where biodiversity is enhanced and augmented through conservation and restoration by the corporation's activities.
 3. Key management appointments. 14% of companies in the Asia-Pacific region now have a Chief Sustainability Officer who plays a vital role in embedding ESG to join other “C-suite” leaders in finance, IT, risk and so on. Hendy (2022) notes these appointments traditionally have been focusing on the organisation's decarbonization and energy, but they will be expected to address nature in the future.
 4. Professional development opportunities for directors. This could involve seminars, workshops, lectures, courses and other educational experiences to upskill existing board members in the field of biodiversity, ecosystem services, natural capital, environmental accounting and nature-positive strategies. Biology educators have a role to play in designing and delivering fit-for-purpose curricula. They also need to work with accountants and economists so that natural assets are valued, and environmental accounts are included in corporate reports.
 5. Educators also have an important role to play in educating the wider community on ecology to prevent the misuse and misinterpretation of terms and concepts such as *ecosystem*, *DNA*, *ecological resilience* and *biodiversity*. Phrases such as “the business ecosystem” and “maximizing returns for investors is in our DNA” are confusing and bring into question the user's expertise in their own specialization. Biology educators can also help identify “greenwashing” where companies give an impression of acting in an environmentally aware and sustainable fashion but are merely ticking the boxes for marketing and reputation purposes (Tarrant, 2022 – see Website list).
 6. Biology educators also have a role to play in working with scientists and government to properly regulate biodiversity conservation. A review of Australia's environmental laws has revealed they are not addressing the rapid decline in natural capital. In response, the Australian government has promised to introduce wholesale reform of the environmental legislation (Niesche, 2022b).
 7. Global initiatives. The Taskforce on Nature-related Financial Disclosures (TNFD, 2022 – see Website list) has been set up to help the drive for nature being built into financial and business decisions. The TNFD closely follows the earlier development of the Taskforce on Climate-related Financial Disclosures; both movements align with the requirements of the International Sustainability Standards Board. Importantly, the TNFD is science-based and government supported across the world. It aims “to develop and deliver a practical and globally consistent risk management and disclosure framework that enables corpo-

rates and financial institutions to assess, manage and report on their dependencies and impacts on nature” (Leesha, 2022, p. 30). The Australian Government’s Department with responsibilities for environment helps fund the TNFD and will be facilitating workshops with peak Australian bodies in business, industry, investors and shareholders. The final framework should be introduced in September 2023 and will include feedback from these and other consultations.

CONCLUSION

There is an urgent need for the corporate sector to consider the impacts their activities have on the world’s natural capital and how global declines in biodiversity and ecosystem services will affect their operations, continued profitability and society. There is a groundswell of activity to address the decline in health and functioning of ecosystems, but all levels of business, the community and government need to respond quickly. Biology educators can play a significant role in helping formulate such a response.

As the IUCN has stated, “Nature’s Future is Our Future” (IUCN, 2021 – see Website list).

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