

A response to “Thoughts on aligning ethics with a new concept of ecosystems and ecosystem management” by Oswald J. Schmitz

Brendan Mackey, Fenner School of Environment and Society, The Australian National University (email: brendan.mackey@anu.edu.au)

Os Schmitz calls for a land ethic that recognizes the ecological and evolutionary processes that sustain ecosystems and provide the functionality needed for life to flourish. This system-level functionality includes self-organization, self-regeneration, resilience and adaptive capacity. He wisely notes that as ecosystems are embedded within an unfolding universe and a dynamic Earth system, maintenance of micro-evolution and ecological interactions are crucial if life is to persist in the face of changing environmental contingencies and external pressures. Such a bio-sensitive¹ ethic demands we recognize additional values to those associated with species and their habitats. This further suggests that the kind of ecosystem management called for is of a subtler kind involving what Willis Jenkins in his response calls abstemious; which I interpret as management which reflects deep understanding of natural processes, and comprises interventions which are modest in their “handprint” rather than involving heavy-handed manipulation of natural elements and processes.

To date, human-ecosystem interactions have resulted in widespread destruction and degradation of landscape ecosystems. About half the world’s forests have been lost and about 20% of land is subject to intensive agriculture². At one level such change is inevitable given that the land is where people live, work and play. A certain percentage of the land surface must inevitably be transformed to provide 6-10 billion people with even the basics of a decent life. However, the human footprint gets heavier with each decade as more ecosystems become used mainly as either a source of input to industrial production or as a waste dump for its waste.

The industrialization of ecosystems is evident in forestry, livestock production, agriculture, water use, and ocean fisheries. Industrialization leaves little room for biological diversity and the adaptive capacities it supports³. Industrialization depletes ecosystem stocks of carbon, water, nutrients and high quality energy, in order to maximize short-term production of one

¹ See *Biosensitive Futures* by Stephen Boyden; www.biosensitivefutures.org.au/

² *Global Resources Assessment 2010*. FAO; www.fao.org/forestry/fra/fra2010/en/

³ *Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems* by I.Thompson, B. Mackey, S. McNulty and A. Mosseler A. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43, 2009.

specific good or service. Industrialization replaces evolutionary and ecological processes with monocultures and the heavy hand of human management fueled by fossil fuel inputs.

Our current land ethic is blind to the more cryptic ecological processes by which ecosystems are naturally managed; such as the top-down regulation by keystone predators present in all ecosystems on land and sea, and the interplay over vast scales of space and time between vegetation, ground water and surface water that sustains primary production in the world's rangelands. In addition to disrupting the evolutionary and ecological processes to which Schmitz refers, we are introducing new biological agents into ecosystems which serve as disrupters and degrading influences. In Australia, more than 20 species of mammals have become extinct in the last 150 years as the result of introduced meso-predators (the cat and fox) and introduced herbivores (cattle and sheep)⁴.

We now face the prospect of a further tsunami of disruptions from genetically modified organisms into our agricultural and forestry production systems. GMOs become new players in microevolution and ecological interactions with unknowable consequences. Few people realize these natural processes – including the generation of novel genetic material, natural selection, and predator-prey relations – remain extant even in the most industrialized of landscapes. Our food systems must contend with an ever-changing web of parasites, predators, commensals and competitors. The human health system is also dominated by these interactions with evolving populations of species that live on, in and around us, and seek to use our bodies in various ways for habitat and as a source of resources. Many of these interactions are not just ecological but involve coevolution (the reciprocal evolutionary change in interacting species driven by natural selection)⁵. The fact is that even if we convert all the world's ecosystems into industrial complexes, we will still share our world with a bewildering complex web of life; but one dominated by the smaller and more cryptic elements of current biodiversity. Evolution and ecology will remain at play in food production and human health systems – and we ignore these processes at our peril.

To paraphrase John Dewey⁶, the general nature of humanity's ethical challenge is to make more secure, abundant and widely shared, the things we value and care for in life. The sciences of cosmology, Earth system, evolutionary biology, and ecology are revealing

⁴ *Australian mammal extinctions: a 50,000 year history* by Chris Johnson. Cambridge University Press, 2007.

⁵ *The geographic mosaic of coevolution* by John N. Thompson. University of Chicago Press, 2005.

⁶ *The quest for certainty* by John Dewey, Caripicorn Books/G.P. Putnam's Sons.

fundamental natural phenomena. Knowledge of these phenomena enriches our values system and provides a foundation for an ethic of ecosystem management in this technological age. A bio-sensitive ethic is needed that integrates human needs with our responsibilities for the greater community of life. However, for such an ethic to grow we must open our hearts and minds to our own organic nature, the characteristics and environmental requirements we share with other life forms, and the moral obligations that come with being a species of planetary-scaled powers.

We need an ethic for the *Anthropocene* – the geological era heralded by the coming of humans as a planetary force. This is the kind of ethic Hans Jonas explored in his search of an ethic for the technological age⁷. Such an ethic needs three dimensions:

1. A *land ethic* that is bio-sensitive. Aldo Leopold provided the most compelling argument in western philosophy for the need of a land ethic in the modern world⁸. However, I suggest that his account needs to be augmented by contemporary scientific understanding of evolutionary and ecological processes, along with the implications of the scale of industrialization and transformation the world's ecosystems now face.
2. An *Earth ethic* which articulates our interdependence with and responsibilities for the greater community of life, Earth, and future generations. I recommend the Earth Charter as a good articulation of such an ethic; and
3. A *universal reference*⁹ that provides the ecosystem and planetary perspectives with the necessary context. While cultures have their own cosmologies, the new scientific account presented in *Journey of the Universe* provides an inspiring and common “frame” that all humanity can embrace.

These necessary dimensions of an ethic for the Anthropocene are well illustrated by this quote from the Earth Charter's introduction:

“Humanity is part of a vast, evolving universe. Earth our home, is alive with a unique community of life. The forces of nature make existence a demanding and uncertain adventure, but Earth has provided the conditions essential to life's evolution. The resilience

⁷ *The imperative of responsibility: in search of an ethic for the technological age* by Hans Jonas, University of Chicago Press, 1984.

⁸ *A sand county almanac* by Aldo Leopold, Oxford University Press.

⁹ See *Universe Referenced Citizenship* by Kerry Arabena, PhD Thesis, The Australian National University, 2010.

of the community of life and the well-being of humanity depend upon preserving a healthy biosphere with all its ecological systems, a rich variety of plants and animals, fertile soils, pure water, and clean air. The global environment with its finite resources is a common concern of all peoples. The protection of Earth's vitality, diversity, and beauty is a sacred trust."

A land/Earth/universe-referenced ethic points to ecosystem management that is more about the choices we make to reduce our footprint and facilitate the flourishing of natural processes. This requires we are sensitive to and have deep understanding of the often cryptic evolutionary and ecological processes at play. Generally, such a bio-sensitive ethic will require: allowing natural selection to operate; limiting our use and extraction of ecosystem biomass, water, nutrient and energy stocks; and severely limiting the species (natural and modified) we introduce into ecosystems. At the other end (of what is in reality a continuum) is what we can call a "landscape gardener" ethic; which implies heavier human management with more intense interventions that effectively take the place of natural selection and other processes in picking evolutionary and ecological "winners and losers". In earlier times, when human populations were smaller and our footprint more benign, we could afford to be guided by a landscape gardener ethic over extensive areas of land. But, today and in the coming decades, Earth's ecosystems face a technological onslaught and a more bio-sensitive approach to ecosystem management is called for guided by an ethic appropriate for the Anthropocene.