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"Instead of pursuing the protection of biodiversity for biodiversity's sake, a new conservation should seek to enhance those natural systems that benefit the widest number of people, especially the poor." "Protecting biodiversity for its own sake has not worked. Protecting nature that is dynamic and resilient, that is in our midst rather than far away, and that sustains human communities—these are the ways forward now. Otherwise, conservation will fail, clinging to its old myths" (Kareiva et al., 2011, pp. 36, 37). We need a "New Conservation" ethic. So argue prominent enthusiasts for the Anthropocene.

The International Commission on Stratigraphy has a working group that has recommended Anthropocene as a geological unit (Waters et al., 2016). Beyond the geology, Anthropocene has become a Promethean term, what philosophers call an "elevator word," and put to use revising worldviews, asserting the dominant human place in nature and conservation policy, as in the title of Peter Kareiva, Robert Lalasz, and Michelle Marvier, "Conservation in the Anthropocene." The Anthropocene has its proponents and equally its critics, well illustrated in contrasting views of endangered species and biodiversity.

## An Anthropocene Biosphere

In a *Dictionary of Ecology*, Allaby (2005) tells us: "The biosphere itself, at levels from the genetic to the landscape, is increasingly a human product." These human effects, however, are often negative. Asking about a "safe operating space for humanity," in a feature article in *Nature* in 2009, Rockström argues, using scientific data, that there are nine planetary systems on which humans depend. These can be seen by analysis of: chemical pollution; *climate change*; ocean acidification; stratospheric ozone depletion; *biogeochemical nitrogen–phosphorus cycles*; global freshwater use; changing land use; *biodiversity loss*; and atmospheric aerosol loading. Since the Industrial Revolution, in the three systems italicized the boundaries have already been exceeded (Rockström, 2009). The *Millennium Ecosystem Assessment (2005)* examined 24 ecosystem services and found that 15 are being degraded or used unsustainably.

Sustaining nature's parts and processes in the Anthropocene require maintaining biological diversity. Growing numbers of studies link ecological function across scales of biodiversity from genetic diversity (Crutsinger et al., 2006), to heterogeneity in the spatial arrangement of organisms (Larson and Churchill, 2012), and to landscape heterogeneity within and among ecosystems (Turner et al., 2013). In a major study, Tim Newbold and colleagues ask whether the diversity of life on the Earth has plunged below "safe" levels, and conclude:

Exploitation of terrestrial systems has been vital for human development throughout history, but the cost to biosphere integrity has been high. Slowing or reversing the global loss of local biodiversity will require preserving the remaining areas of natural (primary) vegetation and, so far as possible, restoring human-used lands to natural (secondary) vegetation. Such an outcome would be beneficial for biodiversity, ecosystems, and—at least in the long term—human well-being.

Newbold et al. (2016, p. 291)

Soulé (2013, p. 896) considers the Anthropocene biosphere: "I must conclude that the new conservation, if implemented, would hasten ecological collapse globally, eradicating thousands of kinds of plants and animals and causing inestimable harm to humankind in the long run."

Anthropocene advocates argue that maintaining the landscapes inherited from natural history is an anachronism. They hope to domesticate the landscape and clear it of dangerous (to humans) wildness, preserving and enhancing those biosphere processes that benefit humans. We consider this examining their attitudes toward biodiversity and endangered species.

## Humans and Endangered Species

In recent years some conservation biologists and conservation organizations have sought to refocus the field of conservation biology by de-emphasizing the goal of protecting nature for its own sake in favor of protecting the environment for its benefits to humans. . . . The shift in motivations and goals associated with NCS (New Conservation Science) appear to arise largely from a belief system holding that the needs and wants of humans should be prioritized over any intrinsic or inherent rights and values of nature. . . . Give up on your original goals and focus only on a single species—humans.

Doak et al. (2014, pp. 77, 80)

Here Anthropocene enthusiasts take the moral high ground. Classical conservation has been “socially unjust,” protecting nature rather than needy humans (Kareiva and Marvier, 2012, p. 965).

Conserving biological diversity is made difficult because both plant and animal species will try to follow the climate-driven changes in the ecosystems and habitats in which they evolved (Hannah, 2012; Lovejoy and Hannah, 2005). Some species are much more capable of migrating than others, and this differential mobility will tend to disassemble the existing ecological communities in which biodiversity has flourished. Further, those that can migrate now must traverse landscapes filled with highways, farms, cities, and a rapidly expanding human population that is a feature of, and typically welcomed in, this Anthropocene Epoch (Sample, 2014).

Designated habitat, parks, refuges, and wilderness areas are fixed and not what species on the move need, which is corridors through which they can move. Meanwhile those species who cannot move find themselves challenged in disassembled ecosystems, into which invasives and diseases may move and rainfall patterns may be changing. Droughts increase wildfires. The designated boundaries of the reserves may be fixed, but the climate, plants, and animals within these reserves are rapidly changing, and this undermines biodiversity. Natural ecosystems are dynamic and always changing, of course, but rarely if ever at this speed. The threat is not only change, it is extinction (Caro et al., 2012).

Some may conclude that the fixed reserves are no longer relevant. Others reply that they are as important as ever, but now the scale of conservation policy has to be the larger landscape, bioregions, inhabited lands as well. On this larger scale in the Anthropocene human behavior and its spillover will probably have the largest effect, but, since humans have choices in their more or less predictable patterns of behavior, we do not know and cannot know how much the Anthropocene humans will wish to conserve biodiversity. But the prospects are not encouraging.

In “the science of the Anthropocene,” Ellis (2013) asserts “overpopulation is not the problem.” “We transform ecosystems to sustain ourselves. . . . Our planet’s human carrying capacity emerges from the capabilities of our social science systems and our technologies more than from any environmental limits. The environment will be what we make it.” *The Economist*, in a theme issue, bids us: “Welcome to the Anthropocene: A Man-made World.” They foresee “a civilization of 10 billion reasonably rich people” on a geoengineered, genetically synthetic Earth, rebuilt with humans in center focus (The Economist, 2011, p. 81). Such results seem unlikely to conserve more nature; rather they forebode the end of nature.

## The End of Nature

We are “living through the end of nature” (Wapner, 2010). “In 2100, entire biotas will have been assembled from (1) remnant and reintroduced natives, (2) partly or completely engineered species, and (3) introduced (exotic) species. The term natural will disappear from our working vocabulary” (Soulé, 1989, p. 301). Thompson (2009, p. 79) anticipates our taking “responsibility for the end of nature.” Celebrating what he calls the “Planet of No Return: Human Resilience on an Artificial Earth,” Ellis (2011) concludes: “Most of all, we must not see the Anthropocene as a crisis, but as the beginning of a new geological epoch ripe with human-directed opportunity.” He joins colleagues in the *New York Times*: “The new name is well deserved . . . The Anthropocene does not represent the failure of environmentalism. It is the stage on which a new, more positive and forward-looking environmentalism can be built” (Marris et al., 2011).

Anthropocene enthusiasts point out that humans are already bringing about novel ecosystems composed of new combinations of species under new abiotic conditions. Humans in the Anthropocene need to consider, and experiment with, novel outcomes or trajectories, rather than simply taking preventative or therapeutic measures (Seastedt et al., 2008). We are not going back to once-upon-a-time nature, but beyond nature. Environmental policy and ethics is mostly about intelligently domesticating landscapes. Hobbs et al. (2013) invite us to envision *Novel Ecosystems: Intervening in the New Ecological World Order*.

The way forward is to embrace an ever-increasing human domination of the landscape. Humans are in the driver’s seat. The American Geosciences Institute celebrates “humanity’s defining moment” (Seielstad, 2012). Alley (2011) provides us with: *Earth: The Operator’s Manual*. Earth operators are invited to geoengineering.

## Geoengineered Biodiversity

According to Lynas (2011) and the *National Geographic*, we are “the God species.” “Nature no longer runs the Earth. We do.” “What we call ‘saving the Earth’ will, in practice, require creating and re-creating it again and again for as long as humans inhabit it”

(Shellenberger and Nordhaus, 2011, p. 61). The natural world will be replaced with a designed, and continually redesigned, world. Geoengineering is “the intentional large-scale manipulation of the environment” (Keith, 2000, p. 245).

The editors of a *Scientific American* special issue, *Managing Planet Earth*, ask “What kind of planet do we want? What kind of planet can we get?” (Clark, 1989). Find ways to redistribute rainfall, stop hurricanes and tsunamis, prevent earthquakes, redirect ocean currents, fertilize marine fisheries, manage sea levels, alter landscapes for better food production, and generally make nature more user-friendly. Yoxen (1983, p. 15) urges: “The living world can now be viewed as a vast organic Lego kit inviting combination, hybridisation, and continual rebuilding. Life is manipulability. . . . Thus our image of nature is coming more and more to emphasise human intervention through a process of design.”

In a *BioScience* viewpoint, “Geoengineering and Ecological Ethics in the Anthropocene,” Ben Minteer urges us undertake “the design and management of novel ecosystems that provide valued ecosystem services (e.g., carbon sequestration) yet bear little resemblance to historical landscapes.” He foresees “the eclipse of venerable cultural ideas of wilderness, native species, and the autonomy of a natural world beyond our ken” (Minteer, 2012).

Critics of geoengineering fear that such reengineered ecosystems, with the goal of human benefits, will result in reduced biodiversity, perhaps not by intentional design, but as an inevitable result. The Anthropocene proponents may at this point reply that they do indeed wish to save tokens of such wild life and natural processes in natural reserves that they designate. These refuges will be useful in various ways: reservoirs of natural resources for the future, museums of the past, parks for recreation, for environmental education, perhaps pockets of baseline processes as a reference for planetary engineering.

Humans, of course, had nothing to do with the genesis of any of these basic conditions. Managing the planet, humans are not likely to reconstruct global rainfall patterns, or photosynthesis, or trophic pyramids, or global genetic coding and speciation, or heterotroph–autotroph relations, or bird migrations, or what earthworms do in soils and insects do pollinating, or any other of the basic systems that nature provides. Perhaps, taking responsibility, we can limit or repair some damages we have introduced (global warming, ocean currents, toxics, and extinctions), but that we might reengineer these foundational grounding systems for increased human benefits is overblown fantasy.

At this point other Anthropocene proponents may say that they are not trying to rebuild the basic ecological processes on land or sea. Rather they hope to allow biospheric nature to continue below by fixing the stratospheric sky above. Several such schemes involve engineering a protective layer of aerosol reflector particles to help cool the planet. There would be an unnatural umbrella layer spread over so as to protect the natural landscape layer, something like the natural ozone layer already does.

Geoengineering could provide a useful defense for the planet—an emergency shield that could be deployed if surprisingly nasty climatic shifts put vital ecosystems and billions of people at risk (Victor et al., 2009, p. 66; Launder and Thompson, 2010). We are hedging disaster, buying insurance. But now the geoengineers will find that their engineering is not just a technical problem; they have to consider the social contexts in which they launch their gigantic projects, the welfare and risks of those they seek to save, the (in)justice of geoengineering that spreads benefits and costs inequitably, the governance of geoengineering (Parson and Keith, 2013). Anthropocene engineers are no better equipped to deal with transdisciplinary systems problems than are Anthropocene politicians. Or with the ethical problems. They may find a majority of the Earth’s residents wondering: Is our only relationship to nature one of engineering it for the better?

## Ecomodern Conservation

A more considered if still Anthropocene future is celebrated in *An Ecomodernist Manifesto*, advocated by a dozen and a half international environmental leaders (Asafu-Adjaye et al., 2015). These ecomodernists hope for “an ecologically vibrant planet” (p. 31). Surely this modern humanism will treasure ecosystem services. But no. These ecomodernists anticipate what they call “decoupling.” “Human technologies . . . have made humans less reliant upon the many ecosystems that once provided their only sustenance” (p. 9). Yes, technology can be “double-edged” (p. 17); there is serious threat of environmental deterioration, such as with climate change, or pollution, but future humans can fix these human-caused problems.

With increasing industrial agriculture and rising harvest yields, there are no foreseeable limits to producing food. People now are free to and prefer to live in cities, and they will prefer fewer children. This frees up landscapes no longer needed. So the freer humans are, the more they can let selected natural areas go free, wildlands, restored forests. Humans will, of course, often want to recreate in such areas, they are even freer if they have such opportunity. Humans encountering original nature can be “important for their psychological and spiritual well-being” (p. 25).

“Taken together, these trends mean that the total human impact on the environment, including land-use change, overexploitation, and pollution, can peak and decline this century. By understanding and promoting these emergent processes, humans have the opportunity to rewild and regreen the Earth—even as developing countries achieve modern living standards, and material poverty ends” (p. 15). Such decoupling results in more freedom for humans and more freedom for nature. “Decoupling raises the possibility that societies might achieve peak human impact without intruding much further on relatively untouched areas. Nature unused is nature spared” (p. 19).

By this account, we need to become increasingly high tech to save nature. When human progress is progressively upscaled, peaked out, managing an engineered planet, the importance of ecosystem services is downscaled. There is nothing here of nature in symbiosis with technology, nothing of interdependence, only high-tech decoupling on a polarized natural/Anthropocene planet.

## Creative Biogenesis

Critics worry about the intentions, which, though they sound high and moral, may have an immoral trailer. “Forward for me and my kind!” We are at “the end of the wild” (Meyer, 2006). The subtext of these “old myths” of classical conservation ethics, seems to be the myth that wild life, or ecosystems, or biodiversity, or evolutionary creative genesis might have a good of its own, an intrinsic value worth protecting. This is the Anthropocene, and too bad for the not anthropos. Anthropocene proponents are concerned to get people fed, even if doing so drives, tigers, and butterflies into extinction.

Kareiva and Marvier urge us to shift “from a focus almost exclusively on biodiversity to one on multiobjective planning and priority setting” with more attention to “human well-being. . . . Conservation is fundamentally an expression of human values. . . . Today we need a more integrative approach in which the centrality of humans is recognized.” “We do not wish to undermine the ethical motivations for conservation action. We argue that nature also merits conservation for very practical and more self-centered reasons concerning what nature and healthy ecosystems provide to humanity” (Kareiva and Marvier, 2012, pp. 963, 965). Despite the caveat, ethical concern for nonhumans is soon undermined. We are told that once-abundant species can vanish with no ill effects on humans—the bison, the chestnut, the passenger pigeon, the dodo, tigers, and butterflies—and that concern for further such losses is mere “nostalgia.”

The Anthropocene might prove a dangerous idea, because it impoverishes us. Peter Kareiva and Michelle Marvier, arguing “Conservation for the People” in the *Scientific American*, dismiss the old reason that “we have an ethical obligation to save the world’s biodiversity for its own sake.” That should be “largely scrapped in favor of an approach that emphasizes saving ecosystems that have value to people.” “Human health and well-being should be central to conservation efforts” (Kareiva and Marvier, 2007). What we must push for, according to the Royal Society of London, is “sustainable intensification” of reaping the benefits of exploiting the Earth. Would not the world’s oldest scientific society be as well advised to ask about protecting (preserving) ancient and ongoing biodiversity, about whether treading softly is wiser than ever-intensifying our imperial exploitation?

With this human benefits focus, we wear a set of blinders to nonhuman others. We value our human eyes. Deep sea fish, squid, mantis shrimp, living where light is dim or absent, have evolved spectacular (using the word advisedly) “visual systems that are very different and much more sophisticated than our own,” collecting, producing, processing light. “There’s a whole language of light down there, and we are barely beginning to understand it,” report marine scientists in a news focus in *Science* (Mar. 9, 2012). And so? Out of (our) sight, out of mind? Save them only if they might provide resources for some useful optics or telecommunications research? Or value them for the good of their own supersight, light-fantastic lives?

Every organism has a good-of-its-kind; it defends its own kind as a good kind. Conservation biology did not start with us humans late and lonely; conservation biology has been going on since the origins of life. That seems to recognize value in nature as pretty much fact of the matter. Only arrogant humans, ignorant of biology, will claim otherwise. But this is not simply bad biology. Now it further seems morally offensive for *Homo sapiens*, the sole reflective moral species, to use its conscience to act only in its collective self-interest toward the rest.

Environmental ethicists here reply that rebuilding the planet with humans at the center, or even protecting ecosystem services, no longer sounds like the high moral ground. The bold new approach instead puts *Homo sapiens* the first, if not the only location of moral relevance. Justice is just-us. Have humans ever been in danger of not sufficiently looking out for their own interests? If our concern is for the poor in this new humanist excellence, emphasize environmental justice, the more equitable distribution of wealth between rich and poor on developed lands, rather than diminishing wild nature to benefit the poor. Solve the problem in the right place.

There is a pivotal tradeoff in such challenge: Thompson (2010, pp. 43, 56), an environmental philosopher, with a “radical hope for living well in a warmer world” (his title), urges us to find a significantly “diminished place for valuing naturalness” replacing it with a new kind of “environmental goodness . . . distinct from nature’s autonomy.” Will such displacement of wildness, of intrinsic value in nature, of autonomous biodiversity, really further human excellence?

Only about 2.7% of the contiguous United States is protected—about the area of Minnesota. Over 97% is worked over—farmed, grazed, timbered, hunted, dwelt upon, or otherwise human possessed. Surely that is enough, if we have any concern for preserving fragments of the plentitude of biodiversity once native to our continent. Surely, if we are to manage more effectively, that ought to be done on the over-sized 97% we already have taken into our human orbit.

There are multiple dimensions of naturalness, on both public and private lands. George Peterken, British ecologist, has an eight-point scale. Even on long-settled landscapes there can natural woodlands, treasured by owners over centuries. There may be native woodlands, often with quite old trees, secondary woodlands with trees 50–100 years old, recently restored woodlands, wetlands, moors, hedgerows, mountains, such as the Alps or the Scottish Cairngorms (Peterken, 1996). Aplet (1999), a US forest ecologist, distinguishes 12 landscape zones, placed on axes of human “controlled” to autonomously “self-willed” and “pristine” to “novel.” Rather than seeking to go enthusiastically into the Anthropocene, why not claim that there are and ought to be various degrees of the preservation/Anthropocene spectrum?

Globally, although a diminishing part of the landscape, there are still large areas that are dominantly wild. In an inventory of wilderness remaining, McCloskey and Spalding (1989) find that all of the settled continents (excluding Europe) are between one-third and one-fourth wilderness. We should have intelligent discussion about how much should remain wild. We might favor the hotspots of biodiversity or refuges with endangered species. Or favor capstone or charismatic species.

Confronting such choices, many resist the claim that the Earth is already or will inevitably become an Anthropocene planet. There are on differing places on the landscape, various degrees of the Anthropocene (0% Anthropocene to 100% Anthropocene), with most of the terrestrial Earth only part way there—and with options about how much further into the Anthropocene we want to go. The dominant hope is that “the trajectory of the Anthropocene” is “The Great Acceleration” (Steffen et al., 2015). A better hope is for a *tapestry* of cultural and natural values, not a *trajectory* even further into the Anthropocene.

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