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Discussion

# Sustainable development as *deus ex machina*

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ABSTRACT

The advocacy of sustainable development (SD) by governments, NGOs and scientists over the last three decades has failed to diminish the alarming species extinction rate fueled by overuse and habitat destruction. Attempts to satisfy worldwide demands for economic growth and development have, in fact, thwarted conservation efforts and greatly diminished the diversity and abundance of life forms, including key iconic species. Here, we argue that this crisis is one of values rooted in a discourse that justifies development and downplays the morality of human-caused extinction of life forms. The language of SD does not convey the loss—worse, it masks or rationalizes it as blameless or necessary. The language of SD represents the loss in biodiversity as fallout from the reduced capacity of ecosystems to provide services for human benefit, while providing no sense of the values necessary for conserving life for its own sake. We have never been in possession of an intelligible notion of such values; this includes the concept of the "intrinsic value" of nature. Language is at the center of our difficulties. We must consider the limits of language to express the value of life. This has theoretical and practical relevance for conservation planning and interventions.



## 1. Introduction

These are difficult times for conservationists as we live in a world of human hostility to other forms of natural life (White, 1967). The institutionalized conservation movement, particularly the branch oriented to the preservation of species, faces two fundamental, interrelated crises. One is the well-known crisis of the wanton exploitation of nature and the crashing of wildlife populations, indicated by the increase in the rate of species threatened with extinction (International Union for the Conservation of Nature (IUCN) Red List, 2015; see also Living Planet Report 2016. This human induced crisis of species and population extinctions, and of loss in abundance (e.g., Dirzo et al., 2014; Ceballos et al., 2015; see also threats in the IUCN Red List (2015), we refer to as the Crisis of Life, which includes the destruction of species via habitat loss, overexploitation and climate change. The other is the philosophical crisis within the conservation movement: a crisis that originates in language (Campagna and Guevara, 2014; Hance, 2016). The sustainable development (SD) model of conservation, for all the good intentions behind it, has done little to diminish either crisis (Brown, 2013; Ashish et al., 2015; Francis, 2015). Rather, its discourse sustains and augments the Crisis of Life. Our aim is to focus on the anthropocentric language of SD that represents nature as having mainly instrumental value, a perspective that dominates many environmental, governmental and multilateral agencies (e.g., the United Nations Environment Program, the European Environment Agency), international conservation organizations of the civil society (Campagna and Fernández, 2007), and even the science of conservation (e.g., Ehrlich et al., 2012). SD is a conceptual impediment (Campagna, 2013). It obstructs alternative views by constraining our thinking, monopolizing funds for research, and making it impossible to articulate a compelling moral imperative against wanton species extinctions.

Our point is that: (i) we must abandon the instrumentalist discourse championed by the SD model if we are to break through to an authentic and compelling ethical commitment to nature and life, and (ii) we must begin to investigate rigorous foundations for a new ethic and discourse. We are indebted to Thoreau and Leopold, and other master critics of the purely instrumental valuation of nature. Here, we emphasize the importance of language and its essential role in bringing about a new ethic of conservation.

## 2. The crisis of life

The IUCN (2015) Red List and many other sources document the facts of the Crisis of Life (Stuart et al., 2004; Butchart et al., 2004;

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Carpenter et al., 2008; Schipper et al., 2008; Hoffmann et al., 2010; Barnovsky, 2014; see also the Living Planet Report 2016). The November 2015 version of the Red List included 79,837 species of which 23,250 were listed as threatened with extinction, more than 4000 at the edge of extinction, and more than 900 as extinct or as existing only in captive conditions (IUCN, 2015). Defaunation, a neologism that refers to the loss in the abundance of wildlife on land and in the oceans (Dirzo et al., 2014; McCauley et al., 2015), includes some of the most iconic species at the epicenter of conservation efforts, e.g., black rhino, *Diceros bicornis*, African lion, *Panthera leo*, African elephant, *Loxodonta africana*, tiger, *Panthera tigris*, polar bear, *Ursus maritimus*, and blue whale, *Balaenoptera musculus*. These animals are listed as vulnerable, endangered or critically endangered. The loss of biodiversity among apex predators triggers cascading effects on lower species that results in more loss of biodiversity (Estes et al., 2011). Foundation species are impaired by deforestation and reduction of coral reef and mangrove habitats (Angelini et al., 2011). In 2014 and 2015, 41% of assessed amphibians (87% of described species), 33% of reef-building corals, 26% of mammals, 13% of birds, and 34% of conifers were threatened with imminent extinction. Amphibians are the most threatened taxon of all the vertebrates (Stuart et al., 2004). Fifty-two species of mammals, birds, and amphibians move one category closer to extinction each year (Hoffmann et al., 2010). Ecosystem and habitat degradation is rampant (e.g., Sanderson et al., 2002; Halpern et al., 2008; see also: Millennium Ecosystem Assessment (2005) and NASA Socioeconomic Data and Application Center (2015): Last of the Wild V2). Reef-forming corals, that support the highest marine biodiversity, are being destroyed faster than any other life form (Carpenter et al., 2008). A perfect storm is brewing to trigger a mass extinction comparable to, and perhaps greater than, the five mass extinctions that destroyed 76 to 96% of the life forms that existed over the last 443 million years (Barnovsky, 2014).

Efforts over the last 30 years, since the Brundtland Commission (1987) Report, call attention to this crisis, but simply making the data public has not reversed or mitigated the crisis, or moved the public to grapple with its moral significance. There have been successes in conservation (e.g., Hoffmann et al., 2010; Soorae, 2016) but the crisis is more urgent today than half a century ago, as illustrated by the IUCN Red List, one of many indicators. Most people do not recognize any moral urgency to address this crisis. In fact, search patterns on the web indicate a diminished interest in the environment (Mccallum and Bury, 2013). Human interest continues to focus on the loss of economic opportunities, particularly those caused by climate change (e.g., Hsiang et al., 2013; National Geographic November 2015).

## 3. The conservation movement: structural considerations

The conservation movement reflects a mélange of viewpoints that includes a heterogeneous constellation of organizations, agencies, approaches, visions and values. There is no unified agenda, no focal goal or widely adopted definition of conservation, or integrated plan for how to address the Crisis of Life. There are also wide cultural differences regarding the treatment of non-human life forms. Nevertheless, some generalities about conservation efforts and the crisis can be discerned.

### 3.1. The SD agenda dominates

The SD paradigm dominates and is differentially promoted by multilateral, intergovernmental, regional and governmental organizations (e.g., UN development institutions behind the Millennium and Sustainable Development Goals, and the World Bank). It prevails in the language of the mission, priorities and policies of the most influential international NGOs such as WWF, Fauna and Flora International or Conservation International, as well as of the IUCN. The mission and vision statements of these organizations use the instrumentalist language and concepts of the SD paradigm (Campagna and Fernández, 2007). SD language is widely adopted by academics and has been promoted by the so-called "New Conservation" movement (e.g., Kareiva et al., 2012; Marvier, 2014a), which has an unequivocal anthropocentric emphasis. Indeed, most conservation efforts in planning, policy, and management utilize the rationale and working principles associated with SD. There is a small biocentric conservation community that departs from strict anthropocentric, instrumentalist principles (e.g., Wuerthner et al., 2014), and some pragmatists that support an "ecumenical", ethical pluralism that encourages "what works" (Robinson, 2011; Marvier, 2014b; see also Hunter et al., 2014; Tallis and Lubchenco, 2014).

### 3.2. Species-centered conservation

We are primarily concerned with species and populations that have gone extinct, or are threatened with extinction by overexploitation and habitat destruction. The globalized environmental agenda has broader concerns, including everything from ecosystems to biological function, poverty alleviation, human sanitation and livelihoods (e.g., UN Millenium Development Goals, 2006; UN Sustainable Development Goals, 2015). Within the context of human-centered "environmental issues", other species are marginalized or treated as resources to be utilized. The language of this broader movement often embraces the anthropocentric agenda, as though it were seamlessly and unproblematically of a piece with biocentrism or with alleviating the Crisis of Life. In fact, the opposite is true: in SD discourse, the non-human forms of life are routinely referred to as "natural capital" (defined by the World Forum on Natural Capital as the world's stock of natural assets, see: http://naturalcapitalforum.com/about/), "renewable resources," and "ecosystem goods." Likewise, ecosystems and habitats provide "environmental services" and people are "stakeholders" of "green stocks" (e.g., Costanza et al., 1997; Hawken et al., 1999; Norgaard, 2010; Farley et al., 2015; Morelli and Møller, 2015). These terms belong to a family of instrumentalist conceptions of value that is in wide use. A web search of "natural capital" yields twenty times more results than the phrase "intrinsic value of nature", four times less frequent than the phrase "ecosystem services." Use of the phrase "ecosystem service" in the last decade, reflected by Google Trends, shows an expansion in frequency, consistent with the use of the concept in the conservation literature (Morelli and Møller, 2015). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an intergovernmental body with the mission of assessing the state of biodiversity in the context of ecosystem services (http://www.ipbes.net/about-us).

Constanza and co-authors point out that, "valuation of eco-services (in whatever units) is not the same as commodification or privatization" (Costanza et al., 2014). Nevertheless the discourse of natural services and assets is patently useless or counter-productive for expressing and comprehending the value of life itself, in its great diversity of forms. It relegates value to its utility for human development (often of questionable value for the majority of human beings themselves). As Neuteleers and Engelen (2015) note: "Monetary valuation of ecosystem services does not equate to commodification…, but it paves the way (discursively and sometimes technically) for commodification to happen."

### 3.3. The extinction crisis is driven by humans

Humans are taking over much of the earth's surface, killing other species directly and destroying where they live. One of the most important finding of the Millennium Ecosystem Assessment (2005) states: "Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth."

The UN Millennium and Sustainable Development Goals address and integrate the synergy between environmental threats, development, poverty and ignorance, but there is another side of the conservation crisis that involves carelessness and even intentionality. Many decisions that impact environments negatively are not due to ignorance, survival needs or accident. The forces driving the Crisis of Life are well understood by many people, societies, cultures and governments. For example, overconsumption in wealthy societies, food waste as in fisheries and agricultural discards, persistence in development strategies known to be detrimental to life forms, and reproductive negligence, are but some of numerous examples of a careless attitude with regard to nature. Social inequality, buttressed by growth economic models, further fuels the crisis (Daly, 1973; Ehrlich et al., 2012). Species lost are tabulated on account ledgers as transitory collateral damage that will ultimately serve the development cause.

The incipient Anthropocene mass extinction differs from previous mass extinctions (Barnovsky, 2014; Ceballos et al., 2015). We must own up to the fact that the crisis is due to the widely known preferences of a segment of humanity that benefits from it most (Mathews, 2016). There is a human moral component in the current incipient mass extinction that was absent in previous mass extinctions.

## 4. SD as *deus ex machina*

The concept of SD can be traced back to 1980 (Lélé, 1991; Robinson, 1993); it was popularized by the Brundtland Commission (1987) and the subsequent Brundtland Report (also known as "Our Common Future"). It was introduced with a broad-brush and vague definition: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Since then, the words "sustainable" and "sustainability," have become jargon, connoting something like "environmentally friendly", but are now essentially meaningless, since they have been used in so many radically different contexts and ways, from sustainable energy and economic growth, to homes, supply chains and running shoes (Greenberg, 2013).

Development requires balancing social, economic and environmental objectives that are usually in conflict (Norgaard, 2010). An essential part of the initial idea was that SD would address the challenges faced by humanity, while not impacting the carrying capacity of natural systems (Brundtland Commission, 1987). That is, in addition to traditional developmental objectives for positive social change, there would be the objective of ecological sustainability (Lélé, 1991). Thus, SD was lauded as the path to a desirable synergy of human needs with the needs of other life forms. Indeed, its attraction was that it promised reconciliation of the conflict of interest between the goals of development and those of the environmental communities. SD appeared to be an approach that would provide a rapprochement, a resolution of this conflict, like the *deus ex machina* in Greek theatre, where the gods come on stage in the final act to resolve the plot or provide a palatable ending. But SD, like the god machine, turns out to be an inept plot device, one that strains credulity because it does not pay due regard to the story's internal logic or inherent conflicts.

These conflicts are routinely ignored when we are told that human welfare must be addressed through economic development and yet not be detrimental to nature. This directive involves both a logical contradiction and a conflict of interest. Development is not consistent with the flourishing of nature, and there is therefore a conflict of interest between development for human welfare and the welfare of the rest of nature (Robinson, 1993; Czech, 2008; Raudsepp-Hearne et al., 2010). Development, such as in the case of forestry, commercial fisheries, expansion of the agricultural frontier, urbanization, river dams, or large-scale industries, destroys habitats and the lives of the inhabitants of countless life forms, humans included. Thus, under the auspices of SD, the species extinction rate continues to increase unabated, and biodiversity (both viability and abundance of species *sensu* Mathews, 2016) has decreased. This fact is acknowledged by international intergovernmental agencies that provide the strongest support to the instrumentalist paradigm (e.g. Millennium Ecosystem Assessment, 2005; UN Sustainable Development Goals, 2017).

We have, therefore, strong prima facie evidence that the discourse of SD cannot stem the crisis, and, instead, may be a contributing cause due to the influence of its discourse on value systems. The Convention of Biological Diversity attempted to reconcile conservation value systems with the homocentric idea that what is good for us is good for nature. The final irony is that the same countries, that pretend to subscribe to the sustainability agenda, permit and encourage practices within their territories, the territories of other countries, or in the commons, that defeat the purpose, such as subsidies to fisheries (Pauly and Zeller, 2016; Sumaila et al., 2016).

The inadequacy of the SD paradigm has been stated before (e.g., Lélé, 1991; Robinson, 1993; Redclift, 2005). SD has been recognized as no more than traditional development appropriating the language of conservation (Robinson, 1993). As with the example of the UN Millennium Ecosystem Assessment (2005) above, even voices representative of the paradigm admit that there is a problem: "The world is experiencing unprecedented prosperity, while the planet is under unprecedented stress." (Raudsepp-Hearne et al., 2010; United Nations Secretary–General's High–level Panel on Global Sustainability, 2012; Barnovsky and Hadly, 2015; Worster, 2016). But the UN Panel blames this on the fact that development is not yet sustainable and then advises us to persevere and persist in the application of the model, indicating total blindness to the link between unprecedented prosperity and unprecedented stress to nature.

Despite these recognized weaknesses, SD has had a remarkably long influence on conservation science to this day. For example, the 2017 Australia and New Zealand regional meeting of the International Society for Ecological Economics has the theme: "The 99% Solution: Implementing the Sustainable Development Goals." Perhaps SD has endured, in part, because humans are pressured to do something in a crisis, even if its effectiveness is dubious and involves internal contradictions. SD gives the impression that something is being done, allowing conservationists to state that "we are working on it." The word "sustainable" elicits unquestionable positive associations of the sort that advertising agencies envy.

It is unfortunate that things have turned out this way but it should be no surprise. We began, and proceed to this day, with well-conceived, keenly felt, commitments to human values, but with essentially no understanding of the value for the rest of nature by comparison. When hard choices are to be made, the values we know and can express are favored. The SD god machine does not save the day.

## 5. The crisis of life is a value crisis

The 1987 Brundtland Commission's report, which set the global SD agenda, describes the strategy for species conservation and how it can be achieved and at what acceptable costs. This has become the world's model for how humanity should view and treat life. The gist of the report is this: since all nations have limited resources, conservation priorities must be set in order to decide which particular species to save: "Every nation has only limited resources at its disposal for dealing with conservation priorities… Explicit efforts to save particular species will be possible for only relatively few of the more spectacular or important ones. As agonizing as it will be to make such choices, planners need to make conservation strategies as systematically selective as possible… Some genetic variability inevitably will be lost, but all species should be safeguarded to the extent that it is technically, economically, and politically feasible."

In other words, we, the rational species, decide what life will be permitted to exist on the planet, and—under the institutions of representative governments—which life forms society can do without. Preventing species extinctions is a worthy goal but only so long as the action taken does not hinder the "needs" of humans. Documents inspired by the SD

directive follow a similar discourse and dialectic. The Convention of Biological Diversity (CBD) is "dedicated to promoting sustainable development" (https://www.cbd.int/convention/).

Since the language of the Brundtland Report is three decades old, one would expect the goals, targets and vision of SD to have become more enlightened with time. Species conservation has been addressed as essential to development goals (as in the UN Sustainable Development Goals) and species have been at the center of important declarations (e.g., https://www.gov.uk/government/publications/declaration-london-conference-on-the-illegal-wildlife-trade; see also Convention of Biological Diversity Aichi target 12: https://www.cbd.int/sp/targets/). New language has even expressed the intention to decouple growth from exploitation of nature (e.g., http://ec.europa.eu/dgs/environment/index_en.htm). The place of nature in the value system, however, has not changed fundamentally. Instead, SD has followed a steep and thorny path that has led to the embrace of a value system that accepts compromising life as the unavoidable collateral casualty of economic development for human benefit. This stratagem is supported by a cost-benefit analysis and the consideration of trade-offs, all morally questionable. Meanwhile, human development continues to destabilize biological, chemical, and climatic boundaries, posing risks to the integrity of essential planetary systems (Steffen et al., 2015).

SD has become so entrenched that drifting from its canon is synonymous with opposing what is good for the human species, while the cost to other forms of life is hardly mentioned, much less elaborated and articulated as a value comparable to human costs. From this perspective, even nature is not entitled to a free ride, it either serves the cause of development or it is of no consequence. Financial support for conservation can no longer be expected unless proposals are aligned ideologically with the thrust and the narrative of SD and its homocentric goals. The consequence is a compromise in the mission of the conservation movement, particularly that sustained by large non-government organizations (e.g., Hance, 2016), despite questionable positive effects for the conservation of biodiversity (Robinson, 2012).

## 6. The challenge of establishing a new sense of responsibility

Resistance to the SD model is mounting in the academic conservation community (Miller et al., 2014). The contradiction between SD and ecological viability is acknowledged, and emergent concepts, such as de-growth, challenge the traditional foundation of capitalist economics based on economic growth (e.g., Asara et al., 2015). Conservation of biodiversity, as the CBD conceives it, has been criticized for channeling policy efforts into an "ecology of the minimal," compatible with exploitation and supporting species viability by doing only just enough to keep a population going, but nothing to keep it abundant (Mathews, 2016). Assigning a price, not a moral value, to nature is seen as wrong (Morelli and Møller, 2015), since commodification discourse may lead to similar moral problems as real commodification (Neuteleers and Engelen, 2015). It has been recognized that simplistic, instrumentalist terms such as "ecosystem services," meant to illustrate a dependency of humanity on nature, obscure the complexities of the challenges that must be faced (Norgaard, 2010).

It is rarely noted, however, that if we reject the seductive appeal of SD ethics as a mirage that disguises business as usual, we are left with the hard task of articulating the value of nature on other grounds. The task is problematic because it threatens the ethics with which we are familiar. Our familiar ethical responsibilities are complex and demanding, and the potential increase in our obligations by their proposed extension to the rest of nature is enormous. There exists virtually no agreement about the basis for adjudicating the ethical conflict and confusion that such an extension can involve. What are the principles? How do we apply them? May we just apply familiar ethical categories to nature in general? What are the moral comparisons to the catastrophic extinction of life by human development? What do we do when a species is close to extinction? Do we hold a wake, a funeral, or perform a requiem? Do we draw comparisons to the worst in the killing of human beings? Although there are many who see human-induced species extinction as a great wrong (e.g., Cafaro and Primack, 2014), by and large we do not dwell on the moral implications of the loss.

Here are examples of the most influential attempts to extend ethical responsibilities to the rest of nature on a basis other than the anthropocentric, instrumentalist model of SD.

### 6.1. Animal rights

The popular animal liberation movement, spearheaded by Peter Singer, extends direct ethical concern to all beings that can feel pleasure or pain (Singer, 2009). This is classical utilitarian moral theory inasmuch as Singer believes we are obligated to maximize pleasure (or minimize pain) over all such beings. From a language perspective, this means applying familiar, fundamental ethical discourse pertaining to humans to a few non-human species, including domesticated animals. The emphasis is on life forms that are sentient. The view identifies a plausible, non-anthropocentric notion of intrinsic value as consisting in the pleasure or happiness of sentient beings. The limitations of such a view are obvious to anyone wishing to comprehend the intrinsic value of nature, including non-sentient forms of life.

### 6.2. Intrinsic value of nature

"Intrinsic value" is a term of art taken from ethical theory (Stanford Encyclopedia of Philosophy: http://plato.stanford.edu/entries/value-intrinsic-extrinsic/; Hirose and Olson, 2015), referring to the value something has due to its own intrinsic properties, as opposed to values it has as a mere means to something else of value. Common usage more or less reflects this technical meaning. The intrinsic value of nature in this sense has been supported by the most influential figures in the history of the conservation and environmental movement, e.g., Thoreau (1995), Muir (2006), Leopold (1949) and their influential disciples, e.g., Michael Soulé, and those in the Deep Ecology movement (Sessions, 1995). The concept is used widely as an alternative to the instrumental conception of nature (e.g., Morelli and Møller, 2015; see also Vucetich et al., 2015). Faith-based ethical systems, illustrated by Pope Francis' (2015) *Laudato Si*, extend duties to all forms of life based on their sacred value, which is a kind of intrinsic value. But "intrinsic value of nature," in this common but varied usage, seems at best a mere place holder concept to be filled in by something more specific, something that can compete, e.g., with the plausible idea of pleasure or happiness as intrinsically valuable. The temptation and danger is to fill the empty concept with something ready to hand, that we already think we understand, and that immediately allows us to extend it in the wished-for direction, but which leads only to a dead end. If we are not religious, we cannot simply adopt religious terms for example, since they get their specific meaning from the religious views from which they were developed.

Leopold's famous saying: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise," deserves the consideration it has attracted as a possible secular first principle. But Leopold, unlike Deep Ecologists, did not begin to build a rigorous ethical system from this saying, one that could tell us specifically and systematically what actions are right or wrong and why. Leopold understood that the language we have is not yet the language we need. Meditating on "the quality of the crane" he exclaims that it "lies in [a] higher gamut, as yet beyond the reach of words." He cites this as an instance of a general boundary in language, noting that "[o]ur ability to perceive quality in nature begins, as in art, with the pretty. It expands through successive stages of the beautiful to values as yet captured by language (Leopold, 1986)."

One reason that Deep Ecology has not gained broad support is that there is so little agreement about the meaning of the key terms, e.g., "integrity" in Leopold"s saying. Most agreed-upon ethical meaning of such

a term is found in traditional, non-utilitarian ethical theories, notably, Kantian or neo-Aristotelian, and their concept of the integrity of a person.

### 6.3. Kantian and neo-Aristotelian morality

Kantian and Aristotelian theories are, next to utilitarianism, the most influential ethical theories but we hit dead ends rather quickly when trying to extend these types of theories to the rest of nature. Among widely discussed applications of such theories, Martha Nussbaum (2007), entertains the possibility that we might be obligated to intervene on behalf of prey in nature (the deer for example), protecting it from its natural predator (the mountain lion). She senses that this is absurd, but is forced to entertain the conclusion by the ethical theories and traditions she is trying to extend to the rest of nature. Kantian and neo-Aristotelian conceptions of intrinsic value consist in the integrity of rational agents, understood in terms of their dignity and autonomy. Thus, a moral act towards nature, inspired by the value of the integrity of a rational being, would lead towards absurd attitudes and decisions. Obviously, we look in vain here too for an adequate understanding of the intrinsic value of nature.

## 7. The role of language

Our critique of SD shows that conservation cannot dismiss controversies about language as mere semantics. We deceive ourselves when we do so, and allow many of the worst things that have transpired regarding species conservation, especially regarding our understanding of the values involved. Inattention to language has impeded and distorted our understanding of the values that sparked the beginning of the conservation movement. This was bound to happen, considering the central role that the concept of development plays in the value system of the SD paradigm.

The writers of the Brundtland Report (1987) were aware of the important role of language in setting values: “Species problems tend to be perceived largely in scientific and conservationist terms rather than as a leading economic and resource concern. Thus the issue lacks political clout.” For the sake of political clout, the language of SD has been chosen strategically to emphasize a human-centered instrumentalist agenda. The recent controversy between new conservation scientists and the more traditional conservation biologists (e.g., Kareiva and Marvier, 2007, 2012; Miller et al., 2014; Soulé, 2013) should come as no surprise. The language of the “new” conservationists is simply part of the logic of SD, while the latter speaks in vague terms of the “intrinsic value” of nature.

Language is not just a tool for expression but a basis and enabler of thinking and emotions. We agree with Wittgenstein (1958) who says: “When I think in language, there aren't 'meanings' going through my mind in addition to the verbal expressions: the language is itself the vehicle of thought”. The role of language in thought has been addressed in literary disciplines. Aldous Huxley, in Brave New World, said: “Words can be like X-rays if you use them properly — they'll go through anything. You read and you're pierced.”

Language influences and consolidates ethical positions, inspires interventions and offers hindsight. Objective facts, such as the Red List, exert a positive influence by providing evidence to oppose skepticism about the crisis of extinction, but they may not be sufficient to effect the profound ethical changes needed (Campagna, 2013). Svetlana Alexievich, winner of the 2015 Nobel Prize in Literature, provides an example outside of the field of conservation. The Chernobyl disaster first reached the world as a factual enumeration of the casualties. Alexievich transforms this disaster into a tragedy of humanity by simply telling the stories of the individuals. Her personal accounts, told in everyday language, were more effective in communicating the moral horror than simply enumerating casualties (Alexievich, 2006). This suggests that when the Crisis of Life is narrated predominantly as information in the language of science, it may be incorporated into a value system that justifies the loss of life forms as unavoidable collateral damage to the protection of national economies, as in the following citation from Our Common Future (Brundtland Commission, 1987): “Every nation has only limited resources at its disposal for dealing with conservation priorities… Explicit efforts to save particular species will be possible for only relatively few of the more spectacular or important ones. Agonizing as it will be to make such choices, planners need to make conservation strategies as systematically selective as possible. No one cares for the prospect of consigning threatened species to oblivion. But insofar as choices are already being made, unwittingly, they should be made with selective discretion that takes into account the impact of the extinction of a species upon the biosphere or on the integrity of a given ecosystem.”

Language in the form of new descriptors is associated with the origin of scientific disciplines (Schulz, 2015). The beginnings of climatological science illustrate the importance of creating terms to communicate phenomena relevant to the discipline, such as explaining storms in terms of weather patterns as opposed to Acts of God (Schulz, 2015).

Rhetorical effects, such as metaphors, influence our way of seeing things (Ball, 2011; Boroditsky, 2011; Pauwels, 2013). For example, the views of people on how to manage crime vary drastically, depending on whether they are told that criminal activity is a “virus” or a “wild beast” (Thibodeau and Boroditsky, 2011). In the beast case, people want more police, harsher jail sentences, or a hunting party, things you need to control a real beast. For a virus people want more preventative solutions such as diagnosing the root cause of the problem, inoculating the population, improving education, and dealing with economic problems in the community to reduce the crime rate. Likewise, the language that links ecosystems with services, as provided by an airline or a telephone company, may have started “as a humble metaphor to help us think about our relation to nature [but] has become integral to how we are addressing the future of humanity and the course of biological evolution” (Norgaard, 2010).

In summary, addressing the Crisis of Life requires revisiting the narrative as well as the theory of values imparted by the language of conservation and their normative consequences (Mathews, 2016). The extensive field of environmental ethics is rife with arguments in support of one or another value system, but it is much less about the role of language in clarifying the source of those values we best understand, and thus seems not to require us to be rigorous in thinking through the ethical implications for nature. SD was taken up quickly because it falls back on the human-centered values that we best understand, and thus it seems not to require us to be rigorous in thinking through the ethical implications for nature. We understand the utilitarian dimension of the problem; loss in biodiversity impairs the capacity of ecosystems to provide services for human benefit. But the cost for humans is the primary issue, not the loss of abundance and variety of life forms (e.g., Worm et al., 2006).

## 8. A new language of conservation

We cannot lessen or alleviate the Crisis of Life without developing or rediscovering a language for assessing the moral components of the destruction of life itself in all its diverse forms. The task ahead is formidable. How do we begin?

### 8.1. Recognize the need to shift the focus

We must reverse the guiding maxim of SD: “What is good for us is good for nature.” There is, obviously, nothing wrong with conserving species for the sake of supporting human needs, but that is not what has happened and it cannot be our primary concern. The values of SD paid lip service to “nature first.” In practice, it reinforced the idea that humans are above other species in their needs and in their rights to fulfill those needs, by using or overrunning nature. The reverse is

unthinkable, quite literally, because we cannot comprehend the nature of the values that would prioritize non-human life forms and allow humans to benefit from the spillover of abundance. We are immersed in a value paradigm that creates resistance to the very idea, like a muscle that seems unstretchable. Changing this not only requires complying with the scientific evidence of dependency of humanity on nature, but forces the conservation community to analyze its concept of nature and clarify the ethical grounds for valuing life.

### 8.2. Recognize that language is essential in shifting the focus

Conservationists must be more conscious of what is being embraced by being practical. Apparently beneficial interventions within the instrumental paradigm may return as costs. Likewise, conservationists must not consider interest in language as a merely academic exercise; language makes possible the values that trigger actions. Some conservationists seem oblivious to the discourse risks (Kronenberg, 2015). We must therefore challenge discourses that do not inspire the kind of radical direct concern that is needed for real moral change. Talk of the intrinsic value of life, for example, does not inspire the necessary changes in human behavior (Maguire and Justus, 2008).

### 8.3. Find a place for science

The most influential component of the environmental movement has tried to bring attention to the Crisis of Life mostly through the language of risk and hazards for human ends, or else through the language that informs with data. A significant part of the conservation movement proceeds as if the crisis situation is not a moral catastrophe, but could be wholly resolved within the technical framework of conservation science (e.g., Mace, 2014). Science confirms extinctions and human induced decrease in abundance by describing events with data. The SD model, however, employs these data to support its value system. Thus, science, which addresses facts, not values, cannot be expected to address the moral implications of the extinction crisis (Raudsepp-Hearne et al., 2010). What is needed is a correlate that accompanies the facts and makes them meaningful to the point of shifting attitudes. That correlate requires a language that we do not have or are not using (Campagna, 2013).

### 8.4. Address the limits of language

We lack both the philosophical basis and the conceptual tools to declare the human-caused extinction of a species immoral, as well as to understand the source of what makes it immoral, beyond vague claims regarding the intrinsic value of life. We suggest that a limit in language has been reached that impedes us from providing moral meaning to the loss of a life form. The species extinction crisis is an example of what the philosopher Cora Diamond (2003), calls the "painfully inexplicable." In everyday language, it is as if facing the extinction of a species, we are at a loss for words. We confront it with minds incapable of comprehending fully what is involved, as do people confronting an unprecedented catastrophe. Therefore, the problem is not the lack of intellectual ingenuity, or dishonesty in expressing a point of view. Rather, it is a problem in the very nature of our thought process, due to having reached a barrier in our capability to think and speak about what we only sense vaguely. It may be that, facing the extinction of a species, we are not just at a loss for words, but stuck in idle mode, incapable of putting language into gear, to borrow a metaphor from Wittgenstein (1958). We need to refashion the language, put it in gear to make it serve this purpose.

## 9. Ordinary language

Do we need an entirely new language? Can we expect a magical solution from academic discourse? We think these unlikely. Rather, we suspect that a more profitable approach is to consider carefully the expressions of respect for life that are already embedded in ordinary language, including the language of non-Western and pre-Christian traditions (Snyder, 1990). In philosophy, we often gloss over and forget ordinary usage, and as a result, we force the logic or grammar of our language in directions that it was not made to go. Conservation, through the auspices of SD, is philosophy gone astray; it shows that we must not simply adopt and extend terms we have received from philosophical traditions, but instead return to the rich and varied sources of understanding in ordinary usage (Wittgenstein, 1958), keeping in mind provenance and semantic drift.

We have referred to Wittgenstein because unlike most other philosophers, including environmental ethicists, he focused on language as a preliminary to any intellectual system building or theorizing (Wittgenstein, 1958). He characterized philosophy as "a battle against the bewitchment of our intelligence by means of our language" (Wittgenstein, 1958). This is an apt description of our battle against the concept of SD and the concept of the intrinsic value of nature. As confusion around both concepts shows, inattention to the bewitching effects of language has profound practical consequences because language has constraints beyond which it becomes unintelligible and useless, or even a source of the illusion of intellectual and ethical progress.

We must also make every effort to study and understand how positive changes in ethical paradigms came about in the past, how they gave new meaning to old terms, or discovered new values through new meanings (think of "genocide" or "holocaust" here, as more recent examples of such breakthroughs in meaning and value). The lesson from SD is that what began with new language ended up as a model for how humanity should relate to nature. Moreover, terrible models for humanity have been overcome in the past. Slavery, chauvinism, and other evils have been overcome (albeit imperfectly) in part by the very concept of humanity, and of human rights, many take for granted now. New discourses were created that turned around entrenched principles of good and bad. They replaced generalized instrumentalist views, such as the economic value of the life of a slave, into a matter of the indisputable and irreplaceable individual rights of freedom. The challenge is to understand the source of moral imperatives regarding non-human species, and to transform our understanding of the moral costs of annihilating the very forms that life adopts.

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