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# De-scenting Extinction:

## *The Promise of De-extinction May Hasten Continuing Extinctions*

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BY CLAUDIO CAMPAGNA, DANIEL GUEVARA, AND BERNARD LE BOEUF

Among the most egregious and discouraging problems of conservation is the rapidly escalating human-caused species extinction rate. “De-extinction” refers to the application of certain cutting-edge techniques for the supposed recovery of lost species<sup>1</sup> and gives the impression that scientists, enlightened and empowered by the miracles of technology, are coming to the rescue. The promise of de-extinction “feels good” because it counteracts the malodorous legacy associated with losing a species. In our view, “de-extinction” is the latest example of a long play of language that has given conservation efforts a tragically false sense of accomplishment and has worsened the conservation crisis. De-extinction is the tip of an intellectual iceberg that sits atop of a host of profoundly questionable value systems, expectations, attitudes, and priorities that elude and bewitch critical reflection. It gives the impression that extinction is reversible<sup>2</sup> and, thus, diminishes the gravity of the human annihilation of species. De-extinction misleads in what it seems to promise. It has more to do with wordplay than reality. Human-induced extinction is real and permanent; the rest is distraction and wishful thinking.

Here, we examine how the language of de-extinction influences attitudes, shapes thoughts and imagination, and creates ethical blindness. Our purpose is to address

the language of de-extinction, not the technical, biological, or practical implications of managing representatives of species that have gone extinct. One might be tempted to dismiss issues of language as mere semantics, but doing so is among the most serious mistakes we conservationists make. Language shapes value systems. It may be intentionally manipulated, as in political propaganda, but it also provides inspiration and justification. It can make offensive practices appear palatable, even justifiable. It determines what is imaginable. In so doing, it establishes the limits of all our efforts to promote conservation. Our point is that it is not a matter of finding better words to communicate or market the goals of conservation. We object to language that plays tricks with the idea of species annihilation and thereby obscures its meaning.

The species extinction crisis is a values crisis, but the values involved in it are obscure because of how the crisis is shaped by language.<sup>3</sup> In our view, the language developing around “de-extinction” reveals what is in fact a profound intellectual crisis at the foundation of conservation. The language masks and distracts us from the essential work of facing up to what we have done, and are doing, to life itself. If we are careful and honest, perhaps a critically restrained conception of de-extinction may be made to play a positive and minor role in the practice of conservation.<sup>4</sup> But the use now emerging is uncritical and confused. The underlying challenge is to find the language that will articulate and inspire the radical and indispensable change needed to come to grips with the value of nature.

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*Conservation needs a breakthrough descriptor similar to what “genocide” signified for human rights. Such a term would help show the perverseness of terms like “de-extinction.”*

### Language and Values

A report from a committee of the International Union for Conservation of Nature defines de-extinction as an “attempt to create some proxy of an extinct species or subspecies . . . through any technique, including methods such as selective backbreeding, somatic cell nuclear transfer (cloning), and genome engineering.”<sup>5</sup> The definition suggests that the scientific community is cautious about the term. The report also declares that the term is misleading and suggests that what de-extinction would create should be referred to as a “proxy”: “a functional equivalent able to restore ecological functions or processes that might have been lost as a result of the extinction of the original species.”<sup>6</sup> In other words, de-extinction would produce “a substitute that would represent in some sense (e.g., phenotypically, behaviorally, ecologically) another entity,”<sup>7</sup> in lieu of the extinct form.

These quotations from a technical report suggest sensitivity to the power of language and send the message that de-extinction is not a concept that enlightens understanding. Nevertheless, the report uses the term “de-extinction” more than forty times, and it is signed by the IUCN’s Species Survival Commission De-extinction Task Force, not by a “proxy species task force.” Even those aware of problematic language resort to its use. Moreover, the word “resurrect,” meaning to restore the dead to life, is used by the task force with a similar lack of concern for its specific meaning. Words and phrases such as “resurrection,” “revival,” or “bringing back to life” are typically used, without scare quotes, in the scientific literature on de-extinction.<sup>6</sup>

There is something incomprehensible, intolerable, and unspeakable about death, so it is understandable that speaking about it is difficult. We understand the death of a human being well enough to mourn it and to value its prevention. We have some understanding of the mass death of individuals, including genocide and such horrors. Species extinction, however, has a different order of significance. It is something with which we have not come to terms because our language and concepts are not constructed for such things. Conservationists discussing de-extinction usually focus on practical matters, on the technological challenges of bringing a lost form of life back into the living world or of reintroducing a species that was lost into its ecological niche.<sup>7</sup> The science and technology are advanced

and sophisticated. In these discussions, however, questions of morality—of obligation, respect, duty, virtue—are not addressed or developed. Even in the context of policy recommendations, the emphasis is on the technological and managerial aspects.<sup>8</sup> When language “goes on holiday,” as Wittgenstein put it,<sup>9</sup> it plays with us and distracts us from the reality we struggle to understand. The language associated with de-extinction serves merely to sugarcoat the loss of life, as though masking the stench of the irreversible loss of life-forms can make that stench go away.

We have a long way to go, ethically, in our relations with humans and other forms of life we care most about. Duties like those that guide our best legal institutions reflect imperatives developed over centuries of rational thought, with concepts and terms that are reasonably well understood. In human relationships, we have arrived at certain principles about freedom and welfare that are widely accepted and indisputable. Such convergence and clarity of thinking are utterly lacking in our evaluation of nonhuman life. Many of us believe, or intuitively feel, that a species extinction rooted in human overexploitation or habitat destruction is a moral tragedy.<sup>10</sup> Because virtually all the value concepts and language we understand best—and rely on as fundamental guides in making judgments of value—are completely tied up with human needs, human welfare, and human rights, we have no way of expressing or accepting indisputable moral imperatives for species loss or other nonhuman areas of ethical concern. We cannot imagine comparing the loss of nonhuman species to acts of genocide in humans—the comparison is terribly offensive to many. Ethically, it seems impossible to begin to explore what species loss means. Indeed, respect for nature and grieving its loss for its own sake have simply not penetrated the wider public discourse to the degree that they should. Aldo Leopold and John Muir, among a few others, took a moral stance in favor of life, but the language they introduced did not achieve wide usage. At least, moral condemnation of mass murdering humans is unequivocal.

Our lack of attention to considering language as evidence for how we refer to, understand, signify, communicate, imagine, and evaluate a conservation problem leaves gaps in our thinking that get filled with audacious metaphors, daring rhetoric, and other enchantments—what Wittgenstein calls “bewitchments” of language and

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Cora Diamond calls “philosophical deflections.”<sup>11</sup> There are many examples of intellectually problematic flights of language in conservation. Terms such as “defaunation,” “restoration,” “remediation,” “reinforcing,” “re-wilding,” “ecological and population enhancement,” “facilitated adaptation,” and “assisted migration” are expressions that convey the many tools we use to try to rescue, via human fixes, what has been destroyed or degraded through other human deeds.

“Re-wilding,” for example, refers to attempts to repair “all past insults” of earlier human interventions in self-regulating communities.<sup>12</sup> But while the concept introduces language in support of human intervention, it does not clarify the hard questions of value that cause the “insult” to wilderness in the first place. It creates a sense of fixing a wrong. Bringing back diversity and ecological functionality are laudable intentions, but “re-wilding” reflects great confusion. The consequences of local or regional extirpations of keystone species are now supposedly to be repaired by reintroducing the species or replacing them with alternatives, artificially engineering a natural state. The greatest impediment to re-wilding, according to Michael Soulé and Reed Noss, “is an unwillingness to imagine it.”<sup>13</sup> But some things should be unimaginable. Perhaps we can engineer a stable ecosystem. We cannot return to the original, co-evolved, self-directing system.

The conservation discourse that has determined the principal direction of conservation efforts for the last three decades is the language of sustainable development. In practice, this means it directs funding and dominates the conceptualization of problems and solutions, macroscale interventions, and the vision followed by governments, as well as many conservation scientists and nongovernmental organizations. Sustainable development is the discourse of “ecosystem services, “natural capital,” “stakeholders,” “offsets,” and “natural resources.”<sup>14</sup> Species are “assets.”<sup>15</sup> The jargon of economics has, thus, expanded to species and habitat conservation. There are critics of this instrumentalist, human-centric paradigm,<sup>16</sup> but decades have passed and it is still the language that dominates public conservation discourse. The mindset is that nature can best be understood and managed through utilitarian principles that benefit humans first and nature only incidentally.<sup>17</sup> Policy decisions are determined by cost-benefit and trade-off analyses. Those analyses tend to favor programs such as carbon-offset markets, in which governments, companies, or local businesses that pollute the oceans and the atmosphere are turned into decent citizens by paying for carbon emissions and helping to finance renewable energy projects. The transaction compensates for contributing to climate change and at the same time allows for compliance with international obligations. It looks like a win-win, but it is illusory. The environmental consequences are bad, and

the core problem—our inadequate moral understanding of what is at stake in an ethical space and logic we have hardly begun to explore—is left unaddressed. All we seem to have on this score is the all-purpose concept of the “intrinsic value” of nature, or the equally elusive “right of species to exist” that speaks to the heart but not to the pocketbook. Sympathizers of the instrumentalist paradigm (the view that nature is for people) argue that people show more enthusiasm for conserving nature when they consider cost-benefit arguments rather than wildlife-centered ones.<sup>18</sup> But maybe this is just because people use and understand clearly only the instrumentalist language of the market; they apply the only value system that seems easy to relate to and understand.

### The Language of Ghosts

The extinct species that we try to bring back occupy landscapes of absence, landscapes that we can see as haunted by “the figure of the ghost . . . which,” as philosopher Jacques Derrida describes, “is neither present nor absent, neither dead nor alive.”<sup>19</sup> Consider, for example, a recent project entitled “Ghost Species: Geographies of Absence and Extinction,” from the University of Cambridge’s Department of Geography.<sup>20</sup> The geographies of absence are the haunting landscapes populated by the lost, the hidden, and the barely there—things that are neither present nor absent, neither dead nor alive. In a silent black and white 1918 film that was made available on the department’s website, we see a ghost species in the form of a strutting and dancing heath hen, a species whose last member vanished in 1932. The footage, rediscovered and released in 2014, brings the bird “back to life.” We see a ghost species when a species is reduced to a last individual living in a zoo or a few individuals barely surviving in a natural habitat.

There are many such “ghosts” in the current extinction crisis. “Defaunation” is a neologism that refers to the loss of animal abundance due to human intervention.<sup>21</sup> The term really should be replaced with “de-wilding,” to incorporate all lost taxa, not just fauna. De-wilding concerns the rare, endangered, and elusive forms of life that populate the landscapes of absence. The IUCN Red List provides a category for some of them: “extinct in the wild.” A taxon listed under this heading is “known only to survive in cultivation, in captivity, or as a naturalized population (or populations) well outside the past range.”<sup>22</sup> At least sixty-nine species listed in the IUCN Red List exist only in zoological or botanic collections, as their natural populations have been annihilated or their habitat destroyed. They play no role in nature, their ecological niche is vacant or occupied by others, and their evolutionary role is like that of a dead language in linguistic history, neither present nor

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absent, close to nonexistent. “De-wilding” also applies to many species that have become so rare that even when they are still found in nature, their existence lacks functional properties. This is the situation for 4,898 species in the Red List’s “critically endangered” category.

Were it not for the category “extinct in the wild,” the number of extinct species recorded in the Red List would increase to 903. If the “critically endangered” are not swiftly rescued, the number of well-recorded extinctions will soon increase to several thousands. What is the purpose of keeping life-forms alive by artificial methods when they are no longer integrated into an ecological web? The stated purpose is to assist them in coming back from the realm of the specter. Fortunately, by a trick of language and effective interventions, we can discard the figure of the ghost and “re-wild” the landscapes of solitude. In fact, there is always the possibility that, by saving the phenotypes, a reintroduction may transmute the ghost into a modestly functional species again. The science and art of species reintroduction are partially encouraging this optimism. There are at least 290 case studies of species that were returned to a landscape of absence. For the last 54 cases known, 65 percent were successful or highly successful,<sup>23</sup> meaning that the efforts resulted in some positive conservation outcomes. But reintroductions are close to being desperado strategies (see the commentary by Rob DeSalle and George Amato in this report),<sup>24</sup> last-ditch efforts to save species from ecological oblivion. Are there even more daring strategies involving ghosts?

Should we rule out desperado approaches, such as assisted reintroductions or de-extinction, because we should never have reached this level of threat? Should we turn to efforts that have a greater hope of success? If we abandon the extinct, should we also abandon the extinct in the wild, or the critically endangered, and instead concentrate on species still abundant and make sure that they will never reach a desperate condition? Or should we work on all fronts or address the most urgent first? If we understood our duties to all life-forms, we might have guidance for such questions. As we do not, we remain uncertain about where to concentrate our efforts.

In this ethical abyss regarding the value of life-forms, language plays an essential role in determining how we address these difficulties. If “de-extinction” is incorporated into everyday language, it will challenge the irrevocability of extinction (see commentaries by DeSalle and Amato, Henry Greely, and Patrice Kohl in this report<sup>25</sup>). If we talk “de-extinction,” with no concern for the effect of this term on values, we are one step into a discourse on resurrection. Offering a positive in place of what was negative, “de-extinction” may deodorize the stench of human-caused extinction to some extent. Supporters of de-extinction and related interventions will strive to speed up the inclusion

of de-extinction in everyday language. The neologisms of conservation are already shifting the language that influences our thinking and practice. As the idea of resurrection is brought down from its metaphysical realm and clothed in the prestigious dress of cutting-edge technology and science, the principles and codes, still so poorly understood, behind extinction will cease to be recognized as morally urgent problems. Talk of resurrection will be interpreted as another heady opportunity for human ingenuity and the miracle of technology, which is always more attractive than the demanding existential effort of protecting and respecting life.

### Extinction and Loss of Life

We tend to think of extinction as the metaphorical “death of a species” (see Kohl’s essay in this report<sup>26</sup>), but “extinction is a different kind of death. It’s bigger.”<sup>27</sup> It is a different kind of death than any of the other deaths we know. It is the death of multiple individuals of the same life-form, even millions of them, over a span of time. Perhaps in this way it might seem like the deaths we know through war and other catastrophes. But when the cause of those mass individual nonhuman deaths can be traced, at least to a great extent, to human overexploitation, then the everyday understanding of “extinction” may not communicate how deep and unspeakable the mass deaths are. Words such as “genocide” or “holocaust” have been coined to express special cases of mass killings and to differentiate them from natural catastrophes or even mass killings in a typical war. To refer to the death of all individuals of a nonhuman life-form, however, we use the same term—“extinction”—no matter what the cause. This is a moral mistake. No moral judgment applies to dinosaur extinctions, but the passenger pigeon extinctions, caused by humans, warrant a judgment. It is a mark of confusion and there is a loss of crucial information, argued Wittgenstein, when we have just one word for a variety of phenomena.<sup>28</sup> The current sixth extinction seems more accurately described as a “super-killing,” whether done intentionally or through willful negligence.<sup>29</sup>

Another reason that “extinction” does not convey the profound and incomprehensible aspect of these deaths is that we do not have a good understanding of the value of life itself, in all its diverse forms, independently of human-centered values. What moral weight do we give to the loss of an insect species compared to the loss of African elephants? How do we weigh the destruction of a South American rainforest? Opinions and intuitive judgments abound, but we have no compelling moral theory to adjudicate such things. At best, we have vague general concepts like “intrinsic value of life”—another blanket term covering a multitude of significant and various ethical phenomena.

Conservation needs a breakthrough descriptor similar to what “genocide” signified for human rights. We need a linguistic analogue, applicable to the rest of nature, for language that connotes mass killings of human beings. Such a term would also help show the perverseness of terms like “de-extinction.” Would the possibility of recreating victims of genocide, through cloning survivors or by creating proxies, make genocide less awful? There is something obviously morally blind in such questions.

### Conservation Values

Scientists and conservationists may have something to gain from pursuing de-extinction, from creating synthetic proxies to occupy the geography of absence. Knowledge might be advanced; scientific and technological progress might be made. Perhaps. But it is not yet clear what is in it for nature and for life in general. De-extinction is supposed to work like a special case of reintroduction.<sup>30</sup> If the goal of de-extinction is to reintroduce a species important to an ecosystem, there may be some positive conservation implications in it. But understanding what de-extinction offers calls for a discussion of the meaning of conservation itself, of the meaning of life-forms and of extinction. This is something the conservation movement, attempting to save species from extinction, has never adequately addressed.<sup>31</sup> The movement has had to choose between a human-centered utilitarian language, with a focus on sustainable development, and the all-purpose language of the intrinsic value of nature, which serves at this point as little more than a vague, schematic label to be filled out more precisely later. The term “de-extinction” is a new tool to promote utilitarian pragmatism.<sup>32</sup>

As de-extinction is yet to be tried, ethical discussion about it is speculative. From our perspective, the ethics will remain speculative even if it works in practice because we will be discussing what is not well thought out, said, or understood with the language at hand. In emphasizing language as an issue of central importance in understanding the moral calamity of species loss, we may sound as if we are engaging more in conversation than in conservation, but we think conversation may actually direct us toward true conservation. We would be better served by marshaling our conservation efforts to prevent extinction in the first place rather than trying to bring a species back from the abyss into a habitat that in many cases no longer exists. Even if that effort were successful, it would do little to address the crisis of global biodiversity decline, habitat destruction, and habitat fragmentation; that is, it would provide little in the way of an effective conservation strategy.

According to Yuval Noah Harari, the scientific revolution gave birth to humanist religions, in which humans replaced gods.<sup>33</sup> In that transition, humans acquired a unique

and sacred essence that is the source of all meaning and authority in the universe, and everything that happens is judged as good or bad depending on its impact on people. The problem is that behaving like gods on the scale that we are doing is a moral mistake that threatens all life. In the Anthropocene, we destroy species because we can, or as Electra announces in the Richard Strauss opera of the same name, “We are god-like, we who do things.”

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