

This essay represents an attempt at dissecting and reconstructing the intuitively appealing idea (to some of us) that evolution is, in some way, an appropriate object of conservation. I stress the importance of distinguishing between the *process* of evolution and the *inputs* to this process as potential objects of conservation (§1), and ultimately motivate the need to focus on the ethical mandate *to respect the autonomy of evolution*, rather than (for example) to protect evolution *per se* (§5) and assess the implications for both of the previous aspects (§6). Along the way, I motivate and defend the idea that evolution is (intrinsically) good (§§2-3), while emphasizing the fact that this normative assumption cannot be taken for granted even among conservation biologists with an interest in evolution (§4).

1. Introduction: Evolution's Building Blocks vs Processes

At the top of [The Rewilding Institute's](#) homepage is a striking quote from founder Dave Foreman: "The most needed and holy work of conservation is to keep whole the building blocks of evolution. Such is the true work of conservation, the goal of those who cannot live without wild things." Its source is "[Wild Things for Their Own Sake](#)," an essay that comes about as close as anything I've read to capturing my own intuitive view on the moral mandate for conservation. Like the strongest passages of *Rewilding North America*, this short essay embodies the ethical perspective behind [my initial attraction to the rewilding movement](#) (even though, incidentally, Foreman doesn't use the word 'rewilding' once in the entire essay).

However, while the essay contains many compelling ideas, it lacks rigor and conceptual clarity from the standpoint of a philosopher (but, then again, what *doesn't* from that perspective?!). Consider, for instance, the quotation above. While superficially inspiring (IMO), it surely oversimplifies. Foreman enjoins us to "keep whole the building blocks of evolution," but *what are* the building blocks of evolution? Genetic diversity? Mutation? Inheritance? Selective pressures? And what, pray tell, does it mean to *keep them whole*? Without answers to these questions, conservationists lack any actionable guidance for their "holy work."

That said, the "building blocks" metaphor is only one of several tropes that Foreman has employed in speaking about evolution as an object of conservation, and part of the purpose of my present essay is to argue that it's *not* the one most important to wilderness protection and rewilding. In fact, even the aforementioned passage contains an elision. In the original text, Foreman continues, "...keep whole the building blocks of evolution *along with* the sweeping landscapes such as Arctic National Wildlife Refuge *where that unforeseeable, unfathomable wonderwork can play out unhindered*" (emphasis added). It's the latter part of this sentence

that closely mirrors my own moral position, that which first endeared me to the original North American rewilding movement: the *process* of evolution should be revered as a human-independent creative force that our late-coming species can't hope to outdo; further, respecting its autonomy and creativity requires us to set aside and protect *space* – space, say, that's sufficient for natural disturbances to shape habitats, for populations of extant species to live without human inference, and for speciation to occur (again and again...).

In “Wild Things for Their Own Sake” and other writings (including *RNA*), it's clear that Foreman *does* consider conservation's “holy work” to consist not only of maintaining the existence of the “building blocks” of evolution – whatever these are – but also protecting *the autonomy of the process itself*. Take, for example, his discussion of the motivation behind the creation of the Arctic National Wildlife Refuge, where he cites founders Lowell Sumner and George Collins as holding that natural processes are “right unto themselves and can evolve naturally without the medium of man” and that the refuge ought to be granted the “freedom to continue, unhindered and forever [...] the particular story of Planet Earth unfolding here [...] where its native creatures can still have the freedom to pursue their future, so distant, so mysterious.” Note, importantly, that Sumner and Collins don't deny that nature can also evolve *with* “the medium of man.” What's important is that evolution doesn't *need* us (duh). Given that evolution *can* and *does* occur autonomously, it makes intuitive sense to think of granting this time-honored process *freedom* to do just that – as will be a recurring theme of this essay.

From the preceding short passage in Foreman's essay, we can distinguish two different dimensions or variables that might be in question when one speaks about conservation's mandate to, in some way, protect evolution:

- (i) The degree/type of human intervention with respect to the inputs to the process (i.e., if you like, the “building blocks”) at some time *t*.
- (ii) The degree/type of human influence on the unfolding of the process over time.

Although Foreman seems to blur the distinction, (i) and (ii) are importantly different concepts. Moreover, while talk of “building blocks” seems oriented toward (i), the intuition that we ought to let evolution “play out unhindered” is a response to (ii): it dictates that we must strive to minimize the degree of human influence on the future course of evolution. However, a non-interventionist answer to (ii) does not necessarily a strictly non-interventionist answer to

(i). Is it ever permissible to modify a landscape prior to leaving evolutionary processes to their “freedom to continue, unhindered and forever”? Should we clean up litter? Remove roads, dams, or other manmade structures? Eradicate invasive species? Replant native vegetation? Reintroduce extirpated species? Proxies of extinct species? “De-extinct” dodos? Novel species that have been genetically engineered to have a better chance of coping with the consequences of climate change? Novel species genetically engineered merely for the sake of throwing some fun new experiments into the mix (e.g., say, glow-in-the-dark fish and transparent frogs)?

I’ll return to these types of questions when I come ‘round to wrap up this essay in §6. For now, suffice it to recognize that when we consider the opportunity to reset the initial conditions upon which evolutionary processes are let alone to act, some types of interventions seem clearly more acceptable than others. What’s most important to note, perhaps, is that even ardent defenders of wilderness often share powerful intuitions that there are many cases in which we *shouldn’t* simply abandon modified and degraded landscapes to the natural course of evolution from here on out. I doubt, for example, that many who share Foreman’s love of wild things would balk at intervening for the sake of removing a dam prior to letting nature be. Nor would many would balk at reintroducing wolves, cougars, or jaguars, for example, to parts of their former ranges from which humans have extirpated them, and which they are unlikely to recolonize without active human assistance. Rewilding supporters, in general, tend to accept restoration to a more natural baseline prior to letting wild nature be. But it’s not an “anything goes” situation. Most defenders of wilderness, I presume, would oppose the release of Glofish into an undammed river for the sake of providing evolution with a greater variety of genetic raw material for its future self-willed experimentation. And there are borderline cases, supported by some but not all wilderness and rewilding proponents – such as the use of proxy species to replace extinct native species. What’s the dividing between acceptable and unacceptable intervention prior to withdrawing our hand? And might it have anything to do with the notion of respect for evolution’s autonomy? I think it does (§6).

In the next two sections, before delving further into these two facets of conservation’s “holy work,” I will step back to motivate the intuition that evolution – specifically, autonomous or “self-willed” evolution as unconstrained by willful human interference – ought to be the object of conservation. This is essential because, in an important sense, “conserving evolution” doesn’t even make sense: evolution will continue to occur regardless, even in areas heavily impacted by human activity, and it will occur even if people intentionally intervene to

manipulate the process (as I discuss further in §5). We should, therefore, resist uncritically accepting Foreman's interpretation – on which protecting evolution implies protecting wilderness – and first reflect more deeply on why evolution is important. Like Foreman, I hold that evolution is intrinsically valuable and commands our wonder, awe, and deference as a natural process which both created and long antedated *Homo sapiens*. However, this is only one of many normative perspectives on evolution seen in conservation biology (§4).

Defending “pro-wilderness” answers to (i) and (ii) requires first motivating the claim that evolution is intrinsically valuable and worthy of respect as an autonomous natural process – for it's ultimately the element of respect or deference to *evolution's own autonomous choices*, rather than a desire to preserve evolution *per se*, that undergirds perspectives like Foreman's.

2. Evolution is Good: The Basic Intuition

Let's start with the basic intuition: whether one chooses to focus on evolution's building blocks or evolutionary processes, the common premise is that *evolution should, in some way, be an object of conservation*. In his well-known article “What is Conservation Biology?” (1985), Michael Soulé enumerates four normative postulates that are shared by most conservationists: diversity of organisms is good; ecological complexity is good; evolution is good; biotic diversity has intrinsic value. He says little to justify the inclusion of the third postulate, which he seems to find obvious enough without further explanation: “Assuming that life itself is good, how can one maintain an ethical neutrality about evolution? Life itself owes its existence and present diversity to the evolutionary process” (p. 731).

Despite my employment in the ethics industry (where theory tends to linger a few centuries behind the insights of conservation biology), I find myself in agreement with Soulé. His argument for the claim that “Evolution is good,” as brief as it is, captures a powerful intuition – one that, at its heart, is shared by not only conservationists but also countless religious believers (for whatever that is worth): if life itself is good (and it is), then *whatever power created life is also good*. Worshippers of God harbored the same basic intuition for centuries before Darwin presented his theory of natural selection, and it's common ground even with present-day Creationists who adamantly deny that an animal died before Adam realized he was naked. Life owes its existence and present diversity to whatever it was that created and

shaped it. That's hardly a novel or radical idea. It just so happens that this creative power wasn't a supernatural deity (sorry... there's no Santa Claus or Tooth Fairy either, btw).

Religions have tended to agree that humans owe reverence and respect to the god(s) who created our world and ourselves. To be sure, these religions are also wrong about many, many things – such as the supposition that it's necessary to posit a supernatural cause of life's origin – but mightn't there be something normatively probative about the root intuition that our Creator deserves our reverence and respect? I suggest that there is. If a person can fail to experience such sentiments while marveling at Earth's life in all its diversity, it would seem that person must be lacking in some of the very qualities that we prize as uniquely human (featherless biped though they may be). Life on Earth is truly astounding in its biological diversity and ecological complexity – and, indeed, in the mere fact that it exists at all. Whatever caused it to come into being is thereby an awe-inspiring force indeed. Yet it is no god or gods but simply the natural process of evolution that is our one true Creator.

To be sure, evolution has – or rather, lacks – certain traits that religions (especially Western monotheistic religions) tend to ascribe to deities who are deemed worthy of reverence. Evolution, for instance, is not omniscient (on the contrary, it doesn't know a damn thing), nor is it omnibenevolent – or even partially benevolent. Evolution doesn't love us or care for us. Of course, evolution is also not malevolent; evolution doesn't have a mind, and so doesn't value us in any way. But does this make the evolutionary process – the shaper of all life in all its wondrous diversity – any less awe-inspiring? I fail to see how it could. Nature's indifference does not abate the wonder that Nature instills in us. On the contrary, the natural world should seem *all the more* marvelous when we acknowledge that the creative processes that crafted it are *nothing like* the creative processes that we enact with our own hands and minds. It defies comprehension. It is ineffable. It commands wonder, awe, and humility. It humbles us, and rightfully compels us to question, “Why assume the human brain could outdo *this*?”

Now, I've never felt the pull of anthropocentric worldviews. On behalf of those who do, however, it is worth emphasizing that we can't be spared the obligation to marvel at evolution on account of whatever special fondness we have for the human kind, for the simple reason that *evolution created us too*. Whatever it is we love about humans – our intellect, our empathy, our language, our abilities to fashion and use tools, our capacity to form societies and transmit culture, our bipedalism, our relative lack of body hair, and so on – *evolution*

created it too. We wouldn't possess our own remarkable abilities were it not for the same self-directed natural processes that also fashioned the rest of life on Earth.

Meanwhile, even the staunchest anthropocentrist must admit that evolution is not teleological. The evolutionary history of life on Earth has not been a goal-directed process destined to terminate in *Homo sapiens*. Foreman also makes this point in "Wild Things":

Darwin saw that evolution has not worked with goals in mind nor has it been overseen or led in any way. Paleontologists, such as the late Stephen Jay Gould, chide our high and mighty gall with the sharp understanding that, therefore, Man is not the unerring outcome or endpoint of hundreds of millions of years of 'life's descent with modification,' but is, rather, a happy or unhappy (hinging on what kind of Earthling you are) happenstance. Belying Gandalf and other wizards and sages, we were not 'meant to be.' [...] We happened to become, just as did deep-sea fish with gleaming flesh-lanterns hanging in front of their nightmare mouths.

It follows that even the staunchest anthropocentrist has no reasonable basis to deny that evolution, left to its devices, could go on to produce other species with capacities as or more impressive as those they admire in humankind. It's pure hubris to decide that evolution should end with us – or, better put, that all future evolution must occur within our thrall – when we could use our incredible evolution-created brains to choose otherwise.

3. Is Evolution Really Good? Objections and Refinements

The proposal that we have a moral mandate to respect evolution will raise some obvious objections (and not only from America's ranks of evolution-deniers). The first is that the proposal is nothing but an obvious case of the naturalistic fallacy, assuming that self-willed evolutionary processes are *good* merely because they are *natural* (§3.1). An overlapping worry is that it's hypocritical to argue that humans should respect self-willed evolutionary processes in wild nature, given that we obviously don't (and won't) in civilization (§3.2). A follow-up is that it would represent a morally problematic type of human exceptionalism to maintain that it's okay for our species to manage evolutionary processes in civilization while denying that it's okay to intervene for the sake of other animals (§3.3). Overcoming these objections might require admitting to a bit of speciesist compromise, but they're meanwhile a good opportunity to dig in our heels on the awe-inspiring nature of the deep-time evolutionary history of life, which renders it self-evident that autonomous evolution is intrinsically valuable.

I might flag one other objection that I won't bother mentioning again: the idea that the conservation of self-willed land is a luxury that humanity can't afford, given that our own species has over 8 billion mouths to feed. I have often seen such statements uttered as knee-jerk reactions to rewilding proposals, but despite the pretense of magnanimity, they rest on a root assumption of human imperialism. Even if it's a long-term project, humanity can *choose* to shrink its footprint and population size in order to *make room* for self-willed land. If there's a moral mandate to preserve autonomous evolution processes for their own sake, we can and must do just that – no excuses. To accept human overshoot as a given is to accept human overshoot as an *entitlement*, for it's within our capacities to choose to reverse it.

3.1 The Naturalistic Fallacy

G.E. Moore introduced the term 'naturalistic fallacy' to refer to the philosophical mistake (in his view) of concluding a normative claim (e.g. "smoking pot is good") from a claim about something's natural properties (e.g. "smoking pot is pleasant"). (I don't think this was Moore's exact motivating example, although he *did* make the general point that "X is good" doesn't follow from "X is pleasant," if memory serves.) Today, the term 'naturalistic fallacy' is used colloquially to refer to the fallacy of concluding that something is good or acceptable simply because it occurs in nature (e.g. "eating meat is morally acceptable, because humans are animals, and it's only natural for animals to eat other animals"). Interestingly, though, Moore himself conceived of the naturalistic fallacy much more broadly, even using it to argue against "divine command" theories of morality (e.g. "adultery is wrong because God declared that adultery is wrong"). For Moore, the important take-away was that the normative claims cannot be derived from descriptive ones; statements about *what ought to be* can't be derived from statements about *what is* (whether natural or supernatural). On his account of ethics, moral properties are unique and irreducible. If this all sounds tangential to the topic of the normative foundations of conservation, that's because it is – and that's one reason I don't think the naturalistic fallacy is a real worry for the Soulé/Foreman position.

The claim that evolution is good – or, all the more, the claim that evolution is good *as it occurs on its own, unhindered by the actions of humans* – might seem to smack of the naturalistic fallacy, since it seems to assume that something possesses the moral property of goodness simply because it's natural. Indeed, Foreman effectively asserts as much, stating that wild things are good in virtue of being wild: "... wild things, which are Earthlings that are as yet

self-willed and not thralls to Man. These other Earthlings are good because they are and because they are free by being wild. Wild things are good-in-themselves” (emphasis added). For Foreman, Nature’s freedom from Man’s will is intrinsically good, a truth he seems to accept as axiomatic. This includes, perhaps more paradigmatically, the process of evolution: “Evolution embodies wild things being for their own sakes. Evolution is good-in-itself.”

I maintain that, in fact, that this is *not* an instance of the naturalistic fallacy. First, it doesn’t commit the naturalistic fallacy as defined by Moore, because Foreman is making a claim about self-willed nature and evolution, not attempting to define what makes something good (§3.1.1). Moreover, I deny that Foreman (or Soulé) commits the naturalistic fallacy even in its colloquial sense, simply because there’s no argument from a premise “X is natural.” As I presented in our first pass in §2, the claim that “evolution is good” is the conclusion of a different argument, which doesn’t contain such a premise (§3.1.2). More importantly, though, I conjecture that the moral belief that “self-willed evolution is intrinsically good” needn’t be, and sometimes is not, the conclusion of *any rational argument at all*. Instead, for many or most lovers of wild things, it’s merely something intuitively obvious, a bedrock proposition, once our sentiments are attuned to the wonder of life on Earth and its natural history (§3.1.3).

3.1.1 What’s Good vs What’s Goodness

I don’t know whether Foreman was a moral naturalist or non-naturalist in the Moorean sense, but this seems to be an orthogonal issue – and one about which, TBH, the vast majority of conservationists would rightfully give zero f***s. If we like, we might imagine Foreman saying this: “Self-willed evolution is good, and by the way, goodness itself is an irreducible, *sui generis* property; self-willed evolution merely happens to be something that possesses it.” Well, actually, I find it hard to imagine Uncle Dave saying that, but if he did, he’d seem to accept Moore’s view of moral properties. Likewise, in saying “Evolution is good,” Soulé is merely ascribing goodness to evolution. Neither Foreman nor Soulé attempts to make a claim about what goodness itself consists in – and it’s unclear why in f***’s sake a conservationist should ever need to engage in moral theory at *that* level of abstraction, however important it is that conservation be morally grounded.

In other words, Foreman and Soulé are willing to accept the concept of “goodness” as something that people will intuitively understand. This, to me, seems reasonable. Just as a social scientist can study human behavior without providing an account of physiology, a

conservation biologist can delineate the moral foundations of their discipline without providing a metaethical theory on the nature of the good. They assert that certain natural things *are* good, but they never attempt to define goodness in terms of natural properties, since it's unnecessary for them to go to the bother of defining goodness at all. Thus, any accusations of the Moorean naturalistic fallacy are non-starters.

3.1.2 “The bringer of goodness is thereby also good.”

To be sure, most people who talk about the “naturalistic fallacy” these days *don't* mean the term in the sense originally used by Moore. They mean, roughly, that it's fallacious to assume that X is good on the grounds that X occurs or happens in nature. Although this appears more threatening to the positions of Soulé and Foreman, I maintain that it also misses the mark.

In §2, following Soulé, I accepted the premise that whatever in fact caused life to exist and diversify is *ipso facto* good. This might seem to derive a claim about moral properties from a mere empirical fact, exactly what Moore advised us not to do. However, this claim is not a brute assertion but the consequence of an argument:

- P1. The existence of life is good.
- P2. What brings goodness into being is thereby also good.
- C. Therefore, whatever in fact caused life to exist is itself good.

This argument makes assumptions about the logical or conceptual relations between good things. However, it does not rest upon any specific definition of ‘good’. Moreover, it does not require the latter to be a valid argument (as long as there's no equivocation on the meaning).

Now, for any philosopher – even G.E. Moore – moral theorizing has to hit bedrock *somewhere*, usually with unshakeable brute intuitions about what's good and bad. Most people, presumably, would agree that the existence of complex life is good. As Foreman also writes, “If there is good-in-itself at all, I would think ‘life is good’ would be self-evident or unmistakable.” This is true even for those who aren't biocentrists or ecocentrists, since life is kinda a prerequisite for other things that even anthropocentrists think of as intrinsically good, things like health, love, friendship, or appreciation of beauty. Thus, P1 seems like little more than a basic postulate in an inventory of things that are obviously good.

The action, presumably, will be with P2 – the elided premise in Soulé’s brief argument. Admittedly, P2 isn’t obviously true, and it possesses the fatal flaw of lending itself to apparent counterexamples involving references to Hitler (e.g. “Let us suppose that some of Hitler’s paintings were in fact good; does this thereby entail that Hitler was good?”). Mightn’t something cause good to exist – perhaps even accidentally – without being good itself? There are significant concerns with P2, but they’re not the naturalistic fallacy.

I happen to think, however, that the more promising approach is one that doesn’t require us to defend the truth of P2 at all. As an alternative, given that moral theorizing must hit bedrock somewhere, we might consider the idea that the postulate “(self-willed) evolution is good” is *itself* moral bedrock. In this case, there is no further need to “prove” that evolution is good by appealing to the goodness of the life that it has created. So let’s go there...

3.1.3 “Self-willed evolution is good, period.”

As an observation, I’ve encountered no defender of wilderness who concluded that “wilderness is good” on the basis of a logical deduction from the premise that “what is natural is good.” On the contrary, most fervent advocates of the intrinsic value of wilderness are people who have *directly experienced wilderness areas* and come away indelibly impressed by their undeniable beauty, wonder, and magnificence. For many wilderness advocates, the proposition that “self-willed nature is intrinsically good” might be said to have roughly the status of a revealed moral truth. It is not, in any case, the conclusion of a deductive argument; it’s a truth that nature impresses upon a person directly, and one that can seem as entrenched and unshakeable as propositions like “health is intrinsically good,” “love is intrinsically good,” or “friendship is intrinsically good.” As mentioned above, moral theorizing has to hit bedrock somewhere – and I posit that the inherent goodness of self-willed nature is itself moral bedrock. Further, I hypothesize that the fact that many or most moral philosophers ignore this is due to demographic bias: most moral philosophers, like most people, are estranged from experiencing or even thinking about wild nature. When wild nature is just something “out there” – or something that used to be out there, but which humans have already vanquished from Earth – it’s easier to ignore, forget about, or conceptualize in merely instrumental terms.

(I realize that it may be an unpopular move dialectically to accuse other philosophers of moral ignorance due to estrangement from important lived experiences. Nonetheless, I think it true.)

Although direct experiences of self-willed nature might be the most common route to recognition of its intrinsic value, I believe this recognition and respect can also result from indirect means, such as imaginative and mindful engagement with the natural sciences. For my own part (as someone who, confessedly, has never set foot in a designated wilderness area), it simply always seems to be the default position to see the natural and unguided unfolding of evolution as something inherently good. For me, this is likely the consequence of decades of casual fascination with palaeontology and the deep-time history of life on Earth. Even as an urban-dwelling adult “professional,” I’ve often sauntered along sidewalks in the thoroughly humanized landscape of Columbus, Ohio while distracting myself with fantasies of the landscape during its prehistory as a warm Devonian sea, teeming with reefs of corals and crinoids, a few placoderms swimming by... so unlike the Holocene, so unlike even the Silurian or the Carboniferous. How can one imaginatively reflect on the long history of life on Earth *without* perceiving intrinsic value in evolutionary processes that are (as Foreman puts it) “free to unfold for wild things in its own unhobbled, eerie way”? But then again, most moral philosophers also don’t spend a significant amount of time contemplating palaeontology...

The upshot is simply this: it’s possible to cultivate a mindset in which “(self-willed) evolution is good” has as much claim to the status of a self-evident “bedrock proposition” as “life is good,” an mindset of deep enchantment and wonder at life’s natural history. Moreover, once one attains this mindset, it’s hard to unsee the intrinsic value of naturally unraveling evolutionary processes. There does seem to be value added to our fascination with the diversity of life on Earth – and even the mysteries of our own species and its wondrous capacities – when we reflect not only on life as it is *but also* on the billions of years of arational and unguided processes that created it. I submit that it’s hard not to instinctively see the evolutionary history of life as the source of additional wonder (if this isn’t obvious, perhaps try asking a dinosaur-clutching child?); it is more than an instrumentally valuable tool for the creation of intrinsically valuable life. For my own part (and I know that I am not alone in this view), I find that knowledge that life is the product of blind and impersonal natural processes generates much mystery and enchantment in the more-than-human world than acceptance of the false belief that life was created in its present state by an intelligent and anthropomorphic god.

Importantly, the claim here is not that evolution is valuable *because* it’s a source of wonder and enchantment to humans. My suggestion is that we should accept sentiments like wonder, enchantment, and awe as morally probative sentiments, just like love and empathy (or perhaps, on the negative side, shame or indignation). If knowledge and contemplation of the

deep-time evolutionary history of life tends to arouse such sentiments in those who are both mindful and informed, then that is evidence that the natural unfolding of evolution is intrinsically valuable – and thereby worth protecting for its own sake.

My suggestions above are paralleled, I believe, by the arguments implicit in “Wild Things for Their Own Sake.” Following Leopold, Foreman identifies conservationists as “those who cannot live without wild things.” Such a personal love and need for wild things, as he says, “is bedrock” – bedrock, as I would suggest, upon which to build a moral theory. But Foreman is meanwhile clear enough that wild things are good *for their own sake* (I mean, hell, it’s the friggin’ title). They aren’t good (only) *because* they bring pleasure and enchantment to our lives as humans. On the contrary, it’s our deep and immutable love of wild things that makes it impossible to deny that wild things are *good in themselves*. We might say much the same about the undeniable intrinsic value of a *person* for whom we feel a great love: we don’t consider our loved ones to be valuable *because* they engender pleasant feelings in us; much to the contrary, our feelings toward our loved ones reveal to us plainly and without question that they are intrinsically valuable beings. Foreman is not explicitly a moral sentimentalist, but one can read him here as endorsing a morally probative role of the sentiments – as I suggest.

And what, again, does this long and rambling sub-subsection have to do with the naturalistic fallacy? Recall that in colloquial understanding, the naturalistic fallacy is to infer “X is good (or X is acceptable)” from “X is natural.” It can be exemplified by perverse reasoning such as concluding that rape is acceptable from the premise that forced copulation is a natural mating strategy among many non-human animals, or that it’s okay from a child to push her sibling from a tree into crocodile-infested water, because it’s merely a natural behavior (as seen in, e.g., egret chicks). But as articulated above, the claim that evolution is good is *not* the consequence of an argument from an implicit premise referring to its naturalness – for it’s not the consequence of an argument *at all*, but a truth directly revealed by intuition. (And as for the fact that it’s *not* intuitive to many people, I’ve suggested that that’s merely because many people are estranged from nature and even from the imaginative contemplation thereof.)

3.2 Human Hypocrisy?

Let’s now turn to another objection, ostensibly more damning than mere accusation of the naturalistic fallacy: as a matter of fact, leaving evolution to its own devices results in states of affairs that are obviously *bad*, such as disease outbreaks, mass starvation, or being attacked

and eaten by predators. Moreover, not only are these states of affairs ones that are intuitively bad, they're ones that can be *prevented* – and replaced by states of affairs that are clearly *better* – through deliberate human intervention in the natural course of evolution.

Virtually every human alive – the author included – is disposed to agree that it's morally permissible, even morally mandatory, for humans to take *our own* evolutionary destiny into our own hands. For example, we use vaccines and other medicines to treat or (ideally) eradicate diseases, for example, rather than permitting viruses and bacteria to run their course, allowing natural selection to gradually skew the human gene pool to genotypes better able to survive the diseases they cause (at least 'til reproductive age). We severely nearsighted humans wear corrective lenses, when otherwise an early accidental death might have prevented our transmitting the relevant genes to another generation. Rather than letting the slowest and weakest among fall prey to large carnivores who fail to perceive the sanctity in our bodily meatsacks, we avail ourselves of technologies to obliterate natural predators *en masse*. And so forth. Nearly all of us accept that, to some extent, our technologically enabled self-protection against natural threats as our *right*, even our mandate for the sake of our communities and societies. This proves, it seems, that we believe not only that we can outdo natural evolution with our own ingenuity but also that we are *morally right* in doing so.

Isn't it hypocritical for the author, for one, to call upon people to revere natural evolutionary processes at the same time as partaking of the advantages and protections afforded by human technology and civilization? I am, after all, quadruple-vaccinated against COVID-19, and in matters of public health I've remained staunchly anti-anti-vaxx. If I were true to my stated principles, should I not want to allow unguided evolutionary processes to sort out the human response to COVID-19 and other infectious diseases?

We might pause here to note what this objection is not: it's *not* the concern that acceptance of the “goodness” of evolution will lead to “Social Darwinism” and hence morally egregious policies such as eugenics. Eugenics, after all, is deliberate human intervention in the composition of the human gene pool – *anything but* leaving self-willed evolution to its own devices. Nor does veneration of natural evolution seem to entail that societies should choose laissez-faire capitalism over a welfare state; economics seems like something entirely orthogonal here. Social Darwinism, as typically construed, has little to do with biological Darwinism – and I'm talking here about biological Darwinism. Yet, as we've seen, the latter alone is sufficient to raise serious moral concerns in the context of human society.

I actually think the hypocrisy objection has some teeth, to be sharpened in §3.3, but an initial response is to say that it misses the target entirely – for it was never the proposal of Soulé, Foreman, me, or any other conservation biologist (to my awareness) that self-willed evolution must be allowed to run its course over the *entire world*, human civilization included. On the surface, at least, there's no incompatibility between controlling the unwanted action of natural evolutionary processes within the scope of human society (e.g. vaccinating against infectious diseases) at the same time as preventing the sprawl of human society, setting aside wild places specifically to safeguard the natural flow of evolution. It may be something of a compromise position, but it seems nonetheless internally consistent, to declare something like the following: “We accept it as our evolution-given right to use our know-how to the best of our ability to advance our wellbeing as a species. At the same time, however, we acknowledge that we are not evolution's be-all and end-all, and thus we also choose to protect areas of the Earth sufficient for natural evolutionary processes to exercise their own creative powers in shaping future life, unguided and unassisted by us.”

This is, it seems, precisely Foreman's view. Clearly, Foreman maintains that human societies need to exercise restraint in order to save space for “self-willed” evolutionary processes to transpire: “Man must show restraint [...] by leaving some lands and wildlife alone, by not stamping our will on them,” and “we must step back somewhere (many somewheres) so evolution is free to unfold for wild things in its own unhobbled, eerie way.” Meanwhile, however, he never suggests that humanity must submit *itself* to governance by these processes. It is a way, perhaps, to have our cake and eat it: we can take advantage of our unique abilities to improve the lot of our kind through medicine and other technologies, as long as we limit the expansion of our civilization and retain areas of wilderness, where wild things can “follow their own path as cobbled out by evolution, ecology, and happenstance.”

3.3 Human Exceptionalism?

The compromise position suggested in §3.2 is alluring to me, as it likely is to any other wilderness advocate reading this on a beloved technological device. However, given that many of us also adamantly deny human exceptionalism, worries about hypocrisy linger.

Here is the next in the line of worries: if deliberate interference with evolution is better for humans, then why should it not also be better for non-human animals? Is there any reason not

to assume that, like us, many non-human animals would prefer the protection, security, and comfort of domestication? We associate wildness with freedom, but what if wild animals, given the choice, would happily trade that freedom for goods like food, protection, and antibiotics? Many humans, after all, prefer a life of office work to a life of bushcraft, despite the numerous artificial constraints imposed by the former. Is it morally wrong to allow sentient non-human animals to remain mere pawns in the ongoing saga of evolution – fraught as it is with disease, predation, scarcity, exposure to the elements, and other hardships – when we could impose our civilized technologies upon them too? (“What have the humans ever done for us...?”)

Some philosophers have argued that we *should*, in fact, protect non-human animals from such natural hardships like starvation, disease, and predation – to the groans and incredulous stares of those who can’t live without wild things. See, for example, the [literary inspiration](#) behind a group of animal rights activists and transhumanist crackpots [on a mission](#) to “safely transform carnivorous species into herbivorous ones,” or Martha Nussbaum’s latest book *Justice for Animals* (Chapter 10) and the associated article [“A Peopled Wilderness”](#) (*The New York Review*). Reading the work of Nussbaum or Jeff McMahan, suffused as it is by an utter indifference to the wonders of ecology and evolution, I can’t help but feel embarrassed for my own discipline (but recall my accusations made against the majority of philosophers in §3.1.3). Nussbaum embeds her argument in a purported takedown of the concept of the “wild” that is frankly too atrocious to waste time diagnosing its flaws. In any case, it would be unnecessary to do so, since the welfarist positions of Nussbaum and McMahan seem to lead to radically interventionist conclusions even without Nussbaum’s assumptions that humans irrevocably control all of the Earth and the idea of the “wild” is a mere human-contrived fantasy: if self-willed nature does exist, the Nussbaum/McMahan position entails that we should put an end to that, for (formerly) wild animals’ own health and welfare. Nussbaum notes that “For millennia, Nature has meant hunger, excruciating pain, often the extinction of entire groups,” and denies that self-willed nature offers “useful guidance” for normative thinking (*JfA*, p. 227). Instead, she enjoins us to “use our knowledge – wisely and deliberately – to protect wild animal lives” from natural dangers and hardships (p. 235). The fact that Nussbaum is thinking on the order of “millennia” should tell us something about her grasp on evolutionary history.

To the lover of nature, as opposed to the animal lover, proposals like “herbivorizing predators” are viscerally appalling. Nevertheless, I do believe that the *tu quoque* objection has some force: we humans think we’re good enough to use our technologies to protect *ourselves* from natural disease, scarcity, and predation, and even the majority of wilderness advocates don’t

plan to give this up (as granted in §3.2); why, then, should we deprive other sentient animals of the same benefits of our know-how? We might offer up the line that only humans can express *consent* to relinquishing our “wildness” for safety and security. However, those persuaded by Nussbaum’s conception of justice for animals would doubtlessly insist that we don’t even need to ask: we can reasonably assume consent when the alternative is an early and painful death. On the other hand, perhaps the assumption is unwarranted. After all, a few humans *do* choose backwoods survivalism – or would if they could – and resent civilization. We don’t know *for sure* without asking, and non-human animals don’t speak our language.

Intuitively, however, there should be no reason to worry about whether or not non-human animals would consent to a full-fledged taming of the wild “for wild things’ own good” – for, intuitively, this Nussbaum/McMahan-inspired line is ludicrous and dead wrong. Instead of a viable competing perspective, it’s the sort of counterintuitive consequence that one puts forth as a *reductio ad absurdum* of ideas like “compassionate conversation,” as [I instinctively did](#) after my friend Mark Fisher altered me to the existence of herbivorizepredators.org. It’s been my position that rewilding advocates shouldn’t forefront the wellbeing of individual animals, precisely because it has such ludicrous entailments that run afoul of our commitment to the protection of self-willed evolutionary processes (e.g. I have put forth this view in response to a recent column by William Lynn, as [here on Twitter](#)). Yet merely saying this is question-begging: why should we protect self-willed evolutionary processes when doing so leads to preventable individual suffering? After all, it’s not what we’ve chosen for our own species, and most of us believe that it would be *morally wrong* to choose it for human societies.

It would demand a separate article to address the tension and controversy between ethical theories focused on the wellbeing of individual animals and the ecological holism of ecocentric ethics, including Foreman’s/my evolution-first perspective. However, as I reflect on my own intuitions, the truths I just can’t shake include the following: (a) predation and other causes of individual pain and suffering have been natural facts of the history of life since at least the Cambrian; (b) these dangers to individuals were also selective forces that propelled evolution for the past 500+ million years; (c) without this evolutionary history, Earth would never have produced creatures with the “Capabilities” that Nussbaum holds so dear, nor creatures with capable of inventing modern medicine and willfully domesticating the wild; (d) the latter creatures *only happened to be* (as Foreman put it); (e) if humans had not evolved, there’d’ve simply been no question that evolution would continue on its own unhobbled path, along with all its concomitant pain and suffering; (f) we don’t know what novel lifeforms

autonomous evolutionary processes would (and still could) produce without deliberate human intervention, but if we think that *we're* worth the hundreds of millions of years of suffering that antedated *our* evolution, then who's to say that these possible future species wouldn't be worth the suffering that a Nussbaum would have us prevent? I simply find it impossible to rationalize longer lives and more peaceful deaths for any number of individual animals as an acceptable trade-off for the premature curtailing of the uncertain unfolding of future evolution.

4. Reasons to Conserve “Evolutionary Potential”

For the remainder of this piece, let's accept the common intuition that animal-rights positions like those of Nussbaum are wackadoodle (to adopt a technical term from Jack Humphrey, p.c.) and that evolution ought to be left to continue as a natural phenomenon without attempting to force it to conform to human ideals of justice. This still leaves much room for foundational normative disagreement between conservation biologists, and these underlying differences in value can profoundly influence one's views about the appropriate means to “conserve evolution” in practice. Differences are especially stark with respect to questions concerning the degree and type of deliberate human intervention that is acceptable.

According to the position expounded above, evolution and its natural creativity – unaided by us – is a bearer of intrinsic value. Foreman, following Soulé and Leopold before him, further argues that this implies a need for the protection of wilderness areas. Before looking in more detail at the practical implications of the “evolution is good” postulate (i.e. under what circumstances it *actually* entails wilderness conservation), it's important to stress that this position does *not* represent the only normative basis upon which conservation biologists have argued for the importance of evolution as an object of conservation. Most notably, it's possible to believe that evolutionary processes are important without believing that their value is *intrinsic*. Indeed, it's possible to believe that evolutionary processes are important *due to their ultimate instrumental value for people*, or even due to their instrumental value in preserving human-valued biodiversity *in the face of human impact*.

It is not my goal, of course, to suggest that we ought to “let a hundred flowers bloom” with respect to schools of thought on the moral basis for protecting evolutionary processes or evolution's “building blocks.” Of course I support free speech and open debate. But I also support having some backbone and defending the position that one believes to be true,

especially when (as in the case at hand) divergent normative frameworks lead to prescriptions for action that are often diametrically opposed. It's important to acknowledge competing perspectives on the value of evolution, because it's imperative for wilderness advocates to learn that they can't rest content with parroting Soulé's axiom that "evolution is good," sharing the Foreman quotation on the rewilding.org frontpage, or echoing Leopold's statement that wilderness is the theater of evolution. Statements such as "evolution is good" oversimplify, and they ignore the fact that conservationists with highly contrary opinions could say the same things. Furthermore, divergent normative frameworks also permit extremely different practical interpretations of the mandate to "keep whole evolution's building blocks" (cf. §5.2).

An article published in 2020 in *Evolutionary Applications* is very useful in illustrating the myriad perspectives that conservation biologists bring to the table when discussing (or presupposing) the importance of evolution (Emmanuel Milot, Arnaud Béchet and Virginie Maris, "[The dimensions of evolutionary potential in biological conservation](#)"). Milot, Béchet and Maris (MB&M) usefully showcase the fact that "conserving evolutionary potential" can be interpreted as something very human-centric, in both its motivations and its execution.

First, though, I want to note that even Soulé doesn't necessarily take the strong approach of proposing that evolution itself is something *intrinsically* good, as opposed to *instrumentally* good insofar as it generates biodiversity (or life itself; cf. the argument reconstruction in §3.1.2). Soulé makes a point of specifying that *biotic diversity* is intrinsically good (Postulate 4), which he does not in the case of evolution. If this is indeed Soulé's position on the relative value of evolution and biodiversity, it seems bass-ackwards. As I've noted in various past writings, biodiversity does not always appear to be good *ipso facto*; instead, greater diversity seems good *only insofar as it's the result of natural processes*. For example, releasing lab-created chimeras (or non-native species) into wild nature might indeed increase regional biodiversity. However, this seems to subtract rather than add value to the landscape; it is pollution, not enhancement. On the flip side, the extinction events of prehistory, including mass extinctions, were simply part of natural unfolding of life's long history, opening new niches for adaptive radiation and novel evolutionary experiments. The present biodiversity crisis is bad, but the fundamental ill is not biodiversity loss *per se* but its cause: human overshoot and the accompanying destruction of natural ecosystems and self-willed natural processes.

I might devote a future essay specifically to the case for an "evolution-first" instead of "biodiversity-first" ecological ethic. It might appear to split hairs between different types of

ecocentrism, but there are real differences in practical implications. Presently, however, I will defer further discussion and turn to the point that the conservation of evolutionary potential – to refer to the concept of MB&M’s focus – needn’t even be ecocentric in its motivations. Indeed, some conservationists propose the same objective for anthropocentric reasons.

“[Dimensions of evolutionary potential...](#)” is a worthwhile read for any conservationist attracted to the normative positions of Foreman and/or Soulé, largely because it provides a reminder that evolution-focused conservation implies neither ecocentrism nor wilderness conservation. Indeed, while MB&M *do* mention the idea of a “non-anthropocentric, *process-centred*, normative commitment to preserve evolution as a process in itself,” they give little attention to the view, which they present this view as an outlying perspective: “while [the conservation of evolutionary potential] is viewed as a *means* in the vast majority of instances, there is also a tendency by some to consider it as an *end* in itself, without any explicit qualification of the normative goal it is supposed to contribute to” (p. 1365; emphasis in original).

Because they swiftly pass over the aforementioned “process-centered commitment,” many of the details of MB&M’s article are orthogonal to the present discussion – given that it’s precisely this neglected perspective that I consider to be the necessary core of an ethic for rewilding and wilderness conservation. Nonetheless, it is well worth paying attention to the disparate normative frameworks that can underlie the demand to conserve the vehicles of evolutionary potential, as this highlights some of the problems with Foreman’s “building blocks” rhetoric. Granted, it’s not quite clear whether MB&M’s “vehicles of evolutionary potential” are the same as Foreman’s “building blocks of evolution,” since Uncle Dave leaves the latter undefined. MB&M, in contrast, do provide an operational definition for “evolutionary potential,” this being “the property of a biological entity (e.g. genome, trait, population, species, ecosystem) to be able to experience heritable change in some of its components between times t and $t + \Delta t$.” As this schematic definition makes plain, there are multiple variables that need to be defined before proposing any type of actionable plan for the conservation of evolutionary potential, including the relevant type of biological entity and the appropriate timespan. There’s no need to get into the weeds here. What merits emphasis is simply the range of normative frameworks that MB&M identify as compatible with the conservation of evolutionary potential (and thus, presumably, the building blocks of evolution).

Following Soulé 1985, one possible position noted by MB&M is that evolutionary potential is instrumentally valuable as a means to promote future biodiversity, where biodiversity is

intrinsically good. But this is far from the only option. For example, the generation of biodiversity might be accepted as a proximate goal, but the ultimate goal might be the provision of ecosystem services for humans via this biodiversity. MB&M summarize this type anthropocentric thinking on the value of evolution:

Within the context of global environmental changes, the evolutionary potential of ecosystems to adapt to new environmental conditions could be a key feature to maintain or enhance the provision of ecosystem services [...]. Furthermore, the evolutionary process itself may provide benefits to humans, coined “ecosystem services”; some authors go as far as to metaphorically qualify the evolutionary process a “factory for human uses” [...], for instance when a native species evolves rapidly to predate a harmful exotic species” (p. 1374).

Another perspective considered by MB&M has it that evolutionary potential is important not necessarily to promote the future diversification of life, but to allow existing biological lineages to adapt in the face of climate change and other anthropogenic modifications of the Earth (see their discussion of “process” and “pattern” on p. 1364). Here again, the protected biodiversity may be deemed valuable either intrinsically or instrumentally. It might be considered valuable to humans, whether for further practical reasons or simply for the “preservation of contemporary species of human interest” (see Box 3, p. 1366). MB&M also entertain the possibility of conceiving of the conservation of evolutionary potential as something useful to *individual animals* (i.e. the accursed “compassionate conservation” perspective we touched on in §3.3). Here, one might conjecture that “for individuals confronted to changing environments, being able to express adaptive traits is beneficial if it means less stress or suffering for them” (p. 1374) or, alternatively put, that evolutionary potential might be “a vital asset to allow the survival and welfare of the individual members of these [animal] populations” in the face of rapid environmental changes (Box 3, p. 1366).

In sum, a commitment to conserving evolutionary potential doesn't by itself imply an ecocentric moral framework, much less commitment to the autonomy of natural processes as an end-in-itself. A focus on evolutionary potential could follow from animal-welfarism or, much more commonly, anthropocentrism. In part because of this disparity in underlying normative frameworks, the conservation of evolutionary potential *also* does not automatically imply the conservation of *wilderness*, i.e., self-willed land. MB&M make a similar point themselves:

Many will agree that the free evolution of two lineages after a continental drift is more “natural” than the directed evolution of adapted varieties of crops. The normative intuition motivating [conservation of evolutionary potential] will not be the same depending on whether we target/accept “natural” evolution, “artificial” evolution, or both, and likewise for natural versus human-created evolutionary potential. [...]

[W]hen [conservation of evolutionary potential] is justified on an anthropocentric basis, the level of human influence interferes less with conservation values. What matters is the capacity of ecosystems to deliver services [...], regardless of whether it happens naturally or not. Things get more complicated when [conservation of evolutionary potential] is based on nonanthropocentric values for which the level of human intervention may be decisive (p. 1375).

MB&M are well aware that non-anthropocentric moral commitments can lead to intrinsic objections to human interference with evolution. However, this issue receives scant attention until the penultimate section of the article. As a result, conservationists who place normative importance on *wildness* might spend much time scratching their heads on a first read, due to what at first seems like obliviousness to the possible relevance of whether certain adaptations are human-caused. Consider, for example, MB&M’s warbler case: two delightful New World Warbler species, the Blue-Winged Warbler (*Vermivora cyanoptera*) and Golden-Winged Warbler (*Vermivora chrysoptera*), have begun to hybridize at much greater-than-natural rates as a result of deforestation, which caused their previously isolated ranges to overlap. As it turns out, “females of both species prefer golden-winged mates, causing the disappearance of pure golden-winged phenotypes after a few decades of contact in a given area” (p. 1367). MB&M consider multiple interpretations of this case study, including the suggestion that it “could be seen as the expression of the evolutionary potential of the blue-/golden-winged system taken as a whole, thereby responding to human-induced environmental change” and arguably even a means of “maintaining biodiversity, perhaps not under the form of two separate species but as a merged one adapting to its new environment” (p. 1368). The authors nearly reach the end of the article before pointing out that “Hybridization seems to be more tolerated by conservationists when humans are not responsible for it” (p. 1374). The general point is simply this: if it takes MB&M *this long* to consider the possibility that human interference (or lack thereof) is a morally relevant factor, then there must be widespread views in conservation that hold that it *isn’t*, while nonetheless focusing on “evolution potential.”

Many other examples in MB&M’s article are equally illustrative. In their Table 1 (p. 1370-1), they delineate an array of possible proposals for the conservation of evolution potential, chosen to

exemplify the wide variety of goals and actions that might fall under this heading. Some of the proposals wear their tolerance for human intervention on their sleeve. One, for example, addresses the specific target of “maintain[ing] diversified communities in human-altered landscapes,” entirely setting aside the critical topic of the conservation of landscapes that *aren't* human-altered. Another glaringly anthropocentric target is “maintain[ing] a provisioning service in forestry (timber production).” Meanwhile, the proposals encompass actions that demand a high degree of direct and deliberate human influence on the evolutionary process, such as “assisted migration of tree species adapted to warmer climates.”

Later, they introduce the proposal of [prescriptive evolution](#), “defined as the ‘use of planned manipulations of evolutionary processes to achieve conservation outcomes,’” such as “favour[ing] individuals with (genetic values for) phenotypes that are expected to be better adapted to changing environments” (p. 1375). As Smith et al describe the cited proposal, prescriptive evolution also encompasses such strategies as introducing genes “from suitable sources” into populations with low genetic diversity to prevent adverse fitness consequences of inbreeding, artificially proliferating genes of “invader-experienced” plants to promote the ability of native species to withstand biological invasions, or genetically monitoring species threatened by disease to promote resistance. In the latter case, they mention a hypothetical example of genetically engineering species of amphibians for resistance to the deleterious chytrid fungus, in addition to a more familiar example that might render the idea somewhat less sci-fi: the genetic engineering of blight-resistant American Chestnut trees (see 2014, “Prescriptive Evolution to Conserve and Manage Biodiversity,” *Annual Review of Ecology, Evolution, and Systematics*). (As an exercise for the reader, the last example could be a good intuition pump to gauge one’s willingness to tolerate “prescriptive evolution”: is this admissible, given that the *Cryphonectria parasitica* fungus was itself imported by humans?)

Outside of their revealing examples, MB&M also offer a bit of informative commentary on scientists’ and practitioners’ lack of debate over these fundamental normative issues, e.g., “Curiously, those engaged in the conservation of the evolutionary potential have apparently not engaged very far in this debate” about “new conservation” versus a commitment to “a certain value of naturalness or wildness” (p. 1374). They correctly point out that this is significant omission, and that “the fit of [conservation of evolutionary potential] to the degree of naturalness underlying conservation values and goals must be looked at from the broader perspective of normative issues surrounding the conservation of biodiversity” (ibid).

Near the end of their article, MB&M again broach the position that I recommend, that “it is the processes of life, not just existing entities, that should be valued for themselves, and among these processes, the evolution of life is a prominent candidate for intrinsic value” (p. 1374). (As I exclaimed on a first read, “Yes! Finally!”) However, this still leaves open the question of the degree to which it is acceptable to allow human activity to influence these processes. MB&M aver that from this process-oriented perspective, “evolutionary potential, in almost any form, becomes an end for conservation as much as a means.” That, however, does not seem quite right, not if our specific concern is the preservation of *autonomous* evolutionary processes, given what we’ve now seen to be a high degree of human intervention countenanced by some proposals for conserving evolutionary potential. As I’ll emphasize in §5, life will evolve whether or not it is impacted by humanity, and whether or not the organic inputs to the evolutionary process have themselves been modified by the actions of our species. This reveals why it’s not quite enough to say even that *the process of evolution is intrinsically valuable*. Wilderness advocates must never lose sight of the essential normative importance of the *self-willed* – self-willed *evolution* as much as self-willed land and self-willed beasts.

In their subsequent discussion of the “naturalness” dimension, MB&M point out – rightly – that “favouring the ‘natural’ (unassisted) expression of evolutionary potential does not necessarily imply the conservation of a more pristine, or ‘natural’ state of biodiversity” (p. 1375). This is similar (if not identical) to the distinction that I made in §1 between the process of evolution (which may or may be assisted or hindered by human actions) and the inputs to that process (which may or may not be attempted to be to restore to a more natural or pre-human baseline). The naturalness (or autonomy) of the process does not imply the naturalness of the state. In §6, I propose that the normative ideal for conservation should be *both* – permitting the process to unfold with minimal human influence, of course, *but also* (when possible) restoring baseline conditions closer to what evolution had previously chosen for itself.

5. Problems for Rewilding’s Received View on Evolution

Milot, Béchet and Maris provide an overview of approaches to the conservation of evolutionary potential that is much more encompassing, thorough, and up-to-date than the occasional off-hand references in the rewilding literature to the importance of sustaining evolution and its building blocks. Having reviewed their lay of the land, we’re in an even better position to point out what’s wrong with the “received view” of evolution in the North

American rewilding tradition. One part of this view – perhaps the most canonical – has it that the obligation to protect wilderness follows almost immediately from the normative commitment that evolution is good (§5.1). Another, closely related, is that the “building blocks” of evolution that we are to preserve must themselves be elements of wild nature (§5.2).

The problem is that neither of these above conclusions follows from the premise that “evolution is good,” nor that assumption that the “holy work” of conservation is to protect evolutionary processes or potential. Importantly, this should *not* lead us to conclude that a central focus on evolution is *wrong*. Instead, the message is that rewilding and wilderness advocates need to be more precise about their claims, so as not to look like fools. Our goal is not to protect evolution generally speaking, but to *respect its autonomy* as a natural process.

5.1 Wilderness is an Arena of Evolution

According to Soulé, the postulate that “evolution is good” implies an “ethical imperative to provide for the continuation of evolutionary processes in as many undisturbed natural habitats as possible” (1985, p. 731). Similarly, Foreman writes in *Rewilding North America* that “Nature reserves have to protect entire ecosystems, guarding the flow and dance of evolution. We have finally learned that wilderness is the arena of evolution” (p. 114), invoking Leopold, who writes in his essay “Wilderness” that “Only those able to see the pageant of evolution can be expected to value its theater, the wilderness.”

The biggest problem with this assertion that “wilderness is the arena (or theater) of evolution” is that it’s false. Wilderness, no doubt, is *an* arena of evolution – but the word ‘the’ implies uniqueness, and wilderness is demonstrably not *the only* arena of evolution. Likewise, the postulate that “evolution is good” does not by itself necessarily entail a need to protect *undisturbed natural habitats*, given that evolution also occurs in disturbed, unnatural habitats.

We need only consider antibiotic-resistant bacteria, the textbook example of evolution in action. The use of antibiotics to protect human populations against the selective pressures of pestilence is, arguably, human intervention in evolutionary processes *par excellence*. And yet without the invention and use of antibiotics, there would have been no evolution of antibiotic-resistant strains. Similar points could be made about the evolution of [pesticide resistance](#) in insects. Or take another classic textbook example of evolution by natural selection: [the Peppered Moth](#) (*Biston betularia*). In wild nature, the black-colored variant of *B.*

betularia is rare, and black moths presumably would have remained rare if the pollution of coal factories hadn't tainted England's trees with soot. Anthropogenic pollution, not wild nature, provided that environmental change that caused dark coloration to be advantageous for survival and reproduction – and, hence, evolution. More recently, extensive human harvesting of fish has been recognized as a selective pressure that favors the survival of fish that breed earlier and reach a smaller adult body size, and anthropogenic climate change is likely to select in favor of animals with body sizes and shapes that more advantageous in warmer environments (see, e.g., [“Abiotic conditions shape spatial and temporal morphological variation in North American birds”](#) and [“Shape-shifting: changing animal morphologies as a response to climatic warming”](#)). In the previous examples, human influence inadvertently caused evolutionary changes, but humans can also act as an evolutionary force directly and intentionally – from the domestication and selective breeding of animals and plants, to recent proposals for [assisted evolution](#) or [prescriptive evolution](#), as mentioned in §4.

We've already seen that acceptance of human impact on evolution, whether direct or indirect, is compatible with many positions within MB&M's taxonomy of approaches to the conservation of evolutionary potential. One could hold, for example, that the *reason* to conserve evolutionary potential (in the form of, say, genetic diversity within a population or species) is to protect biodiversity in the face of anthropogenic disruptions: the greater the genetic diversity within a species, the more likely that some members of that species will possess heritable traits that are advantageous in the face of novel environmental changes and stressors – just as with the melanic moths in industrial England. Such an approach to conservation is incompatible with envisioning evolution as confined only to wilderness.

Now, of course I agree with Leopold, Soulé, and Foreman that we ought to protect large and undisturbed wilderness areas, and moreover that we ought to do so for the sake of the continuation of evolutionary processes. The problem is that we'd appear woefully ignorant to leave it at that, without admitting that evolutionary processes can indeed continue in our cities, hospitals, pesticide-laden farms, and other heavily anthropized environments. Wilderness is but one of many arenas of evolution. Foreman, I think, moves us closer to where we need to be when he declares that “Evolution is wild.” Presumably using ‘wild’ in the sense of ‘self-willed’ (for how else would he use it?), he's undeniably right insofar as evolution can occur, does occur, and for many millions of years has occurred in the absence of any assistance or pressure from us. Evolution can occur autonomously, and it has an exceedingly long and venerable history of so doing. One might suggest that wilderness protection is less

about *protecting* evolution than *respecting* evolution – respecting, that is, its autonomous ability to create for itself, in the absence of any meddling from us.

Consider, by analogy, human actions performed under duress. If you put a gun to a person’s head and command her to walk, talk, dance, or sing, she might very well walk, talk, dance, or sing. (Okay, sure, if she’s crippled by fear, she might *not* be able to execute the actions demanded. As a general matter, however, we can go through the same motions under coercion as we can when acting under our own volition.) Despite this, most of us still tend to believe that liberty and autonomy are good, and that coercion is bad. Evolutionary processes, by analogy, will continue to act upon populations of organisms whether the process is unbridled from our impact or tightly constrained by it – but why should we assume that the two conditions are morally equivalent? We don’t in the case of free vs coerced human action.

I suggest, then, the following refinement: although it’s far from the only arena of evolution, wilderness *is* the only arena of free, self-determined evolution. Wilderness is the playing field in which evolution can continue to actualize its wild – self-willed – capabilities.

5.2 The Trouble with Building Blocks

In §1, I set up this essay with another gripe of mine: the lack of precisification of concepts like *building blocks*, despite their apparent importance for conservation (the “holy work” of the enterprise!). Worse, on any plausible gloss of what evolution’s “building blocks” really are, the mandate to conserve them simply doesn’t motivate rewilding or wilderness protection.

Now, in fairness, Foreman has occasionally told us what he means by this term. For example, in [Rewilding Earth Podcast Episode 1](#), he identifies the “building blocks of evolution” as “native species, natural processes, large chunks of land and oceans and lakes and rivers that are off limits to industrial civilization.” But this is an undeniably strange definition of evolution’s building blocks. As described above, evolution can and does occur inside the limits of industrial civilization, and evolution can result from “unnatural” processes like pollution or (more directly) artificial selection. Moreover, native species hold no special prerogative on the ability to evolve; for better or worse, non-native species can evolve too (see, e.g., “[Urban evolution of invasive species](#)”). Of course, native species, natural processes, and large areas wild terrestrial and aquatic habitat *can* serve as the raw material for evolution – and insofar as

we strive not to disrupt wild nature's own "will," they seem like especially virtue choices for a starting point, but it's simply false that evolution *needs* these building blocks to happen.

Instead, if anything deserves the 'building block of evolution' moniker, genetic diversity must be the leading candidate. If a population of organisms belonging to the same species is entirely genetically homogenous, then that population cannot evolve. Heritable variation in genotype is the essential raw material upon which evolution acts. But it simply doesn't follow that protecting heritable genetic variation *per se* requires the conservation of wilderness, nor the restitution of native species. Yes, *some* strategies for protecting this "building block" will appear friendly to rewilding. For one, it seems to enjoin us to aspire to prevent population sizes of plants and animals from dropping precipitously low. It is not enough, ideally, to prevent species extinction; we must also prevent *genetic bottlenecks* in which the genetic diversity of species decreases greatly due to a severe reduction in population size and subsequent inbreeding. But while the strategy of protecting large and diverse populations of wildlife is likely to appeal to rewilders, it's not the only potential strategy here. As another possibility, a conservationist who takes seriously a mandate to preserve evolution's building blocks might advocate genetic engineering to increase genetic diversity within a population – perhaps even beyond the diversity expected by natural variation. Some ideas that have been put forth under the heading of "prescriptive evolution" (mentioned in §4) might lie here, or the use of [assisted gene flow](#) to enhance diversity in populations of corals or other organisms.

Another obvious candidate "building block" is the existence of *selective pressures*, environmental factors that cause certain inherited traits to be more conducive to survival and successful reproduction than others. As we've already seen, though, selective pressures needn't be natural, and indeed human overshoot is producing very profound selective pressure, which might only be speeding the rate of evolution. As urban ecologist Menno Schilthuizen likes to put it, cities are "pressure cookers of evolution," causing genetic changes as animals are forced to adapt or die to new food sources, new habitats, and new threats. (We can acknowledge the phenomenon without painting it in the rosy way that Schilthuizen does in *Darwin Comes to Town*, nor need we adopt his fatalistic attitude toward human expansion.)

So how in the hell does the textbook picture of evolution by natural selection lead us to a demand for wilderness protection and rewilding? The short answer is that *it doesn't*. We can promote genetic diversity by preserving large populations of wild animals and plants, and banking on random mutation as a source of novelty. But, alternatively, we could intervene and

biologically engineer populations of animals and plants with greater genetic diversity than we would expect naturally. We could artificially speed the pace of mutations. As to the introduction of selective pressures, we can expect wild nature to produce its own selective pressures, but we also know that we can create them ourselves – often at a pace more rapid than wild nature would offer. Despite the demolition of most wild places on Earth, evolution itself isn't stopping. As long as there are *some* other species sharing our managed planet, descent with modification will happen despite our actions, and often because of them. The question is whether humans *ought to* have a hand in the process – or deliberately withdraw it.

Once again, the conclusion is the same: advocates for wilderness and rewilding mustn't misrepresent the facts as though the salvation of *evolution itself* is in our hands. When we demand that vast wild places be left untrammelled, and when we make this demand for the sake of life's future evolution, we must be clear that our mission is *not* to protect evolution *per se*. Instead, we're expressing our respect for evolution as a process capable of transpiring autonomously ... and, perhaps, our own wonder and curiosity at thought of what self-willed evolution will invent on its own someday, even if millions of years after our species' demise.

6. An Autonomy-Based Approach to “Conserving Evolution”

In this concluding section, I summarize my suggestions for how rewilding advocates ought to fine-tune our intuitive moral mandate to conserve evolutionary processes or building blocks, with an emphasis on respect for evolution as a creative force that excels without our input.

6.1 Autonomous Evolution is Intrinsically Valuable, Redux

Our takeaway from §5 was that it's not good enough to speak in terms of protecting evolution and its building blocks. To motivate the demand to protect self-willed land, we need to emphasize specifically the need to respect evolution's ability to unfold autonomously, as opposed to allowing it to operate only under control and coercion.

An important question, though, is whether the intuitions with which we began motivate this stronger claim, as opposed to merely a weaker claim like “evolution is good” or even “evolution is intrinsically good.” I believe, in fact, that they do. Think back to §3.1.3, where I argued that the postulate that “(self-willed) evolution is (intrinsically) good” should be

accepted as a self-evident and undeniable bedrock proposition, one that it is intuitively obvious upon mindful contemplation of life's history. Significantly, I was there envisioning an exercise of reflection on the deep-time history of life on Earth – from the earliest microbial life of the Archean, on through the enigmatic multicellular life of the Ediacaran (cf. my Twitter handle) and the subsequent “explosion” of diversity in the Cambrian, on through the “big five” mass extinctions and the resurgence of new and wondrous biodiverse ecosystems after each.

In this imagined exercise of imagination, I was *not* picturing a person dwelling on the wonders of antibiotic resistance or the fascination of the shrinking body size of cod as a genetic consequence of the selective pressure of overharvesting. Instead, the envisioned exercise was to reflect on the wonders and fascination of the autonomously unfolding evolutionary processes that long predated the emergence of any lifeforms capable of self-consciously and deliberately impacting them. That said, the adaptability of life is itself an intrinsically wondrous thing, even when it's instantiated through the evolution of antibiotic resistance in bacteria or pesticide resistance in insects (hell, in a way, it's *especially* satisfying when evolution flips the bird at humanity's attempts to control and restrain it...). Nonetheless, there is also something uniquely humbling about the deep-time evolutionary history of life, a history that proves beyond a shadow of a doubt that evolution doesn't need us and can't do very well without us. The autonomy of this deep-time evolution is an essential property, and it does seem clearly to be a property that contributes to the awe, wonder, and humility it causes us to feel.

As I also emphasized in §3.1.3, the point is not that autonomous and unbridled evolution is good *because* it causes humans to experience such mental states, but that the latter states should be accepted as morally probative – revealing the intrinsic value of (autonomous) evolution itself. When we love another person, we don't conclude that that person is merely instrumentally valuable because they cause us to feel love, and love is (sometimes) a pleasant emotion (but cf. [The J. Giles Band, 1980](#), for a more accurate depiction of love). When we love another person, it's just intuitively obvious and undeniable that that person is *intrinsically* valuable. Here is an even closer analogy: for religious believers, feelings of awe in the presence of natural beauty and wonder are commonly accepted as morally probative. Supposedly, such experiences reveal to us the glory of God and His fittingness as an object of reverence. The devout are right, I claim, in the intuition that this non-cognitive experience should lead us to recognize the need to respect a force much bigger and older than humanity, and to be modest and humble before it. We atheists can learn from this instinct, as far as it goes. But they are wrong that this force is a supernatural deity. The object revealed worthy of

reverence, respect, and deference is nothing but self-willed nature itself – including the autonomous evolutionary processes that have shaped all of life as we know it (not to mention the additional hundreds of millions years of past and future life that we can only imagine).

While it will inevitably leave some unsatisfied, I will rest here with this sentimentalist account of the intrinsic value of self-willed evolutionary processes. The latter value statement is a truth I hold to be self-evident, and my gamble is that it will be similarly self-evident to others who take the time to unburden themselves from the practical worries of the day-to-day and lose themselves in mindful and engaged contemplation of the deep-time history of life on Earth. For my own part, although I am both a philosopher and ecocentrist, the two are unrelated: my commitment to ecocentrism has nothing to do with moral theory. I did not come to my moral beliefs about nature as a result of philosophical theorizing, nor can I offer any deductive argument to persuade others. True, science has a role to play in underpinning the obviousness of ecocentrism. It's simply a brute fact, for one, that *Homo sapiens* is nothing but a contingent result of billions of years of evolutionary processes that have shaped and reshaped life over and over again without our guidance or input. However, G.E. Moore was right, I think, that we can't conclude moral truths from brute facts about the way the world is – not deductively, at least. The missing link, I submit, is experiential and non-cognitive; if you're not already convinced of the intrinsic value of autonomously unfolding evolution, then a logical deduction isn't the route to convince you.

When we perceive evolution as intrinsically valuable, how are we to honor this in our conservation practices? In setting the general mindset, I suggest (in keeping with Uncle Dave Foreman) that we strive to manifest respect for its capacity to function autonomously and deference to the choices that it makes on its own. Anything else is hubristic, paternalistic, or otherwise disrespectful of evolution's long-standing status as an automatically-acting force whose self-determined powers and creativity far exceed our own.

6.2 Process, Potential, and Protecting Evolution's Autonomy

In concluding this piece, let's return to the distinction proposed in §1:

- (i) The degree/type of human intervention with respect to the inputs to the process (i.e., if you like, the “building blocks”) at some time t .

- (ii) The degree/type of human influence on the unfolding of the process over time.

I summarize what I take to be the implications of the above moral framework for both (i) (§6.2.2) and (ii) (§6.2.1), and contrast this with the positions of other rewilding proponents who attempt to use an evolution-focused framework to argue for *Pleistocene* rewilding (§6.2.3).

6.2.1 Re (ii): Let Evolution Be.

As already mentioned, the demand to respect evolution's autonomy seems to lead us to foreground (ii), and it further leads one clear answer: we must minimize our influence on the future unfolding of evolution. We need to preserve large areas of land and sea as wilderness, self-willed land, where we declare that the expansion of our human enterprise is off-limits.

One anticipated reaction, which seems presently *en vogue*, will be something like this: "Give it up! Humans control the entire planet – our influence is everywhere and unavoidable – so there's no sense in speaking of protecting evolution's autonomy." I have never understood this line of objection, given that it's entirely out of kilter with how we already think about respect for autonomy in more familiar domains, viz., that of human interaction. As I write this, I am in many ways acting of my own volition. I'm freely writing on a topic of my choosing (nobody asked me to do any of this, y'know; it's just a hobby). I am choosing to write at home, rather than at the library or a coffee shop, and I am choosing to write at this particular time of day (despite acknowledging that I really ought to get off my ass). More broadly, I've chosen a certain line of anti-careerism, and I've chosen to be single and child-free – all of which facilitates greater freedom and flexibility in the selection of day-to-day activities. At the same time, it's obviously false that I am completely free from the influence of – even dependence on – other people. I rely on the work of others for my WiFi connection and the beloved 2016 MacBook on which I continue to type. The coffee I sip is the result of a long supply chain involving very many other humans (and obviously I'd be incapacitated without it). Although I'm alone as I write, I'm disposed to have my actions impacted by others; I could be distracted at any moment by a task that awaits me at my day job or a text from a friend with an urgent need to vent. I'm not *fully* autonomous. Nobody is. But that doesn't mean that it's unimportant to respect our capacity for freely chosen actions in the many ways we *are* able to execute it.

Analogously, it seems a bit inane to reason from the premise that (for example) anthropogenic climate change will inevitably impact the future evolution of life to the conclusion that

humanity can impose on evolutionary processes however we damn well please. Quite likely, the future evolution of life *will* be ineluctably affected by anthropogenic climate change, but the future evolution of life is *not* ineluctably affected by future land conversion, infrastructure development, light and noise pollution, pesticide use, human population growth, and numerous other factors that *remain within our power to prevent*. The fact that *some* human impact on evolution is unavoidable is simply no excuse to conclude that *all* human impact is acceptable. There are still many choice points at which we can decide to let wild nature be.

6.2.2 Re (i): Strive to Respect Evolution's Freely Chosen Initial Conditions.

At first glance, (i) and (ii) might appear orthogonal, and indeed they might be treated as such. However, the normative framework that underlies one's answer to either (i) or (ii) might determine, or at least narrow, the possible answers for the other.

Suppose, for example, that one's goal in conserving of evolutionary potential is to preserve biodiversity for the sake of its value to humans, and specifically to promote the ability of biological lineages to adapt to the changes wrought by increased urbanization, infrastructure development, land conversion, and other forms of human expansion. The selection of appropriate vehicles of evolutionary potential, given this aim, falls under (i). Whatever vehicles of evolutionary potential are chosen for conservation efforts, the *justification itself* presupposes that humans *will* continue to be a major force influencing the future evolution of life, and that our goal is not to stop it, but to help give life the genetic diversity it needs to raise the chances of successful adaptation. Thus, the justification presupposes an answer to (ii), something like: "We can't control this; whatever will happen, will happen."

Under the present proposal, I have instead forefronted an answer to (ii): respect evolution's autonomous potential by protecting large areas of Earth free from all avoidable human influence (e.g. agriculture, development, disruptive or excessive recreation use, etc). I believe that the underlying moral perspective also constrains the admissible answers to (i). Specifically, I believe that part of what it means to respect evolution's autonomy must be to strive to restore the outcomes of previous self-willed evolutionary processes as they existed prior to acts of human intrusion and disruption, where this remains possible.

Proponents of rewilding sometimes take pains to deny that rewilding is backward-looking, and to a large extent they're completely right: the prevailing goal of rewilding should be to allow ecological and evolutionary processes to continue in their own way into an uncertain future. But that alone doesn't relieve us of an *additional* moral imperative to respect the choices that evolution has *already* made. It would hardly respect a person's autonomy to tell that person, "You will henceforth be free to pursue what you want in life, but before setting you free to your own pursuits, I will kidnap you from the house you bought for yourself in your favorite neighborhood, and force you against your will to emigrate North Korea." Nor would it respect a person's autonomy to rob them of the capital they'd accumulated with the plan to invest in a new business venture, thereupon assuring them, "Of course you're free to henceforth pursue whatever business venture you please, but the hell if I'm going to give back the thousands of dollars I stole from you."

As I noted in §1, a non-interventionist answer to (ii) doesn't necessarily imply that the answer to (i) must be "Leave things however they are *right now* as the starting point." Intuitively, some amount of intervention for the purpose of restoration is not only *compatible* with the goal of protecting the autonomy of future evolutionary processes but also, perhaps, *required* by the same underlying moral intuitions. I presume, for example, that few would object to conducting a litter clean-up on an area about to be designated as wilderness. And many would support removing even large pieces of litter – such as dams, roads, and other structures, as well as introduced species that have become invasive. Many readers who share Foreman's intuitions about the importance of wilderness will meanwhile unhesitatingly support the active reintroduction of large carnivores like wolves and cougars into parts of their former range from which they'd be extirpated. These activities obviously require human intervention, delaying the point at which we can say, "We shall henceforth let nature be."

At the same time, other forms of intervention would undoubtedly unsettle advocates for wilderness preservation and rewilding, even if the ultimate goal is to step back and leave nature alone. Many, I presume, would balk at the intentional introduction of genetically modified organisms, even if it's a means to boost the "evolutionary potential" of a landscape's starting point. If conservation approaches like [assisted evolution](#) are anathema to others who share my intuition that conservation should protect the autonomy of evolutionary processes, it should come at no surprise: it's something of a cheat to say that evolution should be granted autonomy, only to meddle with the components of the natural system that is to be left to evolve. It is still an intrusion. It still leaves an indelible human impact on the future course of

evolutionary history in a manner that is both intentional and avoidable. What's curious is not that some interventions seem unacceptable, but that *not all do*. In other words (removing the superfluous negations), what's curious is that some interventions *seem acceptable at all*.

If our goal – our moral mandate – is to remove our hand from the course of evolution, then why not do it sooner rather than later? On the surface, the execution of this mandate seems only to be delayed by litter clean-ups, dam removals, invasive species eradication, tree plantings, wildlife reintroductions, and other restoration activities. The intuition, of course, is that these restoration activities are acceptable (or mandatory) because the structures and species slated for removal are *unnatural* and, conversely, the species slated for reintroduction are *natural* and deserve to be part of their native territories and habitats. Now, according to one popular line of condemnation, this preference is arbitrary, representing no more than a human aesthetic judgment about what nature is “supposed” to look like. But I see no reason why this objection should hold water, given that there's a fact of the matter about the state of nature prior to the evolution of *Homo sapiens* and the species' subsequent global expansion. Sure, we might lack complete knowledge about the pre-human state of nature at any given point on Earth, and practical limitations might prevent us from ever being able to restore it with fidelity. But this doesn't imply that wild nature didn't exist in some specific, objective state prior to human intrusion; obviously it had to. If one wants to argue that epistemic and practical limitations are bound to prevent successful restoration, that's a different matter, but it's sheer poppycock to say that the “wild” and “natural” are human constructions, given that nature actually existed before humanity. Hell, even young-earth creationists could grant that, on the fifth day, fish and birds were “wild” – where this wildness couldn't be a human construction.

That said, I find it more useful not to think in terms of what is “natural” and “unnatural” but instead to conceptualize our choices as answers to the question “What would wild nature have (not) chosen for itself?” This also makes plain that our moral perspective is one of respecting the autonomy of a force that's fully capable of acting on its own – that it's about respect and deference to processes that are much older and larger than us, *not* a mere human urge for purity or naturalness. When we defer to the choices that wild nature would have made in the absence of human interference (as much as it's within our knowledge and capacity), we respect nature's autonomy by striving to respect the “choices” (i.e. the natural outcomes) that evolution made for itself, prior to some human disturbance that could have been avoided, whether the clearing of a forest, the draining of a swamp, the damming of a river, the fragmentation of habitat by the building of roads, the extirpation of native species,

the introduction of non-native species, the dumping of toxic waste, the disruption of natural light/dark cycles due to the installation of artificial lighting, etc. In each of these cases and many others besides, human activity disrupts natural processes in a way that could have been avoided (i.e. it is not merely a “natural” behavior of the human animal’s interaction with its environment), and in a way that wild nature quite obviously would *not* have chosen on its own.

Conceived within the framework of a moral mandate to respect the autonomy of evolution, the goal of restoration is to give back to nature a set of initial conditions closer to *what it had chosen for itself* prior to some avoidable human-caused disruption. By analogy, although I’m assured by friends in the service industry that the customer is *not* always right, we generally acknowledge customers’ right to choose for themselves what dish to order at a restaurant. Here is one manifestation of respecting that freedom: if a customer is served the wrong dish, the server takes away the incorrect item and returns what customer chose for themselves.

By way of example, consider several proposals for restoration following a hypothetical case of deforestation: (a) do nothing and allow regeneration to unfold on nature’s own terms; (b) actively plant some trees belonging to the species assemblages that existed in the area prior to deforestation (and then avoid further intervention); (c) actively plant trees whose natural ranges lie farther to the south, assisting a northward migration that’s hypothesized to help the species survive in the face of anthropogenic climate change; (d) actively intervene to maintain the open landscape resulting from deforestation and prevent passive forest regeneration.

The diehard non-interventionist might always choose (a), which does respect nature’s autonomy – to an extent. However, the appropriateness of the choice of (a) over (b) is likely to depend on the particular circumstances. Suppose, for example, the deforestation was complete and widespread, and there are no nearby seed sources for the native flora. In this case, we might readily predict that without restoration wild nature’s subsequent course will diverge from what wild nature *had already chosen* prior to the deforestation (which, of course, was itself a coercive act imposed on it). Perhaps there will be no natural forest regeneration, or perhaps invasive species will overtake the landscape. In such a case, (b) might in fact be the option that best respects nature’s autonomy, for it aims *first* to give nature back its own prior choices, and only then withdraw to let nature carry on as it will. In contrast, the intervention involved in (c) does not seem to represent respect for nature’s autonomous choices. Climate change will inevitably become a significant factor impacting the future evolution of life, and it is a good practical reason to allow nature *space* – large and connected

areas of wild lands – in which it can make its own choices as to how to respond, adjust, and adapt. But assisted migration, in my view, is a step too far – proactively (and paternalistically) making decisions *for nature* about the constituents of future climate-adapted ecosystems.

Finally, (d) is included as a throwback to my essay “[In Memory of Anholt as I Never Knew Her](#)” about this very type of case study; little, it seems, could manifest *less* respect for evolution’s autonomous choices (cf. also the “double bind” for Refarming Europe in §4.2 of [this essay](#)). But it’s also a useful contrast with (c), serving to highlight two different ways in which we can fail to respect the autonomy of wild nature. In the case of management programs in which human intervention is used to artificially maintain an open landscape (as on Anholt or in many other cases of heathland preservation), the continuing active intervention removes any semblance of respect and deference to the natural flow of self-willed evolutionary and ecological processes. In contrast, in the case of (c), the practitioners of assisted migration could claim that they are merely updating nature with a new set of initial conditions to help it cope with global warming, and that thereafter they will refrain from future intervention and allow nature to take its course. My claim here is that the latter scenario still represents a form of *disrespect* for nature’s autonomy – roughly analogous to telling a person “You’re free to live as you choose, but only after being forced against your will to quit your job and relocate.”

The general message is this: even if our ultimate goal is to “let nature be” in large protected areas, a commitment to respect the autonomous choices of evolution should also influence whether or not – or how – we engage in any restoration activities prior to leaving natural processes to their own devices. If Milot, Béchet, and Maris’ article gives any indication, the desideratum of “restoring evolution’s own self-willed choices” seems entirely off the radar of mainstream conservationists who concern themselves with evolutionary potential. They say little about the topic. However, in their discussion of “genetic essentialism,” they suggest that the goal of the “recovery of ‘pure’ historical genomes” is antithetical to the very aspiration of conserving evolutionary potential (p. 1371). But it is not quite clear why the essentialist bias should seem surprising or appalling if one of our goals is to select “vehicles” of evolutionary potential that are as close as possible to what wild nature had chosen for itself, prior to human intervention. A major reason for this, I would surmise, is that conservation almost always has a consequentialist bent; it is unusual to think in virtue-theoretic terms about a moral imperative to act with respect, humility, or deference to the processes of wild nature – but such a virtue-based approach is precisely what I am suggesting.

6.2.3 More Re (i): Contrast with “Pro-Evolution” Pleistocene Rewilding

Before finally ending this long essay, I will contrast the ideas put forth in §6.2.2 with the conclusions of two very different evolution-focused articles in the rewilding literature. Both are proposals for Pleistocene rewilding: the translocation of surrogate species for extinct North American megafauna. Now, if you’ve read any of my [condemnations of European “rewilding”](#) (and, if not, what are you waiting for?), then you already know that I’m no fan of the use of proxy species, and this is precisely because they *don’t* represent evolution’s own autonomous choice for a region’s fauna; they are mere functional substitutes to meet human-desired ends. Evolution, given time, will invent its own functional substitutes to fill ecological niches left open due to extinction; if we’re too impatient to wait, that’s our problem, not wild nature’s.

In its North American lineage, Pleistocene rewilding often lacks the overt anthropocentric tendencies that are so deplorably common in the European “rewilding” movement and discourse. Indeed, some of its proponents endorse openly ecocentric motives – as we’ll see below. The rhetorical framing notwithstanding, however, I believe that the use of proxy species is no more morally sound in the case of translocating cheetahs, elephants, and so on to North America than in the (numerous) cases of using (semi-)domesticated horses and cattle as surrogate species for tarpan and aurochs in Europe. In either case, conservationists introduce species of their own choosing, unwilling to exercise the patience and restraint to defer to whatever long-term solution evolution would autonomously invent to replace missing megafauna. (In fact, the aspirations of North American Pleistocene rewilding are arguably *more* problematic, given its proponents’ simultaneous endorsement of genuine wilderness areas, as opposed to the European norm of small fenced enclosures – shall no wild part of the continent remain free from populations of unnaturally introduced non-native megafauna?)

The problem with proxies follows directly from the perspective presented in §6.2.2: if our basic moral mandate is to respect the autonomy of evolutionary processes, then the goal of any restoration project should be to restore wild nature’s own previously self-selected course of development. Certainly, when we intervene in areas that are to be protected as wild, our actions should never bring nature *farther* from the outcomes that evolution has naturally chosen. But whenever we introduce non-native species into a landscape, we do just that – even if the goal is to increase biodiversity, evolutionary potential, or ecological completeness (which, we might note, are all instrumentalist aims that presuppose human rather than geological timescales). Note that Pleistocene rewilding would be morally problematic in this

way even *if* humans were the cause of the late Pleistocene megafauna extinctions: non-native species are still non-native if even those to introduce them are motivated by guilt and a desire to make amends. But it is *particularly* problematic given the “overkill hypothesis” is far from uncontested (for a recent article on the topic see, Stewart et al, 2021, “[Climate change, not human population growth, correlates with Late Quaternary megafauna declines in North America](#),” *Nature Communications*). If megafauna extinctions were themselves natural rather than human-caused, then there now seems to be a twofold moral problem with any attempt to replicate the Pleistocene megafauna through the translocation of surrogate species: not only do we defy evolution’s own choices when we move animals from their ancestral habitat to a geographic location entirely outside of their native range, we also defy evolution’s choices by presumptuously attempting to reverse the effects of a naturally caused extinction event!

There are also numerous practical and ecological worries about Pleistocene rewilding (see, e.g., Rubenstein et al, 2005, “[Pleistocene Park...](#)”), but that’s the essential moral concern that arises from the framework proposed here. Curiously, though, some advocates of Pleistocene rewilding base their proposal in part on considerations related to evolution; it’s therefore illustrative to look at their reasoning and see where the differences lie.

First, in an (in)famous piece published in *Nature* (“Re-wilding North America,” 2005), Josh Donlan and colleagues declare that Pleistocene rewilding is a way to “restore some of the evolutionary and ecological potential that was lost 13,000 years ago” (p. 913). They state that, “In the coming century [...], we will constrain the breadth and future evolutionary complexity of life on Earth,” and worry that the “default scenario will surely include ever more pest-and-weed dominated landscapes, the extinction of most, if not all, large vertebrates, and a continuing struggle to slow the loss of biodiversity” (p. 914) – if we don’t, that is, take bold measures like restoring the continent’s megafauna. In response to the potential objections that “the proposed proxies are not genetically identical to the animals that formerly existed in North America” and that the proposal “might strike some as ‘playing God,’” Donlan et al say only that “‘same’ is relative,” noting the successful use of a mix of captive-bred subspecies of peregrine falcon as a proxy for the extinct midwestern subspecies of peregrine falcon (p. 914).

Donlan et al are clearly concerned with the restoration of the specific form of “evolutionary potential” contributed by the existence of large mammals in ecosystems, and they’re just as clearly *unconcerned* with genetic purity. While they do not themselves define their specific concept of evolutionary potential, we already know from our review of Milot, Béchet, and

Maris that a commitment to restoring it doesn't imply – by any means – a commitment to the intrinsic value of self-willed evolution. Donlan et al breeze through a plethora of justifications for their proposal, moral and practical, anthropocentric and non-anthropocentric, but overall their main interest emerges as the protection of biodiversity and ecosystem services on human timescales, with “evolutionary potential” seen as means to secure this. They do not necessarily perceive the process of evolution as its own end.

Although it lacks the reach and influence of Donlan et al, an even more interesting article for present purposes is Connie Barlow's article “Rewilding for Evolution,” [published in *Wild Earth*](#) in 1999. It's especially interesting due to its overt non-anthropocentrism and, specifically, its emphasis on the thesis that evolution should be placed at the core of an ethic for rewilding. Barlow immediately sets out her thesis that it's wrong to permit human activity to influence a lineage's “evolutionary futures.” Significantly, she does not fall into the trap of suggesting that wilderness is somehow necessary for evolution to occur at all. Instead, she rightly notes that “whatever each of us may feel about the propriety of intentional genetic manipulation conducted in laboratories, such pales next to the reality of the evolutionary consequences that our species is forcing upon life everywhere outside the scientist's lab” (p. 54). Barlow recognizes that humans are a selective pressure, to the extent that even certain forms of recreational access to wilderness may result in human impact on future evolution:

Backpackers should be easy to hunt; nevertheless, if a large carnivore experiments in this direction, the innovator will be tracked down and killed. Intermittent exposure to the magical powers of humans to kill or wound at a distance does seem to preclude that kind of experimentation in the wilderness region I am most familiar with – the Gila Wilderness in southwestern New Mexico. There bears and lions are hunted for sport. In this, the first of all designated Wilderness Areas, the evolutionary futures of wild beasts are thus profoundly influenced by human demands for meat and recreation (ibid). [Barlow doesn't mention whether the disposition to hunt backpackers or not is a heritable trait, but I take it we're to accept that it has a genetic component.]

All the more, she opposes active management of conservation areas to preserve biodiversity's *status quo*: “Even well-intentioned and scientifically based management decisions in the most excellent of biodiversity reserves designed to preserve this planet's evolutionary heritage are an inescapable manifestation of humanity's unchecked reach into evolutionary futures” (ibid). Presumably, then, she would also share my antipathy towards direct attempts to steer “evolutionary futures” through “assisted” or “prescriptive” evolution. And, presumably, she'd oppose anthropogenic manipulation of the course of evolution via the

translocation of species to entirely new continents outside of their native range... *right?!*

Barlow herself asks, “If an endemic subspecies is now extinct, should another subspecies be introduced [...]? Similarly, if a keystone species is extinct, should an ecological proxy — perhaps from another continent and of another genus — be introduced?” (p. 55). Her own thesis would seem to answer this straightforwardly: no and no.

In fact, however, Barlow pivots to *support* the use of such ecological proxies (“from another continent and of another genus”) to replicate North America’s late Pleistocene megafauna guilds. It’s a logical transition that I can only describe as a *non sequitur*. It seems manifestly inconsistent with her own central normative premise: if we translocate a species to an entirely new geographical region, can our action be construed as anything *other than* a case of humanity influencing the future evolution of that species? As I read the article, Barlow confusingly conflates a defense of the *autonomy of the evolutionary process* — one, indeed, that is quite similar to that which I have defended here — with a Donlan-like appeal to a need to (re-)diversify North America’s megafauna for the sake of *evolutionary potential*. When she addresses what I’ve called our factor (ii), Barlow defends a thesis very much like my own in §6.2.1. However, for reasons that elude me, she fails to recognize the constraints that the same underlying normative perspective places on admissible answers to (i) (see §6.2.2).

Emma Marris, science writer and champion of managing the planet under the guise of conserving it, seems to be among the fans of both Donlan and Barlow, judging from her book *Rambunctious Garden*. She also follows Barlow in failing to recognize how a genuine commitment to nature’s autonomy should simultaneously inform both our factors (i) and (ii). In her chapter of praise for novel ecosystems (e.g. ecosystems with a high proportion of non-native species that nonetheless fail to be monocultures of invasives), she avers, “if what one values is not any existing species or ecosystem per se but the process of evolution, then novel ecosystems are worth protecting. [...] [N]ovel ecosystems are really wild, self-willed land with lots of evolutionary potential” (p. 121). Sure, and if we replace a person’s material possessions with a lot of s*** they don’t want, and replace that person’s friends with a bunch of people they dislike, and thereupon leave them be, that’d really be a self-willed person...

(Incidentally, Marris’ chapter on “rewilding” is *not* in tension with her thesis of a “post-wild world,” since she chooses to limit her attention to Donlan and — you guessed it — Frans Vera. I’ve argued before that Oostvaardersplassen is far from manifesting respect from self-willed land, so there’s no need to go there. But Marris provides a quote from Donlan, in response to

the “playing god” objection, that intrigues me: “[...] We are already playing god.’ The leap, he says, is ‘admitting to ourselves that we live in an intensely managed world’” (p. 64). Contrast this with Foreman’s repeated entreaties to humanity to exercise restraint and humility, and to let wild things be. Donlan’s position on wild nature is much closer to that of Martha Nussbaum (!) than to that which served as the moral foundation for the original rewilding movement.)

6.3 Coda: Forward-Looking Deep-Time Thinking

Although I have not so far placed much emphasis on it, a unique feature of the above normative framework is its indifference to criteria such as biodiversity and other measures of ecosystem health, which are typically foregrounded even in non-anthropocentric perspectives. (Self-willed) evolution is taken as an end in itself, and restoration is oriented around a virtue-theoretic framework of expressing respect and deference to wild nature (specifically, the autonomously “chosen” past outcomes of evolutionary processes); unusually, the goal of restoration on this picture is *not* to better facilitate the preservation of biodiversity, ecosystem services, or any other particular desired outcomes, whether ecocentric or anthropocentric in their motivations. Indeed, there might be cases in which the protection of biodiversity or other outcomes would be more effectively served by conservation actions that do not represent any plausible outcome of self-willed evolution; such, at least, is often the justification of the use of surrogates of extinct species, when it’s worried that ecosystems will collapse without *something* to play the functional role of the lost species. However, if the primary purpose of wilderness conservation is to preserve large areas in which evolution is free to continue autonomously, then there should be no reason to modify nature in these protected areas for the purpose of biodiversity conservation, ecosystem health, etc., simply because there is no doubt that self-willed evolution *will* sort all of this out on its own terms. When we feel the need to intervene, we are thinking in human timescales, not evolutionary ones. The ultimate act of humility and deference is to trust evolution to find its own way to restore lost biodiversity and degraded ecosystems – even if not in our own species’ lifespan.

Now, I don’t propose that we should *never* engage in interventions for the sake of protecting extant biodiversity that might perish without active conservation efforts. I don’t claim that it’s morally wrong to install gourds for Purple Martin (*Progne subis*) to nest in the Eastern US, say, or to manage for early successional jack pine habitat or suppress native Brown-Headed Cowbirds to sustain the existence of Kirtland’s Warbler (*Setophaga kirtlandii*). What’s important is that such artificial or continuous interventions *not be conflated* with the

independent imperative to conserve wilderness in order to allow evolution to choose its own path. When we commit to set aside large areas of the planet to allow evolution “unfold in its own unhobbled way,” then within these areas we must do just that – even if that means suppressing a desire to prevent local or global extinctions by any means necessary. No, protecting an area as unmanaged wilderness is not a surefire guarantee that all species therein will persist indefinitely, thanks to extinction debt, future consequences of climate change, etc (and not to mention the fact that extinctions do occur naturally in wild nature).

Foreman admonishes us, “For wilderness and wildlands today, [...] Man must show restraint — braking our self-willed might — by leaving some lands and wildlife alone, by not stamping our will on them.” Typically, we think of human restraint in terms of reining in our impulse to take more and more of the planet *for ourselves*. But, equally, conservationists must rein in the impulse to manage all nature for the purported good of ecosystems, species, or wildlife. My proposal is that – at least in large areas of Earth set aside for wild nature – we must prioritize the freedom of evolution over the sustenance of particular ecosystems, species, or wildlife populations. That means holding back, being patient, and admitting that evolution can take care of itself, even if its own timescale for restoration is more on the order of [10 million years](#).

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