




Why Wake the Dead? Identity and De-extinction

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Abstract

I will entertain and reject three arguments which putatively establish that the individuals produced through de-extinction ought to be the same species as the extinct population. Forms of these arguments have appeared previously in restoration ecology. The first is the weakest, the conceptual argument, that de-extinction will not be de-extinction if it does not re-create an extinct species. This is misguided as de-extinction technology is not unified by its aim to re-create extinct species but in its use of the remnants of extinct populations as a resource. The second is the argument from authenticity; the populations produced by de-extinction technologies will be inauthentic if they are not of the extinct species and, therefore, will not be valuable. I argue authenticity is not required in conservation as the value of authenticity varies between people and cultures, and the novelty of de-extinct species will be equally desirable in many cases. The third argument is from retributive justice; we need the de-extinct population to have the same species identity as we owe a moral debt to the extinct population. I find the case for retributive justice unconvincing and argue that acting as if we have a duty to resurrect extinct species will result in a world with less species. Ultimately all the arguments that connect de-extinction technology to species identity fail, leaving us to consider a more complex calculus for the justification of de-extinction in conservation.

Keywords De-extinction · Identity · Environmental ethics · Restoration ecology · Conservation · Authenticity

Introduction

The Lazarus Project is an evocative title for a de-extinction project. A group of scientists, working under the moniker of the biblical resurrectee, is working to ‘resurrect’ the extinct Gastric Brooding Frog. This fascinating Australian frog gestates its own tadpoles within its stomach, ‘giving birth’ from its mouth to small frogs. Using

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a process called somatic cell nuclear transfer, scientists are inserting cells, extracted from the extinct frog's frozen tissue samples, into the embryos of related frog species. They hope to produce a living clone of a dead individual from that extinct species. The product of this ambitious process will undoubtedly be very similar to a Gastric Brooding Frog but is it of the same species?

This is a reasonable question to ask. De-extinction is sold as the re-creation of a lost species. The act of de-extinction is thought to be deeply entwined with the question of species identity. When scientists like Beth Shapiro (2015), public policy figures like Jacob Sherkow and Hank Greely (2013), or philosophers like Helena Siipi (2014), Ronald Sandler (2014) and Douglas Campbell (2016, 2017) discuss what justifies de-extinction, they consider whether we can or should re-create lost species. There has been a long, and at times entertaining, discussion in philosophy over whether personal identity can survive splitting, fusion, temporal gaps, and teleportation (Parfit 1984). The extinction and resurrection of populations through de-extinction technologies creates material and temporal discontinuities in lineages that raise analogous questions (See Delord 2014; Siipi and Finkelman 2017; Slater and Clatterbuck 2018). Just as we may ask whether Lazarus, arisen from his tomb, is the same as the Lazarus who expired we can ask whether the first batch of barfed up frogs are truly Gastric Brooding Frogs.

But there remains a further, and more important question: does it matter? There are several arguments for why identity is important for de-extinction. Some proponents of these arguments believe that de-extinction is only really justified if it re-creates an individual of the previously extinct population. This paper will show these arguments are not justified. De-extinction does not rely on the re-creation of species identity for its justification. De-extinction is a sub-class of restoration ecology. The arguments deployed to link identity and de-extinction have already been used to argue restored ecosystems must have historical fidelity with previous ecosystems. I utilize the literature against historical fidelity in restoration ecology to support the position that de-extinction does not require identity. Just as in restoration ecology there is a swath of reasons to do de-extinction outside the scope of identity. The arguments addressed here for the re-creation of species identity are not exhaustive. For one, I only aim to address arguments connected to conservation biology and environmental ethics. There may yet be many unexplored justifications for resurrection in de-extinction within conceptual space and with different metaethical support. The debate around de-extinction will play out in the public sphere and I aim to address the ideas that are either already circulating or are likely to appear soon.

With these caveats in mind, I will address three arguments for why resurrection is required of de-extinction. The first is the weakest, the conceptual argument, that de-extinction will not be de-extinction if it does not create an extinct species. This is analogous to Eric Higgs argument that restored ecosystems must be designed with historical fidelity as historical fidelity is conceptually entailed by restoration (Higgs 2003). The second is the argument from authenticity. This is a direct application of the arguments against restoration by Eric Katz and Robert Elliot to de-extinction (Elliot 1982; Katz 1996). Helena Siipi particularly defends a weakened version of an argument from authenticity to say de-extinct populations are of diminished value to the original population (Siipi 2014). The final argument is that we owe a duty

towards species that we have caused to become extinct. Retributive justice demands that if we have the technology to do it, we owe a debt to the extinct species to re-create it; therefore, the de-extinct population should be the same species as the extinct population. Michael Archer, leader of the Lazarus Project, and several philosophers believe that anthropogenic extinction entails a moral debt being owed to the extinct species (Archer 2013). Ultimately, all these arguments fail leaving us to consider a much more complex calculus for whether de-extinction can play a substantive role in conservation.

Conceptual Entailment

Often philosophers are enamoured with conceptual arguments that to the public look extraordinarily weak. These arguments are structured as follows, the concept of *x* has some necessary content, and this content entails that some further proposition *y* is true analytically. It is taken to be analytically true that all bachelors are unmarried men. Any statement that claims that bachelors are not unmarried men is therefore false, as it is essential to the concept itself that unmarried men are bachelors. It could be argued that de-extinction is necessarily the act of bringing an extinct species back into existence: species resurrection. If the species is not re-created, then de-extinction has not occurred. The need to address this argument is indicated by scientists already attempting to articulate the *true meaning* of “de-extinction” with Helen Taylor et al. (2017) stating “(t)here is confusion generally regarding what de-extinction means; many people do not appreciate that de-extinction actually involves creating a technically feasible proxy... rather than an impossible resurrection” (1). Conceptual arguments, discussing the content of a term, have been forwarded in restoration ecology by Eric Higgs (2003) to argue that historical fidelity is conceptually required for ecological restoration.¹ I consider the responses to this argument and defend against those who would argue that species resurrection is conceptually entailed by de-extinction.

In the face of such conceptual claims there are several routes critics can go down to respond; I will deploy two classic responses. First, in the face of a claim about the content of a concept one can argue against the necessity of that content. This can be done by identifying linguistic diversity amongst the informed community of concept users. Another option is concept change: respond to those who make a necessity claim by making a new concept and argue that this new concept is superior or of more interest than the old concept. Both philosophical moves have been done in response to the claim that historical fidelity is necessary for restoration projects and I outline how to do the same for claims in de-extinction science.

¹ Higgs’ (2003) view is quite nuanced. This conceptual argument only appears in the larger context of his view, in which restoration projects must consider how to engage local human populations in a relationship with nature. As such, the conceptual argument may be considered instrumental for engaging the public in conservation projects. I recommend reading his book to understand how this conceptual argument sits within his larger ethical framework.

To establish that restoration does not conceptually require historical fidelity Sahotra Sarkar identifies cases in which restoration ecologists conduct restoration without historical fidelity or define restoration without reference to history (Sarkar 2011, 2012). He states that in cases such as Baclones Canyonlands; “Historical fidelity is not adopted as a goal in some circumstances because the historical past of a locale cannot be reconstructed with the data that are available.” (Sarkar 2011, 353) As strong fidelity is not possible in many restoration projects it is not reasonable to expect it.² Further, some restoration ecologists do not use ‘restoration’ with historical connotations (Garson 2016, 328). Hobbs and Cramer (2008) define restoration in an inclusive way noting that ‘restoration covers a wide range of activities ranging from the purist perspective, which seeks to return an exact copy of the pre-existing ecosystem and all its species to a degraded area, to less ambitious but no less worthy goals to return a degraded area to some sort of functioning ecosystem, to basic aims of returning some sort of vegetation for erosion control or food and fiber production.’ (40). These cases undermine the necessary connection between history and restoration. Finally, Sarkar attempts to move away from describing these projects as ‘restoration ecology’ preferring ‘habitat management’ or ‘habitat reconstruction’.

The shape of the conceptual argument as applied to de-extinction is very accessible. ‘De-extinction’ has the linguistic content of undoing an extinction. An extinction applies to a species. If this species is not brought back, de-extinction has not occurred. We can, however, find the same disconnect between the connotations of the term and the use of the term by the informed scientific practitioners. This is up front and centre in Beth Shapiro’s *How to Clone a Mammoth* (2015). As an informed scientist using this technology to re-create the passenger pigeon she states; “*I don’t care* that (a de-extinct passenger pigeon) is not the same thing as the original’ (authors emphasis) and ‘there is no compelling reason to make perfect replicas of extinct species” (205). For Shapiro the project of de-extinction is disconnected from the question of identity.

Not caring about identity makes sense. De-extinction is not necessarily connected to creating the extinct species. De-extinction is better thought of as *a set of techniques utilizing the remnants of extinct populations*. Therefore, de-extinction is not directed towards the re-creation of an extinct species. It involves the use of the remnants of extinct populations, including extinct intraspecies variation, as biological resources. Wherever these remnants are found, be it in the preserved remains of organisms or in closely related species or even as information inferred from phylogenies. What unifies these techniques are the knowledge we gain from past living, and as a result viable, organisms.

Re-creating ‘species’ is not even essential to de-extinction. Introducing extinct variation into populations will be a growing area of de-extinction. This I believe is more important than de-extinction as focused on species and more likely to be successful. This would allow for the introduction of extinct variation into endangered species like the Tasmanian Devil. An identity relationship between an extinct

² I also believe this is the case for de-extinction but wish to focus on the normative rather than the metaphysical.

species and a de-extinct population is not essential for de-extinction. The techniques used for de-extinction are quite different in their history and methodology; back-breeding is just the same selective breeding we have done for thousands of years, while using CRISPR to genetically engineer recovered DNA sequences is only 5 years old. They use different molecular machinery: somatic cell transfer moves the entire nucleus of a cell while CRISPR inserts just small sequences into an extant population. What unifies the techniques as de-extinction is not how effective they are at reproducing extinct species but that they are being used with extinct populations as a resource.

If someone stubbornly demands that these techniques not be described as de-extinction one could yield and rename these techniques. One option could be ‘biodiversity enhancement’ or ‘biodiversity enrichment’ as alternative names for ‘de-extinction’ given these techniques increase diversity in extant populations. This will raise auxiliary issues around the sources of genetic variation and whether engineered variation ‘legitimately’ contributes to biodiversity (See Siipi 2016). Ultimately, terminological changes will need to be subject to debate within the relevant scientific community, considering what the scientists involved wish to convey about their research. Regardless of the term used, this research forms an interesting new sub-discipline within conservation science and even if the name is a little misleading to the public, the work itself is not diminished.

To conclude, conceptual arguments are generally viewed as weak within the sciences and their application to conservation science are a case in point. Higgs (2003) has attempted to develop one in restoration ecology but has been deftly countered by Sarkar (2005, 2011, 2012) and Garson (2014, 2016). The same argument when entertained for de-extinction purports to establish that the re-creation of a species identity is needed for the science to be successful. This, however, misunderstands the aims of the scientists, the techniques involved, and the goals of conservation generally.

Authenticity and Identity

Authenticity has historically been central to environmental ethics and conservation efforts. The concept of wilderness or ‘nature’, as an area separate from humanity, is a striking example of how authenticity has influenced conservation. Nature is commonly thought to be a powerful teleological force, separate from humanity. Something we can test ourselves against, and within it, experience something greater than ourselves. The autonomy and power of nature is what provides it with authenticity and acts to control nature diminishes its value. It is the act of controlling, subduing, or mimicking nature that certain environmental ethicists view as so abhorrent. This historical view has influenced more rigorous philosophical views in both restoration ecology and de-extinction with Elliot (1982) and Katz (1996) providing arguments that the value of ecological systems is diminished by restoration and Siipi (2014) arguing that the products of de-extinction are replacements that lack the value of the original species.

In restoration both Elliot (1982) and Katz (1996) argue that a particular etiology is necessary to retain nature's value. This is thought to be the same for species; the unique historical process of evolution is part of what makes a species valuable. Some, like Siipi (2014), describe de-extinct populations as 'inauthentic' and as a result of diminished value to the original. To justify the intuition that value is derived from etiology Elliot uses the thought experiment of art forgeries. If we found out an indiscernibly identical piece of artwork was a forgery, we would value it less. The artwork needs to possess the right identity to be of value, the identity being the artwork originally created by the artist. This thought experiment turns on individual psychology and it may be true case to case, but Elliot aims it to be indicative of a deeper truth about the value of nature. He believes that nature's value is non-anthropogenic in origin, and ultimately intrinsic. Applying this argument to de-extinction, in the same way that the artwork requires the same identity to retain its value it has been argued that de-extinct species require the same identity to be similarly valued (Minteer 2015). This is described as the 'species genesis argument' (Campbell 2017).

There is nothing in Elliot's thought experiment which could indicate authenticity is a source of non-anthropogenic value or why nature's non-anthropogenic value is derived specifically from a non-human etiology. I, like many others, am sceptical of nature's intrinsic value due to (i) there is the ontological problem of where value could come from without an agent valuing it (ii) there is the epistemic problem of how we can know exactly how much intrinsic value there is (iii) if intrinsic value is priceless or of infinite value, as some claim, then it will impede environmental decision making (Weston 1985; Justus et al. 2009; Colyvan et al. 2010). Treating authenticity as a source of non-anthropogenic value for either species or ecosystems is quite implausible without some further story about what the connection between these two things is.

Katz attempts to connect authenticity to value by arguing that restoration makes nature into an artefact. An artefact is thought to be different from natural systems because we imbue it with our own design, we make it functional for our purposes, whereas he states that nature "lacks intrinsic functions". By imbuing function on nature, we remake the world as anthropogenic in an act of dominion over nature.³

This view is not particularly credible in light of modern accounts of naturalized function (Garson 2016). Naturalized functions have been a core part of philosophy for 40 years with both selected-effects functions and organizational functions describing functions as real parts of the world (Neander 1983; Millikan 1984; Mossio et al. 2009). Katz must deny the existence of such functions while affirming that there are ontologically real functions born from human agency. There is an oddness to this, and it requires further clarification that I have not found within his work. One charitable explanation is that, according to Katz, function

³ For a deft and convincing refutation of Katz's argument that restoration results in the domination of nature consider Andrew Light's (2000) discussion. Light argues convincingly that restoration is an important part of environmental practice and addresses Elliot and Katz's arguments on different grounds to my own.

necessarily requires agency. But once natural systems are designed, they begin to work under their own power. When an ecosystem is restored or a de-extinct species released, they will have their own trajectory in nature, displaying their own agency. Further, holding that a single use from an agent defines an artefact's function leads to counterintuitive conclusions in even common human artefacts. I often use a cigarette lighter to open a beer; according to Katz the lighter henceforth is a bottle opener. Agential use and design often pull apart in human artefacts and the same holds for natural function and use. Just because a person uses a leaf to wipe their bum it does not follow that it wasn't designed for photosynthesis. Single use or intervention by agents does not intuitively trump long standing design principle or autonomous action.

While Siipi does not appear to ascent to Katz's metaphysics of functions she does appear to agree to his claim that intervention creates artefacts and artefacts are of diminished value. She argues that de-extinct organisms are *substitutes* and *inauthentic*. The primary aim of this discussion is to establish that saving a population is always preferable to re-creating a population. Her discussion is summarized as an investigation into these two alternatives:

(F)irst, not having x (for example passenger pigeon) or anything of its kind, second, having y that resembles x (y is, for example, a bird that is not a passenger pigeon but resembles them to some degree). It is not self-evident that having y should then be favoured. **Since it is not x, bringing it to existence cannot merely be justified by anthropogenic loss of x.** Regarding the quality meaning of authenticity, the question concerns the choice between not having x and having a **poor or lousy x.** (Siipi 2014, 91 (bold for my emphasis))

Without Katz metaphysics of functions or an explicit appeal to psychology Siipi does not provide a clear reason for why artefacts have diminished value, it appears to be just assumed. This analysis of the issue accepts that authenticity is a unique value but that substitutes can be justified if they serve an alternative purpose worth pursuing.

As far as I can see there is no option for Elliot, Katz, or Siipi to establish a basis for etiological value in nature which is not indexed to agential value. At times all of them lean towards such a justification, Siipi quotes a quite anthropocentric Katz stating:

What people value in undeveloped nature is its natural history separate from human causation and activity. In an area that has been modified by human action there is a different causal history. Thus, even a perfect ecological restoration lacks the value the original natural system it is re-creating, for the restoration was the product of human action. (Katz 2012, 68–69.)

This statement about biological systems seems plausible. If people see ecological systems and landscapes as having value derived from being separate from humanity, then this value is real. Bob Goodin outlines this relational anthropogenic source of value in *Green Political Theory* (1992). He argues nature is

considered as valuable as it provides a way for people to find meaning in their lives by viewing themselves as linked to something bigger than themselves. Participating in a natural world which we view as autonomous and awe inspiring provides us with meaning.⁴ Many environmentalists support similar accounts of the way nature inspires or overawes us and this experience can transform our values (Maier 2012; Norton 1987; Sarkar 2005). The important question is whether environmental awe and experience *requires us* to believe the environment has had a particular etiology.

The etiology of ecological systems will appeal to many people. I think we should concede this to the authenticity critic. People's connection to the landscape and environment is deeply cultural. The western conception of the environment is local to people of certain cultural backgrounds, but it is no less real because of it. This is true of other cultures as well who have their own connection to the environment. I would be devastated if Kata Tjuta was levelled and then rebuilt from scratch, but it would be even worse for the Pitjantjatjara for whom Kata Tjuta features prominently in their Dreamtime stories. What is important is to incorporate in the process of habitat preservation the stakeholders who have some connection to the environment (Sarkar 2005, 2011).

If authenticity's value is derived from cultural custom and the psychology of individuals, then it is not a particularly robust source of value in natural systems. Firstly, not everyone will desire 'authenticity' in ecological systems or de-extinct organisms. Siipi states that a de-extinct organism will be of diminished value due to their inauthenticity, but I would counter that people may value them more for being inauthentic! The novelty of bringing back an organism, which is 'the same' as an extinct species adds to the value of that organism for many in the public. This feature is sometimes described as the 'argument from coolness', that people are generally in awe and excited by the prospect of de-extinction (Sherkow and Greely 2013; Turner 2014). The novelty and coolness of producing previously extinct populations is much more profound than simply seeing extant species. The sight of a living breathing "Thylacine" bought back after 90 years of extinction is for many more thrilling than seeing the equally amazing extant Tasmanian devil. A fear of the love of coolness and novelty appear to be a motivation for Elliot (1982) whose arguments are aimed at motivations for the replacement of ecological systems rather than the improvement of already impacted systems. If these motivations are too powerful, they may justify replacing rather than preserving species (see ""[Entertaining Duties Will Result in Species Loss](#)"" section for more on trade-offs between extant and extinct species).

There is no necessary connection between authenticity as people experience it and causal etiology. It is an empirical question as to people's psychological states when they go into an environment. Research is needed to determine the effects of

⁴ Some environmental ethicists believe intrinsic value is relational, depending on the agents who value the entity (Elliot 1992; Sandler 2010). If intrinsic value is relational, it is dependent the act of valuation by the relevant agents and ultimately their unique individual psychology. Therefore, my argument still bears on this type of value.

knowing a biological system's etiology. Restored ecosystems are sought out and enjoyed by people regardless of their status as restored systems. People could have a non-causal conception of species identity and authenticity. Doug Campbell in his plea to resurrect an 'authentic huia' defends the proposition that: 'for de-extinction purposes, Pb counts as being the same species as Pa just to the degree that many of the evolutionarily adaptive traits possessed by the members of Pa have been genetically inherited by and are phenotypically expressed by members of Pb.' (2016, 757).

Notice Campbell is not providing an account of species identity or taxonomy. This relation is only described as being '*for de-extinction purposes*'. According to Campbell the purpose of de-extinction is to bring back an organism which possesses certain aesthetic qualities; ones that will result in 'feelings of wonder, awe, pleasure, and appreciation' (757). These qualities will be experienced by a 'well informed person' who 'would be recognizing them to be the product of natural selection operating on ancestral huia in the same brush' (757). On this formulation of authenticity, it is a relationship between co-adaptive features in the de-extinct species and the extant environment. This is of course contingent on that historical environment being extant, which may be questionable due to environmental change since that population has become extinct (Seddon et al. 2014; Robert et al. 2017). But we can see that for at least some authenticity is not an etiological relationship or one coupled with a strong taxonomy of species.

Authenticity can in certain contexts play a role in conservation, but this role is not necessarily connected with identity or etiology. Attempts to establish identity and authenticity as values which do not depend on the cultural and psychological norms of individuals are deeply flawed. Further, the novelty of de-extinct populations will create their own value. This indicates de-extinct projects should be diligent in their public outreach, making sure their chosen project is something that interests the public and engages them. It does not show species identity is necessary for authenticity or even that authenticity is necessary for justified de-extinction.

Duties to the Dead

Public interest in de-extinction was piqued in 2013 by the TEDX public conference, which brought together the scientists at the forefront of innovative new de-extinction technologies. Michael Archer's announcement that the Lazarus project had succeeded in creating the early stage embryos of the extinct gastric brooding frog made headlines. In addition to this grand announcement Archer made a philosophically very powerful claim that may have went unnoticed by some. He states that:

If it's clear that we exterminated these species, then I think we not only have a moral obligation to see what we can do about it, but I think we've got a moral imperative to try to do something, if we can.

TEDX De-extinction (June 2013)

This implies we have a duty to bring back extinct species and if we have the technology we should. The re-creation of species identity is critical to the de-extinction

project as it is needed to satisfy this moral debt. If we create a new population that just appears to be the extinct population, we have not fulfilled our duty to the extinct population.

This deontic moral stance has been repeated within the philosophical literature with Karim Jebari (2016) arguing that causing extinction is a ‘moral transgression, entailing a residual obligation’ and ‘humanity has a prima facie obligation to recreate species whose extinction mankind may have caused’ (211). Similarly, Shlomo Cohen (2014) argues that we have duties to resurrect as: “If I kill you, thereby breaching my moral duty, but then serendipitously find out I can resurrect you (say, by praying for your revival), then surely a natural correlate to my duty will be to act for that restitution.” (172). He believes due to the duty to preserve life we have a duty to resurrect life even in the species case. This deontic argument has been entertained by several other authors (Thomas 2012; Greely 2013; Cottrell et al. 2014). Both the scientist Archer and Thomas and philosophers like Jebari and Cohen converge on a similar, ultimately flawed, position.

This position first assumes a deontological conception of morality and duties: that agents are warranted moral rights and duties and if an agent wrongs another they owe them a moral debt (Kant 1996 [1797]). There is considerable reason to be sceptical of deontology and agent centric accounts of morality (Kagan 1998). For the purposes of replying to Archer (2013) and Jebari (2016) I reluctantly accept that there are deontic moral norms by which we can have duties towards individuals and wrong them.

Why Should We Owe a Debt to Extinct Species?

Traditionally duties are directed towards agents who can experience a wrong. To experience being wronged an agent needs to have interests that can be impeded or welfare that can be diminished. For an agent to have either welfare or interests then they must be alive. Contra Archer (2013) and Jebari (2016), it is extremely implausible to think that extinct species could be entities which experience being wronged as they are not agents and do not currently exist.

Ronald Sandler (2014) particularly has emphasized the absurdity of this position as populations, or species, lack interests and have no welfare; both key for establishing agency (cf. welfare Basl 2017). One could press that some collectives have agency (List and Pettit 2011). But species are not the sort of thing which share goals or actions or work in co-ordinated ways. This makes them disanalogous from human collective institutions like corporate bodies (Feinberg 1974). Species are often distributed across multiple environments with significant heterogeneity in their characteristics. Even if we were to spuriously ascribe agency to populations, extinct species are dead agents. Stating we have wronged them makes as much sense as stating we have wronged the spirits of our ancestors, when you don’t believe ancestral spirits exist. To me this seems cut and dry. Extinct species are not the sort of things that can act as agents and if deontology is a moral system between agents it is not applicable to extinct species. In the face of this seemingly insurmountable issue Jebari

(2016) provides two rejoinders focusing on future generations and reparations for past wrongs.

Future Generations

The existence of duties to non-existent entities, which are not agents, is obviously controversial but many believe that we do have duties to future generations (Parfit 1984). Future generations are both non-existent and the identity of the particular individuals that comprise future generations are modally fragile. Our actions can change their identity and we still commonly believe we have a duty towards them (Parfit 1984). It is reasonable to think that we owe some obligation to future generations as our current actions can have negative effects on the agents who comprise them. Climate change is a well discussed case in this vein (see Page 2007). Jebari claims that if we can consider ourselves as holding duties to future generations then we should also have duties to extinct species (2016, 215).

Duties are demanded by future generations despite their current non-existence as they are a modally robust feature of the future world. The existence of future people is near certain. So, while strictly being non-existent, they are still able to make demands due to the modal stability of their impending existence. The fact we as individuals, or as part of the society we belong to, cause future generations to exist makes us partially morally culpable for the experiences of these future people (Parfit 1984). But even more directly our actions, regardless of whether we have children or not, will affect these people. If we ruin the Earth future generations are left to pick up the pieces.

The features that ground the demands future generations can make on us are, however, lacking in de-extinct populations, making the analogy untenable. Extinct species have already existed and died. It will take an incredible amount of direct and intensive effort to come even close to re-creating an extinct species. While I am focused on the question of whether species *should* be bought back by de-extinction, rather than *can* they, I will note that there are strong reasons to believe identity will be difficult, if not impossible, to re-create (Siipi and Finkelman 2017; Shapiro 2017). This makes their future existence extremely unlikely, and if ought implies can, or at least ought implies feasible, then the possibility of species resurrection is relevant to whether there is a duty to resurrect them. There are good reasons to reject infeasible moral claims (Southwood 2016).

The justifications used for duties to future generations cannot be used to establish duties to extinct species. Extinct species are unlikely to experience the world we are altering and even if they will exist it will be the result of the actions of relatively few individuals compared to the proportion of people whose actions will result in the next generation. As such wider society does not owe an obligation to them. A better analogy between duties towards future generations and species is that we could possess duties to future species. This would make more sense than duties to extinct species as we directly affect the world that future species will inhabit. Our impact on the environment will affect their future wellbeing. This, however, does not justify any duties to extinct species.

Reparations and Extinction

A slightly better case can be made that we owe a duty to past species in the same way that we owe reparations for past wrongs to collective groups of people. Jebari draws attention to the reparation's agreement between Germany and Israel (Jebari 2016, 214). This agreement was based on the understanding that the 'German people' had committed a wrong to the 'Jewish peoples' (Honig 1954). Cases of reparations between nations or ethnic groups openly refer to collectives and the actions of these collectives within the past to instantiate moral claims about retributive justice.

While cases of reparations between collectives for past wrongs appear to be more apt for establishing humans owe reparations to other species, this comparison still leads to absurdities. In all cases for which we owe reparations, the collectives are still present. When Germany owes reparations to the Jewish peoples due to the wrongs of past German generations there are Jewish people they owe these debts to. Current Jewish people are owed because they inherit disadvantages including the loss of culture and more concrete goods that these previous wrongs have denied them. The agents who comprise these collectives have experience of a wrong and this justifies the moral debt. While people still exist, who are connected to the collective that suffered the wrong, in the extinct species case there are no inheritors of that wrong. There is very little case to be made that there are any individual agents or collectives that have inherited any loss or moral debt in the case of the extinct species. The species is dead and there are no inheritors of the moral wrongdoing.

In the human case, genealogy is used to establish belonging to a historical collective, be this genealogy be biological or cultural. One could argue that species genealogy could be used to connect a historical moral debt to the closest living relative of the extinct species. This has implications, which I find desirable in the cases of Mammoths and Thylacines as we would then owe debts to Asian Elephants and Tasmanian Devils. But the existence of positive implications in some cases does not make a valid argument. Related species do not experience a wrong as individuals or collectives for the loss of related relatives. They may in some cases experience a gain! Related species are often morphologically and behaviourally similar; the removal of their relative may reduce competition and provide opportunities. Further, treating related species as inheritors of moral debt has little analogy in the human case. I think few in modern societies would believe that they inherit a moral loss from their nearby relatives without suffering some aspect of that loss themselves.

A stronger case could be made that we owe moral debt to the ecological community that the species belonged to. Due to the population's removal, the ecosystem was degraded or diminished, and this facilitates a moral debt. We would then owe that system and one way to rectify this debt would be to replace the species that was lost. Similarly, Derek Turner argues that introducing a de-extinct population could restore an ecosystems health after the damage inflicted by extinction (Turner 2014). First, it is worth noting that the identity of the species that is being restored to the environment is not consequential. The debt is owed to the community and any population that rectifies the historical loss will be adequate. This argument, therefore, does not establish that species identity is of consequence to de-extinction.

There is a dilemma for the environmental ethicist who argues that ecological communities have been wronged through species loss. If they claim that the system was strongly impacted by the loss of a species the ethicist must be able to establish that there is some continuity between the identity of the historical system and current system. If the current system is extremely similar to the historical system, then it is difficult to establish that the ecological community suffered any loss due to the removal of the extinct species.

The identity of ecological communities is notoriously difficult to establish. Lean and Sterelny (2016) argue that ecological communities are not natural kinds in a way that allows for diversity metrics to be used to quantify their different properties. The same goes for their identity. Ecological communities do not have clear identity conditions separate from the populations that constitute them. Radical change in the populations that constitute a community counts as change in the community identity. Changing community identity is taken seriously by the ecologists who research introducing de-extinct species to natural habitats. Phillip Seddon et al. (2014) argues that in many cases the community that the species belonged to has now disappeared (as does Roberts et al. 2017). The possibility of successful introduction would then be fleetingly small and a terrible investment. This is not unnoticed in the philosophical literature with Eric Desjardins arguing communities are path dependent (Desjardins 2015). If communities are path dependent the contingent removal and addition of populations could radically alter the community's identity. Species loss then can result in the loss of anything that could feasibly have a moral claim to reparations.

If the loss of the species does not result in a change of the community other than the loss of that particular species, then there is no real claim to a moral wrong. This case seems extremely common. If a community's features are the product of ensemble robust interactions, then other populations will compensate the loss of a particular species. Mutualism networks have a strongly nested structure where most species are generalist, relying on many other species (Bascompte et al. 2003). The removal of any one species is unlikely to have any further effects on the community other than providing the opportunity for several populations to increase their size. Therefore, there is no community that inherited any wrongdoing.

Reparations are the wrong framework to establish a current duty to extinct species. Reparations rely on some inheritor of a wrong and in the case of extinction there is no clear inheritor to demand reparations (also see Rohwer and Marris 2018).

Against Duties

While the arguments for having duties to extinct species are lacking, I wish to raise some against having deontic duties to extinct species. The process of establishing that we have a duty to extinct species will have some drastic negative implications. It creates an epistemic burden for establishing whether humans caused a species to become extinct. This act of identifying the blameworthy humans will further have serious political implications. But the most important reason why we should not entertain duties towards extinct species is that it will overall reduce the amount of species in the world.

Establishing Guilt

There is an epistemic burden created by believing we have moral duties to species we caused to become extinct. To know we have a duty to a species we must establish that humanity was the causal factor which resulted in that extinction. Extinction occurs constantly through the history of life (Barnosky et al. 2011; De Vos et al. 2015). Establishing that an extinction was caused by humans, or causally influenced by humans, rather than a natural extinction requires a huge investment of resources. Further, causal influence can come in different degrees. Humans could have a partial role in extinction in combination with other stochastic or ‘natural’ processes such as non-anthropogenic climate change or a volcanic eruption. It is unclear whether partial culpability is enough to establish a duty to de-extinct.

There is a significant difference in epistemic standards required by Archer (2013) and Jebari (2016). Archer has a higher standard of evidence for establishing moral guilt than Jebari. For Archer it needs to be ‘clear’ we caused the extinction while Jebari is content with the much more inclusive ‘may have caused’ (Archer 2013; Jebari 2016, 211). Archer places a higher bar on the causal influence humans need to have exerted on the extinct population. Jebari allows for a huge inflation of duties to populations, where we only need to have played some part to owe the population a debt. The ramification of this costly burden will be further discussed in the next “[Entertaining Duties Will Result in Species Loss](#)” section.

Establishing humans have caused an extinction not only will cause issues in term of resource allocation but there are serious political ramifications for attempting to establish a causal connection between non-western populations of humans and extinct species. Debates about whether indigenous people caused the extinction of populations have been charged. For example, the debate about what caused the extinction of Australian Megafauna, like the Diprotodon (a wombat the size of a rhinoceros), has raged for at least 40 years. Some scientists argue that these species were hunted to extinction, while others claim it was climate change (Miller 2005; Koch and Barnosky 2006; Dortch et al. 2016). To require the establishment of anthropogenic causation in extinction, to justify a duty to resurrect a species, would undermine relationships within the conservationist community. This is not to say that political controversy trumps science or ethics, but this indicates uncomfortable debates will be entailed by duties to extinct populations.

Establishing guilt, therefore, creates epistemic burdens requiring us to establish humanity had a causal role in extinction, raises conceptual questions as to whether we must be “the cause” or a “causal factor” in extinction to be morally culpable, and finally, has political ramifications as establishing indigenous peoples are guilty of causing an extinction is extremely controversial.

Entertaining Duties Will Result in Species Loss

It is believed that in just the last hundred years approximately 500 *vertebrate species* have gone extinct (Ceballos et al. 2015). The expected background extinction rate for that period is estimated at 10 species. But human caused extinction is, of course, not limited to recent times with humans causing extinctions for tens of thousands

of years. The sheer count of species that we have caused to become extinct is staggering.⁵ If there are duties to resurrect species, then there are duties to an incredible amount of entities. It is obviously untenable to invest in resurrecting all these species. But we may limit this to duties to species that we both caused to become extinct and it is possible to resurrect. I believe even in cases where resurrection is possible, we do not have a good *prima facie* reason to attempt resurrection. This is because at some stage we need to assess the cost of such a duty and the cost of resurrecting species is that we will not protect fragile species that are currently endangered.⁶

One of the biggest impediments to conservation is the lack of funding to preserve species. While triage is controversial it is widely accepted in Australia and New Zealand and functionally it happens everywhere, the decision making is just less publicly obvious (for an introduction to triage see: Bottrill et al. 2008). Any investment in de-extinction should be assessed against what could be gained by investing that money into extant species. There are currently very few individuals who advocate for the public funding of the de-extinction process but there are many who assume that the state will accept the cost of maintaining these species once they are released. This will create significant burdens on environmental agencies. Even if external funding sources took on the cost of maintaining these species, the opportunity cost of these funds need to be assessed. This money could be spent on extant species to maintain their populations or do expensive translocations to preserve extant species like the introduction of the Eastern Bettong into Mulligans Flat Woodland in the Australian Capital Territory.

Recently, Bennett et al. (2017) calculated the cost of resurrecting an extinct species. In their calculations they generously assumed that external funding would provide the money to produce a small population of de-extinct individuals. But once a population is produced it would create a burden on public funding to preserve this now endangered small population. They found that for the cost of funding the 11 species proposed for de-extinction in New Zealand they could preserve 31 extant species and that if the external funding for five focal extinct species in New South Wales was invested in extant species 42 different species could be saved. This is all in excess to the cost of discovering that we caused a species to go extinct as well.

Given this current state of play I find it hard to justify investing the money in extinct species. Again, for there to be a justified moral claim that we should engage in species resurrection it needs to be shown that this is feasible and not barring many other more morally salient alternative actions. This is particularly problematic if one is to consider the moral weight of our duties toward extant species versus extinct

⁵ This is based off estimates of human caused extinctions (Ceballos et al. 2015; Sandom et al. 2014). This does not mean we are in a good position to know whether any particular extinction was caused by human action. Instead these are estimates on the data around the difference between background rates of extinction and the rates of extinction when human populations either move into a region or rapidly expand in size. So, while we know extinctions occur, it is difficult to attribute individual extinctions to human actions.

⁶ This I will fully admit involves entertaining the idea that we have to do some sort of utility calculation. But many deontologists defend threshold/non-absolutist/moderate forms of deontology duties can be weighed in some sense (Kagan 1998, pp. 79–84).

species. While extinct species are non-existent, modally fragile, non-agents, who our actions will not affect, extant species exist, and their modal fragility depends very much on our actions. It seems clear that if there is a duty to species, existing species have a much stronger claim to our public and private investment than extinct species. This compounds the fact that for the money spent on a single extinct species we could preserve considerably more extant species. Resurrecting an extinct species is not as morally important as preserving an extant species and for the cost of resurrecting an extinct species we could save many extant species.

We Have No Duties to the Dead

Duties to extinct species demands us to act in the interests of non-existent, modally fragile non-agents, whom our current actions cannot influence as they currently do not exist. They are extremely abnormal recipients of duties. While we may accept that we have duties to populations of people, future people, extant species, or future species, it seems implausible to entertain duties to extinct species. To accept extinct species further seems to open the possibility of duties towards a mind-boggling set of entities and entails an explosion of duties. But most importantly, if we act on these perceived duties to extinct species, we will have a world with less species as our resources will be drawn away from more effective projects.

Conclusion

Interest in the identity of species created by de-extinction has increased and I suspect in the next five to ten years there will be several further philosophy papers which will discuss the metaphysics of species resurrection (Delord 2014; Siipi and Finkelman 2017; Slater and Clatterbuck 2018). While there have been a range of arguments which aim to establish that identity is important in de-extinction I have found them all lacking. The conceptual argument is particularly weak and based on a naïve understanding of the science of de-extinction. De-extinction science uses the remnants of extinct species as a resource rather than being about the re-creation of species. Authenticity is important for many agents but for many people the novelty of these species will bring about its own value. Finally, there is no reason to believe we have distinct duties towards extinct species.

We can ask whether we are then justified in using de-extinction technologies at all. I do not argue that de-extinction is not justified, there are reasons to engage in de-extinction (Rohwer and Marris 2018). These include:

- Recreational and aesthetic reasons: The joy people will receive from seeing a living creature they never thought they would see is morally significant.
- Functional proxy: We may create populations that can act as functional proxies for the extinct species, which can act to support many other populations.

- Technological improvement: The investment in de-extinction from non-publicly funded sources will improve technologies that can then be used to preserve extant species.

These reasons for de-extinction will often trade-off against other environmental concerns and may often be outweighed by the need to invest in extant species. Non-environmental reasons will, however, I suspect be the major catalyst for de-extinction. The public's desire to see organisms resembling the lost species will predominantly drive the use of this technology and ultimately constrain it as well. Fears over unrestrained genetic engineering and justified precaution will stop scientists creating and releasing radically unique populations. But notice these reasons have no relation to the question of what the de-extinct populations species identity is. Moving forward in the ethical use of biotechnology in conservation will take serious thought. But I, as of yet, see no strong reason that species identity has any bearing on the normative justification for de-extinction.

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