Extreme environmental restoration and its social fabric

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Introduction

The practice of environmental restoration is crucial to balancing development with responsible environmental governance. Underpinning environmental restoration, though, are important questions regarding scope and scale, broadly captured in the questions: "To which historical benchmark should we restore?" and "What is the appropriate level of intervention in satisfying this benchmark?". Responses to these questions are typically motivated by consideration of current political and natural environments and therefore do not much exercise the imagination. A notable exception is the Pleistocene rewilding movement, prescribing the cultivation of lost ecosystems in order to restore the pre-human capacities of environments to self-regulate and as a bulwark to further extinctions. Put another way, Pleistocene rewilding can be seen as ecosystem restoration to a pre-human benchmark. Inherent in this benchmark, though, are uncertainties regarding the impact on the social fabric of affected communities

Although many examinations of ecological restoration strategies have taken up the first question posed above (i.e. appropriate benchmarks), this paper considers the social and cultural dimensions of extreme restoration efforts with respect to the second question (i.e. appropriate intervention strategies). In practice, these two considerations are not so neatly cleaved and in fact may be interdependent on each other. By considering the impact of intervention strategies on the social fabric of affected communities aside from considerations of benchmark-setting, I aim to develop an account of restoration efforts that can help to better anticipate beforehand the social consequences of those efforts. After briefly exploring the role of 'intervention strategies' in restoration efforts, I turn toward the social, logistical, and technological elements of extreme rewilding efforts with respect to their intervention strategies and consequences.

Pleistocene Rewilding

Rewilding, in general, falls under the broad umbrella of ecosystem restoration approaches. The striking difference setting rewilding apart is the lack of continued human intervention after initial conditions are met. Rewilding seeks to provide the conditions for the natural environment to assert its own autonomy and self-regulate without further intervention from human institutions (Taylor, 2005; Prior 2016, cite others). Wild nature, in this respect, is nature that exists, operates, and self-perpetuates without the aid or management of human institutions. A common example of this ideal is the Oostvaardersplassen Reserve in the Netherlands. The Oostvaardersplassen Reserve is a rewilding project that was developed and operates on the philosophy that large herbivores are the key to restoring pre-human ecosystems to European environments by helping to maintain the balance between open grasslands and closed-canopy forests (Vera, 2009). If the large herbivores were the key to self-regulation, then the reserve could operate independently of human interference and, as such, realize the rewilding ideals of autonomic natural regimes. It should be noted (and will be discussed later in this paper) that the non-interventionist ideals of rewilding are not entirely met in the Oostvaardersplassen for social reasons that should be anticipated and accounted for in rewilding projects.

Pleistocene rewilding combines the autonomic view of nature with the historic benchmark of pre-human environments. Archeological evidence suggests that large vertebrate extirpations are correlated with increasing human populations which, it is suggested, had "undoubtedly ecologically and evolutionarily significant" (cite Nature article) changes to the natural landscapes. If we must choose a historical benchmark to set for restoration standards, then it is argued that we should strive to restore to pre-human benchmarks. For example, (Nature article) suggests that this benchmark includes the reintroduction of [camels, cheetahs, etc] to swaths of previously developed yet currently unused land in the Great Plains of the United States. These mega-fauna, as argued, will provide critical functions that help to restore ecosystemic balance to the Great Plains while providing the conditions for autonomic natural regimes.

Thus, Pleistocene rewilding is a restoration method that maintains pre-human ecosystems are appropriate historical benchmarks and an abstinence from human intervention in the development of the ecosystems (beyond meeting initial commitments) is an appropriate intervention strategy. It is this last point – intervention strategies – that run central to this analysis and should be better considered in restoration efforts.

To Intervene or Not to Intervene?

Restoration ecology can be characterized, broadly, as actively intervening in an ecosystem to return that ecosystem (or some part of it) to a predetermined benchmark (Corlett, 2016). Underlying this broad conception are two core components that serve to delineate different approaches to ecological restoration: [1] Selected intervention strategies and [2] Selected benchmarks. The selections restoration practitioners make with respect to each of these dimensions serves to align the particular restoration project with a broad restoration literature, philosophy, and tradition. For example, if a certain restoration project aims to restore a species of game-fish to an ecosystem with the intent of managing it for harvestable populations, then the project can be broadly categorized as 'restocking'. Similarly, if a project aims to return a site to a self-regulating pre-human benchmark, then it is categorized as 'Pleistocene rewilding'.

Corlett (2016) examines the conceptualization and operationalization of a range of restoration terms including "reconnect, recover, recreate, reforest, rehabilitate, reinforce, reintroduce, remediate, repair, restock, restore, revegetate, and rewild" (page?), broadly clustering them under the three categories of restoration, conservation translocation, and rewilding. Again, I contend that each of these categories – and the sub-categories contained within them – are distinguished by unique selections regarding the benchmarks and intervention strategies deemed appropriate. Most obvious, perhaps, is the role of benchmark selection in distinguishing restoration initiatives as the differences in the subjects of restoration (e.g. a forests, a species of fish, a marsh ecosystem) are easily identified, intuitively classified, and stand as traditional units of study in their respective sciences. Less obvious though is the role of intervention strategy in determining the character of the restoration initiative.

My use of 'intervention strategy' is meant to encompass both the breadth and depth of intervention in restoration efforts. This includes consideration of the duration, intensity, and methods of intervention. It is worth noting that this is not meant to be exhaustive of intervention

concerns – it is likely that the field of 'intervention' can be analyzed along multiple dimensions not recognized here. However, for the purposes of this paper it is sufficient to broadly outline the landscape of intervention strategies in order to structure a consideration of the social, logistical, and technological elements of extreme restoration efforts.

Duration

The relative success of a restoration effort can be seen as the amount of change toward a pre-determined goal that a specific site has undergone. If the desired outcome of a restoration effort is vastly different from the current state of the site, then the magnitude of change will be great if the outcome is ever achieved. Inherent in this general formula are decisions regarding how long humans are required to intervene, considered with respect to the timelines of the project. For instance, the previous example of the restoration of a species of game-fish for harvestable populations may require constant intervention until the populations are self-sufficient and their environments are capable of carrying the populations. Conversely, Pleistocene rewilding – characterized by being "initiated by human actors, but [intending] to reduce the level of direct control over rewilded species or ecological assemblages" (Prior & Brady, 2016, p. 8) – may require a shorter duration in order to let the natural environment assert its autonomy, i.e. *wildness*. In this case, practitioners may intervene only inasmuch as is required to create the conditions for a novel ecosystem and then retreat in order to allow the ecosystem to achieve balance without human moderation. Thus, the duration of intervention would be relatively short compared to the restoration of the game-fish.

Worth noting in this brief description are the boundary cases where intervention is either lacking entirely or where it is weaved into the objectives of the restoration so that it is required as long as the restoration is being pursued. I do not mean to suggest that a non-zero yet definite duration is necessary for restoration projects to be conceived as such. A site chosen for restoration precisely by removing *all* human intervention (insofar as is possible within the constraints of large-scale human interventions, e.g. changing climates in light of atmosphere composition) should not be overlooked for consideration of the social, logistical, and technological elements of the project. It is not my intention to provide unambiguous definitions for restoration projects, only heuristics with which to examine the bulk of cases.

Intensity

Similar to considerations of duration are those of intensity. Intensity, however, reflects the magnitude of intervention at any given time rather than the ratio of time spent intervening to the total time to objective satisfaction. For example, restoring forest ecosystems on vacant agricultural land requires high intensity interventions in order to sufficiently change the landscape to foster the growth of mature trees and to plant the saplings necessary for this. However, this may not require a long duration of intervention as the large-magnitude intervention at the outset of the project, in combination with the time required for forest maturation, may remove need for consistent, long-term intervention. Conversely, reclaiming grasslands may take intensive intervention for a continued duration given the fragility of these ecosystems.

Methods

The last broad dimension to recognize in this brief examination is that of methods. It is difficult to detect whether the method of restoration is prior to the form the restoration takes or whether the form of the restoration demands and constrains the methods that are used for the restoration effort. In either case, the methods that are used are critical in determining the intervention strategies that are required for meeting restoration objectives. Pleistocene re-wilding, for example, requires the reintroduction of mega-fauna to ecosystems that have developed without them. In this case, introducing new species to an ecosystem (the method) will require intensive intervention in constructing infrastructure (e.g. fences) and in developing those components of the local ecosystems that are necessary to support mega-fauna. In contrast, passive restoration such as those cases where the duration of intervention approaches zero will not, by definition, require methodological intervention.

As noted above, the three dimensions of duration, intensity, and methods are not meant to be exhaustive of the potential aspects of intervention that are relevant to restoration projects. They do, however, provide a general heuristic to consider the social, logistical, and technological aspects of extreme rewilding efforts with respect to their intervention strategies and consequences.

The Social, Logistical, and Technological Elements of Pleistocene Rewilding

As suggested above, consideration of intervention strategies – specifically, their duration, intensity, and methodologies – provides a novel heuristic to view the social, logistical, and technological elements of restoration efforts. Given that restoration efforts vary wildly in their objectives (i.e. benchmarks) and strategies (i.e. interventions), it is beyond the scope of this paper to consider these elements across the broad spectrum of restoration efforts. Thus, I look directly to Pleistocene rewilding as a restoration program as it answers both of our restoration questions (benchmarks and intervention strategies) in the relative extreme. Consideration of extreme examples can often help more easily identify those aspects of projects that may otherwise go unnoticed or underappreciated. As well, extreme projects may also have extreme consequences – to benefit or detriment – and so it is worth robust consideration before putting the programs into practice. As such, Pleistocene rewilding is ripe for consideration.

Social Elements of Pleistocene Rewilding

Restoration efforts of any type are necessarily social actions in virtue of the groups carrying out the efforts and those that will be impacted by the efforts, and so will have social dimensions to their programs. For this paper, I only consider the impacts of extreme restoration efforts on directly affected communities. I do not presume that this exhausts the social dimensions of these efforts, only that directly affected communities will more be more straightforwardly affected. Further research would do well to extend these considerations to a wider audience, yet that is beyond the scope of this paper.

Two salient relationships between a restoration effort and its affected community are [1] how the community *views* the restoration as a change to their landscapes and sense of place, [2] how the

community is affected by how others outside the community act toward the new landscape. These are each considered in turn.

Communities develop within their environments and with this, the community develops a specific sense of place in respect to their local environment. We would be remiss to not consider how altering a landscape – especially in extreme ways such as Pleistocene rewilding – affects the sense of place that local communities have developed over many generations. For instance, a community in the Great Plains will have developed in lieu of large vertebrates freely roaming their environments. Whereas the communities may feel a relative safety from wild nature in their current situations (excepting extreme weather events), the introduction of elephants, lions, and cheetahs may instill a fear for their environments that they have not learned to account for. Whereas their natural environments were once a place of safety and recreation, Pleistocene rewilding stands to modify these perceptions and thus modify the communities sense of place in their environments. Furthermore, the communities develop an aesthetic towards their environment that will be changed in the advent of ecosystems capable of supporting large vertebrate populations. How the environments is viewed, sensed, and seen – literally – will be changed in rewilding efforts. Both sense of place and aesthetic changes may not be problematic for local communities, but they should be considered at a minimum.

Different intervention strategies will have differential impacts on these two dimensions of a community's perception of their environments. Especially in cases of rewilding where the introduction of large carnivores is prescribed, length of intervention durations may correlate with a sense of safety in the local communities and may in fact be necessary as a precautionary measure to ensure their safety. It may be the long-term objective to have the restored ecosystem operate autonomically and without any intervention from restoration personnel, but personnel may need to be present much longer than anticipated until affected communities develop new relationships with their new environments. Restoration personnel, in this way, can act as a symbolic protection against the new environments.

Restoring a landscape such as the Great Plains to an ecosystem capable of supporting large vertebrates will require many changes in relatively short periods. For example, it is implausible to 'ease into' the introduction of elephants to the Great Plains. In a very literal way, one day they will not be there and the next day they will. Pleistocene rewilding efforts will require periods of high-intensity interventions – such as the introduction of elephants – which will greatly change the aesthetics of a landscape over a relatively short time. This may be the nature of the beast, but consideration of the impacts to affected communities sense of place and developed aesthetic relationships is warranted. The Oostvaardersplassen Reserve described above introduced herds of [cows?] to the reserve, without consideration that herd mortality demanded a much different aesthetic experience then the affected communities had developed (cite). Over winter, many of the [cows?] died near the edge of the reserve within visible sight of local communities, and their corpses were left to provide for the scavenging species that had been introduced to the reserve reflecting the non-interventionist strategies of rewilding. Local communities, however, were appalled by the grisly scenes of scavenging [vultures?] tearing at corpses. The restoration project was forced to [what did they do?]. These situations impact the aesthetic experiences of affected

communities and could serve to either drive support for the projects (assuming positive aesthetic experiences) or serve to hinder support. Had the Oostvaardersplassen Reserve planned on a longer duration of intervention and made attempts to reduce the intensity of the restoration project (seen here as a large magnitude in the change of the aesthetic experience over a very short time period), the local communities would have had time to develop new relationships with the reserve that respected the wildness of the reserve.

In both cases of modifying a communities' sense of place and their aesthetic relationships with their landscapes, special attention should be paid to the methodologies of intervention. It may be a sufficient methodology for Pleistocene rewilding practitioners to introduce large vertebrates to a landscape without consideration of local communities, but engaging these communities in the introductions *before* the animals are introduced will allow the communities to confront the changes to their sense of place, develop new aesthetic relationships, and acclimate to a new landscape. Furthermore, this an engagement methodology will allow restoration practitioners to anticipate conflicts with local communities as well as potential undiagnosed obstacles to the introduction of the species. Aside from engagement methodologies, considering the methods of introduction can help to alleviate community affects. For instance, if a specific landscape currently has no trees yet trees must be introduced for restoration objectives, then it may be worth extending intervention duration by planting smaller trees that will require care over a longer period of time rather than planting mature trees that may require a smaller duration of intervention by substituting a great intensity of change. This is only example, but serves to show how consideration of intervention methodologies, intensities, and durations can affect the perspectives of local communities.

Lastly, novel landscapes will draw attention from persons outside the community. If elephants are introduced to the Great Plains, for example, there will assuredly be an influx of tourists and the industry that supports them. Small local communities may not have the capital to develop tourism industries and so it is likely that externally funded businesses will quickly economize on new opportunities. This could be a great boon for local communities, but it could also put those communities in powerless positions that must quickly respond to economic changes that are beyond their control. Again, the intensity, duration, and methodologies of intervention strategies in these extreme restoration efforts will impact the relationships that external persons have with local landscapes. It is conceivable that the same long-duration, low-intensity methodologies that can help local communities in their own relationships to the new landscapes will also help to develop external relationships in a more considered manner that respects the local communities directly impacted by the restoration efforts.

By no means do I consider this an exhaustive consideration of the social impacts on local affected communities, but I do offer this brief analysis as an example of how respect for intervention strategies can differentially impact the relationships on the local and external communities of restoration efforts. An added benefit to recognizing the impact of intervention strategies, parsed as I have, is that empirical science can develop around understanding just how different intervention elements impact different communities. As more restoration efforts consider and chart their intervention strategies, we are able to build a literature that can be

appealed to when considering future restoration efforts, especially with respect to the social dimensions of these efforts.

Logistical Elements of Pleistocene Rewilding

Restoration efforts – extreme or otherwise – are constrained by the logistical capacities of the project. This constraints are most generally budget, personnel, or time constraints, yet they are not limited to these. Local ordinances and regulations may demand or prevent certain restoration efforts which, although best described as 'logistical' within the scope of this paper, is far beyond the scope of this paper to consider. For my purposes, it is enough to illustrate the impacts of intervention strategies with respect to the capabilities and capacities of restoration practitioners and environmental engineers.

Pleistocene rewilding is likely to be resource intensive, drawing on the capacities of practitioners to organize the knowledge necessary for the efforts, the resources to obtain the extant species for the project, and the labor to implement and manage the restoration. If not fully considered at the outset of the project, any of these three constraints (along with a multitude of others not discussed here) stand to derail the project, forcing decision-makers to accept less than desirable outcomes. In milder restoration efforts falling short of ideal objectives may be acceptable, yet there will be definite – and resource-extensive – success conditions for Pleistocene rewilding, minimally seen as the continued safety of surrounding communities and ecosystems. Therefore, understanding the impact of a determined intervention strategy on logistical elements is critical to the long-term success of extreme restoration efforts.

Logistically, rewilding restorations are attractive in the sense that the brunt of the effort occurs at the onset of the project and, ideally, is quickly diminished as the ecosystem gains self-regulating autonomy. These high-intensity, low-duration projects stand to be more easily funded as they don't require long-term commitments and can promise drastic changes in short times. Simply, funders can see in a relatively short timeframe what they paid for. It should be recognized, though, that there is considerable risk in projecting low-duration efforts in the case of Pleistocene rewilding. Given the species being introduced and the uncertainties in how the ecosystems will develop, it is unlikely that these projects will actually be low-duration. In fact, it is very plausible that these efforts will require high-intensity intervention over long durations as the novel ecosystems develop and as the social systems – broadly recognized above – react to the project. The duration and intensities of intervention strategies are likely correlated directly with the resources required and given that resource constraints can be prevalent and tied heavily to external factors (e.g. political cycles, economic health), these need to be considered in the early stages of the project, especially in light of social impacts.

The realities of resource constraints are powerful factors in decision-making. Although all restoration projects will need to grapple with resource constraints, it is worth considering the logistical elements of rewilding intervention strategies in a world without resource constraint. Perhaps an ideal rewilding project would require high intensity interventions early in the project, followed by periods of lessening intensity interventions over time until, eventually, the ecosystem and surrounding social systems did not require interventions at all. During the

restoration process, decisions must be made regarding infrastructure including roads (Do we redirect existing roads around the restoration area? Do we build new roads through the area?), fences (Do we build fences to keep large vertebrates within the area? Do we build fences to keep unwanted visitors out of the area? How are the objectives of the project – aesthetic, ecosystem health, etc. – helped or hindered by impermeable barriers?), and utilities infrastructure that is likely currently developed in the area (What do we do with power lines, pipelines, and subsurface utilities?). If, for instance, it is decided to remove all roads and utilities from an area so as to rewild it in the deepest sense, then it may be difficult to rally support behind the project as it will heavily impact the surrounding area in ways that may not obviously offer commensurate support. In this case, the high intensity intervention – seen as the removal of all human development from an area – has a high impact on the surrounding area. Extreme restoration efforts need to remember not to only focus internally toward the novel ecosystem without concern for the impact of the effort on the rest of the landscape.

It is worth considering the specific impact of roads and fences on the social fabric of a landscape. Roads and fences structure, in a very literal way, the way that people interact with a landscape. Fences can be permeable or impermeable by people, depending on their purpose, serving to both direct humans interaction with the landscape and acting as a symbol of how people are expected to act on the landscape. For instance, a Pleistocene rewilding project may construct large, impermeable fences in order to guarantee the safety of adjacent communities. Although these fences have very practical value, they also stand to most literally keep people out of the landscape. Symbolically, they also suggest that people no longer belong on that landscape. Given that local communities have developed relationships with their landscapes, it should not be assumed that a fence – however beneficial to the community – will have no social impact. Roads, similarly, structure our movements through a landscape. As Marcuse (x) recognizes, "the countryside is shaped and organized by the highway…signs and posters tell the traveler what to do and think; they even request his attention to the beauties of nature or the hallmarks of history" (p. 143). The ways in which roads carve up a landscape most literally construct a person's experience of that landscape. Changes to pre-existing roads will therefore change the experiences of those communities whose experiences were previously structured by the pre-existing roads. Furthermore, new roads and byways will structure the experiences of newly-attracted visitors. Given the probable influx of tourists to a Pleistocene rewilding, the ability of the infrastructure to impact experience should not be taken lightly. These considerations, although initially demanded as logistical, affect the social fabric of the restoration and thus require consideration beyond that required for developing an autonomic ecosystem.

Put simply, logistical constraints are those that grow from the on-the-ground development of the restoration effort. While it is true that the agreed upon historical benchmark of a project will impact the logistics of that project – such as allowing utilities for some projects while not others – paying special attention to the prescribed intensity, duration, and methods of intervention will bring into clearer focus any constraints facing the project. It should not be assumed that logistical constraints do not impact surrounding communities. If the project funding demands high-intensity, low-duration interventions and/or infrastructure changes that construct human

experience on the landscape, then effort should be made to engage local communities in light of the quickly changing relationships they will have with the landscape, as discussed above.

Scientific and Technological Elements of Pleistocene Rewilding

There are many restoration projects that occur without scientific advice or technological apparatus such as a farmer letting their land lie fallow (this example may be, in fact, a technological contrivance, yet it still serves these purposes). Most restoration efforts, however, rely heavily on scientific knowledges and technological machinery in order to realize. The traditional *modus operandi* of restoration efforts is to first decided on a benchmark, as recognized in our first question of restoration, then appeal to the relevant sciences to describe where the landscape currently is and what is needed to develop it toward the benchmark. This is not necessarily problematic, but we would do well to consider how this standard practice operates on the social fabric of affected communities, especially within the context of extreme restoration projects. As with the previous discussions, the topic of the scientific and technological elements of restoration, specifically their impacts on affected communities, has been broadly considered (cite). Here, I consider how particular intervention strategies put demands on the scientific knowledge and technological apparatus of a restoration project, and how these demands set the stage for differential impacts on affected communities.

First, deliberate restoration efforts require, almost necessarily, scientific knowledge. This could be primary knowledge as in scientists being asked to directly participate in the effort, or this could be secondary as in referencing scientific findings in developing the effort. Either way, scientific knowledge is being used and the impact of its role should be discussed. Given that Pleistocene rewilding requires knowledge of historic ecosystems, current environmental states, and general ecosystem knowledge, it is obvious that science plays a crucial role. Pleistocene rewilding is at an even larger disadvantage over many restoration efforts in that it is near impossible to definitively understand pre-human, extinct ecosystems to the degree that we understand contemporary ecosystems. Furthermore, many of the species that were part of Pleistocene ecosystems have long since gone extinct, so any restoration project will require the substitution of species that serve the same function in ecosystems as those they are replacing.

These facts render decision-making regarding Pleistocene ecosystems uncertain, at best. Environmental governance is not unaccustomed to scientific uncertainty, yet the interplay between uncertainty and decision-making has potentially deleterious impacts on affected communities. If a restoration project proceeds on a high-intensity, low-duration model as may be required by funding sources and philosophical commitments to autonomic ecosystem self-regulation, then we risk *over-determining*, scientifically, our landscape. Given that Pleistocene rewilding is already undergirded by considerable uncertainty, then the pressure to make large changes to a landscape in a relatively short time frame (high intensity, low duration) puts pressure on practitioners to rely on known variables that, themselves, have higher degrees of certainty. These scenarios lead toward a stable, autonomic ecosystem that can be characterized as more constructed than organic. This means that the final product will be a constructed product of the initial conditions, developing as planned with low-risk decisions and along more certain pathways. This conservative approach – meaning a reliance on high-certainty, controlled

scenarios – constructs a landscape in ways that stand to not be truly wild or natural (constructed development versus organic development), to be directed toward specific interests (whose interests does the restoration project serve?), and may only reflect current ecosystems and not the novel autonomic ecosystems that were strived for. Simply, by managing our scientific uncertainty in particular intervention strategies allow for an organic, autonomic ecosystem or does it promote a constructed landscape? Each of these – including the range of ecosystems between them – will differentially impact their local communities and will attract (or deter) potential tourists, and with them the industries that will support them.

Rewilding, as a restoration project, calls for short duration intervention strategies in order to allow the novel ecosystem to develop organically. Thus, there is a potential contradiction in 'rewilding' if we are restoring toward a specific objective from the outset of the project (our defined benchmark). How do we guarantee a Pleistocene ecosystem while letting the ecosystem develop organically? If extant species are not able to thrive in the new system, for reasons unknown, then are we required to let them go extinct? It is implausible that project managers would allow some introduced species to go extinct in the new ecosystem. Failing elephant populations, for example, would likely require intervention to diagnose a problem and influence its solution. This example is not meant to indicate when intervention is (or is not) appropriate, but instead to illustrate how a society can come to behave towards the novel ecosystem depending on how the ecosystem is developed and constructed. If the ecosystem is allowed, from the outset, to develop organically and with special attention paid to a non-interventionist strategy, then it is fundamentally acceptable to refrain from intervention. If, on the other hand, the ecosystem is constructed with very controlled, high-certainty methods, then intervention is more palpable as the resulting ecosystem is seen as a product-of-man, and not a product-of-nature. This is not itself problematic, but the impact on local communities may be. Large vertebrates, including elephants and lions, are characterized as charismatic mega-fauna, citing a disproportionate propensity to garner affection and care for their well-being versus those species who are not as recognizable. These species can be used to gather support for restoration projects, but there is an inherent risk is their introduction: How will affected communities react to failing elephant populations?

Questions of how we intervene in a landscape (methods), for how long (duration), and at what level (intensity) are in some part a reflection of the scientific knowledge we possess regarding the project and the technology that we use to realize the project. Balancing uncertainty with the prerogatives of the project, operationalized as an intervention strategy, allows the resulting ecosystem to be seen as more constructed or more organic. These may not be mutually exclusive. We do need, however, to better understand how differential intervention strategies produce different ecosystems, and how these are perceived and acted upon by the affected communities. It should not be assumed that communities will positively react to novel ecosystems, regardless of how they are developed.

Stepping Back: Taking an Anticipatory Stance

It is not that we know which decisions to make when developing restoration efforts – they will be decided by context. This paper ultimately asks us to consider and anticipate, beforehand, the

impacts of our decisions on the social fabric of affected communities. Restoration efforts are not only internally directed, meaning that success conditions are not only derived from the success of the developed ecosystems. In developing an anticipatory stance towards restoration, I argue that success conditions also take into account external impact. External impact, as discussed previously, is often more difficult to recognize and can seem slippery to measure. To this end, I suggest that operationalizing intervention strategies may help to provide explanans for social impact. By recognizing the social dimensions to restoration efforts, and how they are impacted by the [?], logistical, scientific, and technologic elements to the effort with respect to the intervention strategy, we are better able to take an anticipatory stance toward the effort. Ultimately, I argue that anticipatory and aspirational objectives should be aimed for, considering a fuller range of consequences rather than merely ecosystematic relations. After all, we are in the Anthropocene and it is no longer sufficient to consider the natural environment apart from the impacts of human development.

Conclusion

Restoration efforts, in general, face two underlying questions that serve to guide the process and objectives of the effort: To which historical benchmark should we restore? and What is the appropriate level of intervention in satisfying this benchmark? In this paper, I have developed an account of intervention strategies that I argue underlies differential impacts on affected communities. This account of intervention strategies – seen as the degree of intensity, the length of duration, and the accepted methodologies of intervention – helps to illuminate the impacts of community relationships, logistical constraints, and scientific and technological decision-making on affected communities. By considering the impact of intervention strategies on the social fabric of affected communities in the context of Pleistocene rewilding, I aim to develop an account of restoration efforts that can help to better anticipate beforehand the social consequences of those efforts and prompt empirical investigation into the impacts of diverse restoration efforts.

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