

Human and Non-Human Migration: Understanding Species Introduction and Translocation through Migration Ethics

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ABSTRACT

Despite the propensity of species introductions to disrupt ecosystems through community disassembly, the use of species translocations is becoming more widely accepted. In this paper, we examine ethical investigations into human migration in an attempt to evaluate how translocation may be justified. Previous attempts to make the analogy between human and species migration have been prone to black and white thinking. We argue that the disagreement between nativist and cosmopolitan approaches to introduced species can be defused by extending the analogy through the migration ethics literature. Additionally, by extending the discussion to the special status of refugees, we are able to develop a theoretical framework for species migrations that acknowledges the risk of species introduction while recognising that special obligations towards endangered species may necessitate the use of translocations.

KEYWORDS

Translocation, species introduction, assisted migration

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1. INTRODUCTION

Species introductions can decimate ecosystems through extinctions and community disassembly (Simberloff, 2006; Zavaleta et al., 2009). Despite the propensity of introduced species to harm ecosystems, translocation is widely used as a management technique (Fischer and Lindenmayer, 2000). The movement of an endangered species from one location to another seems to present the risk of introducing a foreign species into an ecosystem that may become invasive, and yet the acceptance of the technique suggests that endangered species are a unique case, which necessitates special treatment. Despite controversial discussions over the appropriateness of the use of translocations (Ricciardi and Simberloff, 2009), we believe that justifications for the special treatment of endangered species within the broad category of introduced species have not been fully articulated. We believe that by expanding the analogy between human migration and species migration, and specifically looking to the discussion of refugees, we can develop an understanding of why species translocations may be justifiable.

The analogy between human and species migration has been made before, but none that have considered it have looked explicitly to the migration ethics literature. Instead, the connection between species and human migration has been a point of major contention, with a dichotomous divide between those who argue for ‘nativist’ policies towards introduced species, excluding them in order to protect native biodiversity, and those who have argued for a ‘cosmopolitan’ viewpoint, which emphasises the acceptance of species into novel ecosystems. We believe that this tension is in part due to not making note of the complexity of the case of human migration, and that exploring migration ethics literature can help to provide a more realistic picture of what the analogy is capable of providing.

The similarities between the two cases are certainly notable, and we understand why the analogy has been considered useful in past discussions of how to deal with introduced species. The debate in both areas is fundamentally about how to treat groups that have moved into a community of which they are not historically a part, especially if their behaviours may antagonise native groups. For example, the crayfish *Pacifastacus leniusculus* shows aggressive behaviour that displaces native species in Japan (Usio, Konishi, and Kakano, 2001) and Europe (Vorburger and Ribi, 1999). More pertinent to understanding the analogy, this same species shows less aggressive behaviour in its native range where a native congener resides (Pintor, Sih, and Bauer, 2008) and therefore the animals modulate their individual behaviours to create group cultures based on the conspecific groups where they live. In higher order taxa, groups of cetaceans form their own cultures and languages, dubbed ‘horizontal’ cultures, allowing some cetaceans to adapt and exploit anthropogenic influences in the seas (Whitehead et al., 2004). Regardless of the receiving community

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being a state or an ecosystem, the potential for non-natives to affect community integrity is a concern, and a suite of policies and laws to control the actions of non-native humans and species has emerged (Simberloff, 2003). Indeed, even the concept of ‘naturalisation’ in law and policy rhetoric for invasive species and immigrants is similar, where ‘A species that enters the country for the first time is called an “alien” or an “exotic” species; after an unspecified passage of time they are considered residents; after a greater unspecified passage of time they are considered naturalised species’ (Subramaniam, 2001: 27).

Before determining what human migration ethics can mean in the specific case of translocations, we believe it is necessary to elaborate upon what it can tell us about species introductions generally. We begin by discussing the literature that has previously addressed the analogy between human and non-human migration, arguing that an explicit exploration into the migration ethics literature may prove useful for defusing the tension between the nativist and cosmopolitan viewpoints. We then move to the implications for introduced species of liberal egalitarian arguments that argue for reducing restrictions on immigration, followed by a discussion of the more restrictive nationalism argument of David Miller. An examination of the two divergent arguments leads to the same conclusion; while introduced species should not be treated as inherently negative based on their non-native status alone, their propensity for causing ecosystem destruction means caution must be taken when dealing with them. We follow this with a discussion of non-ideal and pragmatic approaches in both human migration theory and in the environmental context, arguing that just as the complexities of immigration mean comprehensive arguments may be unappealing, the case of species introductions similarly requires a context specific approach. Finally, we move to an investigation into the specific case of translocations, and argue that in the same way theories of immigration recognise obligations to groups and individuals that are most at risk, endangered species can be considered a ‘refugee’ class of species, requiring more aggressive management.

2. ANALOGIES AND DIS-ANALOGIES IN MIGRATION

As noted, the analogy linking human migration and species introduction has been a major point of contention within the invasion and restoration literatures. Restoration ecologists who focus on the removal of introduced species have been heavily criticised for their characterisation of them as ‘alien’, ‘exotic’ and ‘invasive’, and for the often nativist rhetoric of their work, which many point to as echoing anti-immigrant rhetoric. Notably, some have recognised commonalities in the discussion of the sexual activity of both human and non-human migrants, as well as their ability to encroach upon the stable communities of the ‘innocent’ natives (Sagoff, 2005; Subramaniam, 2001; O’Brien, 2006).

In response to criticisms, some have attempted to reorient their positions against introduced species as being motivated not by hatred of the species, but rather as being the product of a desire to preserve communities. William Jordan (1994), in his defence of the view that restoration requires the exclusion and elimination of certain exotic species, argued that certain ecosystems require preservation, and that the removal of novel species is more about the preservation and protection of threatened ecosystems, rather than hatred of foreign species. He makes the case that rather than having commonalities with the exclusionary Nazi regime, whose goals were unambiguously evil, restoration programmes share more in common with the creation of the state of Israel, which was not created explicitly for exclusion, but rather the survival of the Jewish people. Ned Hettinger (2001) also argues that the desire to prevent the entry of foreign influence into a community is not always considered undesirable and xenophobic, noting that we often value the preservation of indigenous peoples and cultures, and may favour these peoples over outsiders in order to facilitate their protection. In a similar way, he argues that we want to protect biodiversity in a world that it is increasingly threatened.

In contrast, those defending introduced species from potential removals have embraced something of a 'cosmopolitan' view of introduction, and argue that just as a cosmopolitan conception of human immigration means accepting foreigners into our societies, we should learn to accept introduced species into ecosystems (O'Brien, 2006; Sagoff, 2005; Soulé, 1990). Rather than focusing attention on the elimination and removal of introduced species, they argue, we should instead embrace ideas that promote opportunities for the blending of species within ecosystems.

While we argue that this analogy between human migration and species introduction can indeed prove useful for illuminating aspects of the conservation debate, we believe that some of the dis-analogies between the two cases need to be acknowledged before further discussion can take place. We believe that three differences between the case of human migration and non-human species introduction warrant mention here.

The first thing to consider is that while an argument can be crafted that introduced species should not be considered inherently negative because of their non-native status, this is not an argument for the rights of individuals of a species. Conversely, arguments for the human right to movement are generally crafted around individual rights to movement. Put more simply, and perhaps controversially, is that when it comes to immigration policy, even in the most communitarian or nationalistic arguments, the rights of individuals are considered in addition to group rights, while in conservation, the units of analysis are genes, species and ecosystems, rather than individual animals directly. This does not mean that the pain and suffering of individual animals should not be considered. To attenuate the unnecessary suffering of individual animals is in fact the goal of most Institutional Care and Use Committees housed within

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individual institutions, and approval for the funding of conservation projects is generally tied to meeting these goals (Gordon, 1999). Many animal ethicists would challenge the legitimacy of this claim, most notably Peter Singer (2003), who is less concerned with species survival than the ethical treatment of individual animals. A full discussion of the commitment to individual animals in species introductions is outside the bounds of this paper, and certainly it is a discussion worth having¹, but we acknowledge that any ethical theory of conservation would aim to avoid the unnecessary suffering and death of individual animals due to human negligence. Still, the focus in conservation is not on individuals, but rather genes, species and ecosystems.

The second major difference we should acknowledge when considering the analogy between human and non-human migration is the scale of movement that it takes to see a significant impact on the receiving community. Even the biggest proponents of open borders understand the need for stricter immigration policy if the immigration would lead to negative impacts on the receiving state, but it is unlikely that they would consider the possibility that just a few immigrants could cause the complete upheaval of a liberal state. Alternatively, in the case of species migration, a small population of a species can certainly have a large effect on an ecosystem. The impact of a species translocation could threaten native species within the host system, upsetting the balance of the ecosystem. The impact can happen rapidly and can be difficult to reverse (Mueller et al., 2008).

The third difference between human and species migration is the autonomy of the migrants. Human migration is most often undertaken because willing actors choose to move for any number of internally motivated reasons, the obvious exception being refugees forced to flee from their home. In contrast, while species may indeed move from one area to another without human intervention, species introductions are often directly or indirectly attributable to human actions (e.g., ballast water release). In the case of translocations, the movement of species is out of the control of the species themselves, and is undertaken solely by human actors.

While these dis-analogies may present limitations to the comparison of human migration to species introduction, we still argue for the usefulness of the analogy when it comes to the debate over introduced species. While it has its limits, metaphoric thinking is not a superficial way of looking at problems, and can provide novel ways of thinking about the natural world (Keulartz, 2007). Metaphors provide an important comprehensive link for making new contexts understandable (Chew and Laubichler, 2003). We argue that the analogy with human migration, if extended further, can allow us new perspectives into the arguments over species introduction, and importantly, can provide the foundation for a new way of conceptualising the translocation of endangered

1. See Woods and Moriarty (2001) for a discussion of how animal welfare issues were controversial in the removal of feral pigs from Hawaii.

species. We do, however, recognise the limits to this type of thinking. Where metaphors become intensified and are not carefully utilised, they become problematic (Chew and Laubichler, 2003). We would endorse the views of those who suggest that the use of multiple metaphors/analogies in conservation debates can help to defuse black and white arguments that can develop through the use of metaphors in conservation, especially in the nativism/cosmopolitan debate over introduced species (Keulartz, 2007; Keulartz and Van der Weele, 2008). Still, while we believe the multi-metaphor perspective is useful, we argue that it is possible, and important, to defuse the distinctions between the two perspectives by a further elaboration of the immigration analogy itself.

The use of metaphors appears to be inescapable when it comes to making conservation decisions (Chew and Laubichler 2003; Keulartz 2007), and it appears that conflation between human migration and species introduction is especially potent. We agree with Keulartz and Van der Weele (2008), who suggest that the rhetoric surrounding the comparison has too often devolved into a dichotomous divide, with nativism on one side and cosmopolitanism on the other, with little room for a middle ground. While their application of multiple metaphors to the introduced species debate certainly helps to dissolve some of the tensions between the two sides, we believe that by extending the analogy beyond a facile discussion of human migration issues, and by looking at the actual migration ethics literature, the divide can be bridged even further, and can provide a useful framework for dealing with introduced species. Additionally, an application of migration ethics, and specifically the literature on the special case of refugees, to the case of endangered species provides a novel way of understanding species translocations as a unique form of species introductions.

3. OPEN BORDERS, LIBERALISM AND LIMITS TO MOVEMENT

Liberal arguments for open borders policy in human migration have been among the most influential, and these arguments are especially relevant to the case of species migrations. Liberal defences of free movement rely on the idea that guaranteed rights to free movement are required for the equal moral treatment of individuals, and that impediments to movement via strict immigration policy is an affront against human rights (Carens, 1992). If movement is a human right, then immigrants must be treated in a neutral way. This being the case, policies that treat immigrants differently than natives based solely on their non-native status should be opposed. Similar arguments for the neutral treatment of introduced species frame the animal right to movement around the naturalness of species movement. Further inquiry into what the application of a liberal framework means for species migration is, however, necessary.

The most ardent defender of the liberal egalitarian point of view is Joseph Carens (1992), who suggests that morally arbitrary criteria (i.e., place of birth)

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should not be considered when it comes to immigration policy. While one's place of birth is important for community ties, this does not limit one's freedom to change membership. Chandran Kukathas (2002) suggests the starting point for any theory of migration should be the principle of free movement of individuals. Like Carens, he argues that the place of birth for humans is purely arbitrary, and borders that keep humans apart are similarly arbitrary. Bruce Ackerman (1980) also defends a liberal principle that supports more open borders, suggesting that if one is able to neutrally justify their right to liberal citizenship against the claims of others, they should be granted citizenship. Therefore, if there is not a legitimate and neutrally justifiable reason for exclusion, anyone seeking membership in a community should be allowed to enter. By such logic, the location of humans should not matter, as humans have an inherent right to movement.

As noted, similar arguments have been made in the case of introduced species. Daniel Botkin (2001) argues that the naturalness of invasion implies invasive species should not be considered worse than any other species simply because of their non-native status. While he does not make an argument based around human migration rights, the idea that invasive species should not be judged based on the non-native characterisation of the species alone and that species should have the ability to move freely and be accepted across ecosystems is an idea that would accord well with liberal theories. In much the same way that liberal theorists argue that contingent qualities like place of birth should not be used to judge individuals seeking migration, Botkin argues that a species should not be judged on the fact that it is not naturally a part of an ecosystem, as ecosystems are constantly changing assemblages of species.

Mark Sagoff (2005) also notes that invasion has historically been a part of the world, and that the negative attitudes towards it are not necessarily justifiable. His argument, however, differs from Botkin's, as he argues that historically, invasive species were purposefully brought into new areas, and 'considered an unmitigated good' (2005: 216). Sagoff explicitly notes that a liberal view of immigration policy assumes individuals have no deleterious impact on a receiving country simply because they are foreign, and similarly, invasive species should not be discriminated against based on their exotic origin. While we argue that introduced species often do cause harm, which is against one of Sagoff's main contentions, we agree with him that when considering invasive species to be harmful, it should have to do with their actual impact, and not simply the fact that they are not native to the biological community.

Michael Soulé (1990) introduced a perspective on alien species that would accord well with many liberal theorists, arguing that we should take a cosmopolitan approach. Indeed, his language seems to almost mirror those of the liberals, when he states, 'the collection of species that exist in a particular place is a matter of historical accident and species-specific autecological requirements' (Soulé 1990: 234). Especially given the growing number of

introductions caused by human interaction and climate change, Soulé suggests that practical and ethical defences of the outright preservation of the ecological status quo are becoming more and more difficult. For Soulé, it seems, the currently existing biotic 'communities' are as morally arbitrary as the currently existing distribution of humans is for the liberal egalitarians like Carens.

Still, liberal arguments for open borders do recognise that migration can be restricted due to negative impacts caused by the influx of a large number of immigrants, an important aspect of the liberal framework for human movement. Carens, who is the most consistently liberal supporter of open borders, notes that migration may indeed be restricted in the extreme cases where receiving countries are adversely affected. Where liberty and equality may be undermined, or where a distinct way of life is legitimately threatened, Carens (1992) grants that some restrictions on migration may be justified, although he considers restrictions as rare interventions. Kukathas (2002) also recognises that any immigration policy must make note of the possible economic, ethnic and religious unrest that could be caused by a critical mass of immigrants entering the country. Similarly, Ackerman (1980) acknowledges that there may be a number of reasons to potentially restrict membership and movement. If a person can be shown to disrupt the functioning of liberal society, they lose many of their rights to movement. For example, if a person has a clear tendency towards murderous behaviour, their movement may be restricted within a liberal state. On a larger scale, Ackerman suggests, 'the only reason for restricting immigration is to protect the ongoing process of liberal conversation' (1980: 95). This implies that if a large enough mass of immigrants from an illiberal country were to desire to migrate to a liberal democratic state, the state may be required to limit the immigration in order to preserve its liberal standing. Even those who are in favour of more open immigration policies recognise that if the entry of migrants disrupts the functioning of society, limits may be justified.

Introduced species should not be considered harmful simply based on their non-native status, but they often do negatively affect the native biodiversity of the ecosystems that they are newly a part of (Larson, 2005). The homogenising effects of expanding species on native biological communities are also well documented (McKinney and Lockwood, 1999; Olden et al., 2004). While we agree with what could be considered a 'liberal' view towards invasive species, i.e., that they should not be judged based on arbitrary considerations, liberal arguments for open borders suggest that limitations can be placed on immigration if the costs are severe. Thus, a liberal framework would support the principle suggested by Botkin and Sagoff – that species should be judged based on their impact, rather than their status as native or introduced, but would recognise limits to species migration based on the harm that introduced species can cause. In cases where the introduced species do not seem to affect native biodiversity, perhaps where there are natural checks and balances, it may be justifiable to leave them alone and even use those species for their economic or

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natural qualities (Schlaepfer et al., 2011). Liberal egalitarianism requires social goods to be distributed based on things other than morally arbitrary criteria like birth, race and class (Carens, 1992); a treatment of introduced species based on liberal principles requires that species should be judged on their impact, rather than their non-native status. Indeed, even Soulé (1990), who supports the idea of a cosmopolitan approach to species in novel ecosystems, recognises that this is conditional on them not causing a great amount of harm. While he argues against a blanket policy of opposition to introduced species, he acknowledges that this does not include species that threaten native species and whole biotic communities, or could cause harm to humans. We would argue that a position on species introduction that follows from liberal egalitarian views of human migration would closely approximate Soulé's position, positing an 'open borders' perspective, but conditional on novel species not negatively impacting native species and communities.

Additionally, while species movement may occur naturally, we do not agree that this leads to the conclusion that any particular species movement should be accepted outright. Invasion may occur naturally, but this does not suggest that anthropogenic introduction is natural. The current rate of total species movements exceeds anything that could be considered natural (Lodge and Shrader-Frechette, 2003). It may be the case that we could consider certain invasions as natural because of the time period that they occurred. For example, one natural baseline for species introductions could be species introduced before the intersection between European and American peoples (Donlan et al., 2006). Indeed, the policy of the National Park Service has special provisions for the protection of species introduced by indigenous peoples (Botkin, 2001). Given the nature of anthropogenic disruption and growing threat of climate change, however, it may be difficult to determine what species introductions are 'natural', or even to develop a consistent definition (Woods and Moriarty, 2001). Botkin (2001) may be right that there is nothing inherently negative about introduced species, because a binary native or non-native label can be difficult to define, but human-mediated species movements occur extensively as a part of increased globalisation and many species movements are not within the capacity of the species naturally. With this in mind, any normative appeal to the naturalness of invasion is difficult to apply as a conservation principle.

We should at this point again make note of the second major difference between the cases of human and species migrations if we are to consider the implications of liberal egalitarian arguments for our considerations of introduced species. Liberal thinkers like Carens suggest that while limits to immigration may be justified in rare cases, the vast majority of the time, immigration will not be at a large enough scale to have a negative impact on the receiving country. To them, the idea of a critical mass of migrants large enough to cause these issues seems to be more of a hypothetical fear than an empirical reality. It is highly unlikely that just a few more immigrants would drastically

alter the political or cultural makeup of a country, but the introduction of just a few members of a species can lead to community disassembly and species extinctions (Simberloff, 2006; Zavaleta et al., 2009). Therefore, the application of liberal egalitarian immigration theory to species migrations does not necessarily lead to the equivalent of an 'open borders policy'; when it comes to invasive species, the potential for ecosystem upheaval is a reality. For this reason, we believe greater caution must be taken when it comes to species introductions than human migrants. Their potential for disruption of native species and communities means a stricter standard of control may be necessary than those suggested by liberal egalitarians.

4. NATIONALISM, COMMUNITY AND INTRODUCED SPECIES

Having examined what an application of liberal egalitarian arguments for more open borders could mean for species migrations, we now turn to the more restrictive nationalist argument. Those who have criticised the nativist rhetoric linking introduced species and human migration previously would likely discount the relevance of principles based around nationalism. A number of arguments have compared the treatment of introduced species to the xenophobic treatment of immigrants. Banu Subramaniam (2001) has noted that a number of parallels exist between the rhetoric surrounding invasive species and the fear of immigrants, focusing on six different ways in which the language used approximates each other. She argues that the rhetoric involving invasive species and immigrants often refers to both groups as alien, suggesting they will take over everything in the receiving area. Furthermore, they are referred to as a growing threat, difficult to destroy and aggressive predators and pests. Jonah Peretti (1998: 188) claims the similar rhetoric is driven in large part by the association of biological nativism with fascist and apartheid cultures. He suggests that Nazis in Germany and apartheid supporters in South Africa were both driven to separate the 'pure from the unpure', and this motivated their nativist beliefs about the inherent goodness of native species. Similarly, Paul Gobster (2005: 264) suggests that the current aversion to invasive species is due to a 'growing culture of fear', which is related to the 9/11 attacks and the growing threat of bioterrorism. Arguments such as these would be concerned with any argument that considers the treatment of introduced species based on theories of nationalism, almost certainly linking them to xenophobia.

While we do not deny that xenophobic attitudes towards invasive species may reinforce negative views towards minorities within a country, and that such a characterisation is indefensible, it is possible to make the case that the protection of a native biological community is not necessarily as wrong as has been suggested (Heppes and McFadden, 1987). The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),

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the Endangered Species Act (ESA) and international agreements to preserve biodiversity heritage necessarily suppose that there are taxa that belong to some areas but not others. Biological diversity of an area, its fauna and flora, has persisted but also changes over time (Terborgh, 1974). Nationalism can extend to pride in the natural heritage at any stage (Escobar, 1998). This is more in line with the arguments of Hettinger (2011) and Jordan (1994), who both frame their arguments against introduced species as being motivated by their support of native biological communities, rather than hatred of the non-natives.

With this in mind, it is useful to look at an example of a defence of a more restrictive immigration policy, in this case the nationalism argument of David Miller. Miller suggests that the national culture of a country is an important good in itself, and a group of citizens can require immigrants to assimilate to the culture at large, and more importantly for our purposes, can restrict immigration if allowing immigrants would put the culture of the receiving state at risks (Miller, 2007). Miller argues that because the act of immigration is a quasi-contract between the entering immigrants and the receiving nation, immigrants have an obligation to acculturate themselves to the receiving nation (Miller, 2008). This means that immigrants must make an effort to learn the national language, put their children into the education system, and gain an understanding of the political and legal system. The specifics of Miller's arguments are not necessary to recite in full here, but the general principle is that if immigrants are allowed into a society, they must be willing to behave in a way that does not negatively affect the receiving community. Indeed, Miller argues that preference should be given to those migrants who are most willing to capitulate to the terms of the quasi-contract. It should be noted, however, that Miller (2007) believes that the national culture is only at risk in exceptional cases, and that while there does not exist a natural right to migration, the consideration of preserving culture is generally rare. Based on Miller's argument, could we treat invasive species as a special class of species with the intent of preserving the 'culture' of receiving ecosystems? An argument could be made that the desire to protect native species and communities against the impact of invasive species is equivalent to Miller's claim that it is necessary to protect national culture against immigrants.

The concern with introduced species is their direct links to species extinctions and community disassemblies. We would endorse the position of Daniel Simberloff (2003), who recognises that while any generic argument against invasive species is inherently xenophobic, there are legitimate reasons to oppose the introduction of species. We reject the idea that it is always xenophobic to place value on invasive species.

While preserving native biodiversity in an ecosystem can be considered a good, and the desire to protect the native biological community within an ecosystem is not inherently xenophobic, it needs to be considered whether a commitment to the native species that have helped to build an ecosystem and

to the protection of 'native' biodiversity actually necessitates a treatment of introduced species as inherently different from native species. We believe that this is not the case. The preservation of species that are native to an area does not necessitate the complete exclusion of introduced species, just as a commitment to national culture, like that suggested by Miller, does not mean the exclusion of all immigrants who are not of that culture. Just as Miller argues that immigrants who do not pose a risk to the national culture can be accepted into a country, introduced species that do not disrupt the ecosystem should not be eliminated. An application of an argument analogous to that of Miller's to species migrations would only mean that any introduced species would have to adapt to the ecosystem, and not disrupt native species. This leads to a conclusion roughly analogous to that suggested by the liberal arguments for the freedom of movement, that the acceptability of species introduction is dependent on the affect on the receiving community. No blanket statement for or against introduction can be supported.

5. NON-IDEAL THEORY AND ENVIRONMENTAL PRAGMATISM

As may be clear at this point, the extension of the analogy between species introduction and human immigration to include an analysis of migration ethics leads us to no firm conclusions about how to structure our treatment of introduced species. While our brief investigations into two opposing strands of immigration ethics led to similar conclusions, the conclusions provided only the idea that the acceptability of species introductions is highly dependent on the context in which they are taking place and, importantly, an evaluation of their potential to harm native species and ecosystems. Sometimes it may be acceptable to allow introductions to take place, and even embrace them as net benefits to the native community. At other times, however, the risks posed to native species and biotic communities may be too high, and measures to control aggressive species may be necessary. This is not the conclusion that arguments that have made use of the analogy in the past have necessarily come to. As mentioned, the analogy has usually been used to support either the nativist or cosmopolitan extreme, providing little room for middle ground (Keulartz and Van der Weele, 2008). By exploring the migration ethics literature itself, rather than relying on a facile understanding of the relevant issues involved in immigration, we believe we have provided a more realistic extension of the analogy. In fact, we would argue that the lack of a definitive answer is indicative of the complexity of human migration and species conservation, both of which require less idealised and more pragmatic approaches if practical solutions are to be attained.

While many theories of immigration rely on comprehensive and idealised views of the world to build their arguments (see Miller and Carens, Michael

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Walzer also), non-ideal theories of migration that consider the reality of the world instead of comprehensive doctrines and perfectly self-contained arguments provide a good alternative. One example of this is Lea Ypi's (2008) argument that a self-consistent argument for justice in migration, one that provides symmetrical justice for immigration and emigration, leads to conclusions that would make many uncomfortable. Instead, she suggests that we should relax the assumption that we need a just theory of migration and focus on those who are most in need, and argument that will bear further investigation. Similarly, Veit Bader (2005: 53) acknowledges that while a practical philosophical approach to migration may not be entirely satisfying, it allows for 'context-specific moral arguments'. The complexity of human migration means comprehensive views may struggle to produce a realistic way of dealing with the issue, and this is a noted problem with species conservation as well.

Conservation is an area that needs realistic strategies, and these strategies will often be context-specific. In that sense, mimicking non-ideal approaches to migration, and crafting a theory of species migration in a non-ideal way is a more practical approach, and thus more useful for developing actual management strategies. With this in mind, we would embrace the pragmatic view of environmental ethics (Minteer, 2012; Light and Katz, 1996). This type of thinking emphasises the ability to find workable solutions to environmental problems in the actual existing world, rather than clinging to dogmatic methodological and theoretical commitments (Light and Katz, 1996). Pragmatism, Minteer (2012) suggests, is about attaching beliefs to inquiry into practical consequences, rather than maintaining a commitment to foundationalist ideas of knowledge. While the nativist/cosmopolitan positions may provide cleaner conclusions, such a strong position is not able to consider the complexities that may arise in practice. The analogy with human migration ethics makes it clear just how complex the potential issues can be.

We feel that a pragmatic approach suggests that when it comes to conservation, the impact of any single species on an ecosystem should be evaluated as fairly and objectively as possible, regardless of whether it is a non-native, translocated, or a native species. What should be considered is not whether a species is 'native' to a specific ecosystem, but instead, the effect it has on that ecosystem. This means abandoning the idea of 'invasive' species altogether. There has been a large debate over the specific language of invasion, but much like the language of irregular migration (Carens' (2008) term for illegal/non-documented migrants) has become mired by prejudice, we believe that the notion of 'invasion' carries a negative stigma that does not always correlate with the impact a specific species is having on its ecosystem. Certainly there have been many attempts to generalise and objectify the language of invasion (Colautti and MacIsaac, 2004; Colautti and Richardson, 2009; Heger et al., 2013; Larson, 2007). We suggest, however, that the notion of 'invasive species' itself is problematic. What should be considered is not the origin of a

species, but its effect on the ecosystem it is a part of, and that applies to non-native, translocated, and native species alike. Woods and Moriarty (2001) have noted the issue with the definition of native and exotic species, recognising that while a species may be characterised as alien by one set of criteria, it may not be considered one under another. We would agree with their conclusion that a blanket policy using any single criteria as a 'correct' one is problematic, and that a multi-criterion point of view should be adopted

Of course, this is made in full recognition that introduced species have been shown to carry great risk, and that we should be especially cautious in our evaluations of them. Whenever possible, the unintentional anthropogenic introduction of species should be avoided. This may seem to be contradictory; however, it is not based on the inherent wrongness of the species, but instead on its potential for harm based on objective criteria. Expanding species have been shown to harm native species, have a homogenising effect on biodiversity and, in the case of disease, potentially harm human welfare. While our discussion above focused on harm to native species and ecosystems, in practice, these other considerations must also be taken into account. A theory of species management, in this case focusing on non-native species, should reflect the realities of the world, and this means the inherent risks of invasion must be taken into account.

6. REFUGEES AND ENDANGERED SPECIES

Up to this point, we have considered what a migration ethics framework means for species migrations generally. The use of translocations is a unique case of species migration that provides an interesting extension of the migration ethics framework. The translocation of a species from one area to another is one of four techniques for managing vulnerable species (Mawdsley et al., 2009). While the exact terminology used can vary, the general definition of assisted migration is, 'the intentional translocation or movement of a species outside of their historical ranges in order to mitigate actual or anticipated biodiversity losses caused by anthropogenic change' (Hewitt et al., 2011: 2562) If there is a change in an ecosystem, a species can respond in four distinct ways. A species can thrive under the new circumstances, adapt to the changing conditions, move to another location by itself, or fail to respond to the changes and go extinct (Chauvenet, 2012). If a species is unable to properly adapt to changing conditions, the relocation of the species by managers can be considered (Minteer and Collins, 2010). For example, critically endangered ground lizards were translocated to offshore islands of St. Lucia (Dickinson and Fa, 2000) and St. Croix (Fitzgerald et al., 2015) for protection from predatory non-native Indian Mongooses (Henderson, 1992). Before going into the specifics of common objections to translocations, it is interesting to think about

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the implications of the use of translocations based on our earlier discussion of introduced species. Translocated species are almost always being moved from an area where they were found historically to an area where they have not been historically located. The very act of translocation would seem to bring along with it the risk of introducing a species into an ecosystem where it will become invasive and potentially harm native species, a claim that has been made and will be discussed. Given our earlier discussion, it is useful to think about what an application of migration ethics, this time exploring the special treatment of refugees, can tell us about why such a policy may be acceptable.

The treatment of refugees is perhaps the one area in the migration debate that there exists something of a consensus. Nearly every scholar who has addressed the movement of people across borders has recognised that there is a special obligation to those who are in situations of extreme risk (Seglow, 2005). Beginning with Hannah Arendt (1967) and her concept of statelessness, it has been made clear that those who no longer have the protection of a state should be considered a special case, and that development of stateless groups is to be avoided. While the exact definition of a refugee is a controversial topic, there has been little debate that once a group of people has found itself in a circumstance where it is no longer possible to imagine a safe life in their country of origin, they are to be considered a special class of migrants.

While it will not be necessary to understand the full range of arguments about refugees and migration in order to apply them to the case of endangered species, a brief discussion of a few major contributions is appropriate. As mentioned, Arendt (1967) provides one of the most striking and well-known considerations of the importance of refugees, suggesting that when a group of people becomes stateless, they are inevitably deprived of their rights, and are vulnerable to all things, including death. This is not just a problem for the refugees, however, as the existence of stateless peoples threatens the very existence of politics. Michael Walzer (1983), who argues that communities have a right to self-determination when it comes to membership, is fairly restrictive towards immigration, yet recognises that we may owe specific duties to groups of refugees who do not have membership in any community. While Walzer's argument about the treatment of refugees mainly creates special obligations towards specific types of refugees (co-religionists, those with similar ideologies, etc.), even his theory, which is restricting towards migration, recognises the special status of the threatened. Peter and Renata Singer (2010) also recognise that countries have obligations towards the least well off, arguing that countries should accept refugees up until the point where it harms the receiving country. Any number of commentaries on the special status of refugees could be examined, but the main point we wish to address is that many theories of migration consider refugees to be a special case of migrants, and that the special nature of refugees requires we approach them differently when crafting an ethical theory of migration.

We would argue that endangered species, like refugees, constitute a threatened class of species that should be treated with special obligations. In the same way countries should have policies to help those individuals who are especially at risk, conservation strategies should prioritise species that are most at risk of extinction. Minter and Collins (2010) recognise that the problems caused by climate change and human land use are changing the strategies available to managers, and that the use of more extreme strategies may be necessary to avoid extinction. Included in these strategies is translocation. While moving species into novel environments may make some managers uncomfortable, the alternative, the relegation of species to ‘museums and zoos’, is a larger ethical burden to bear (Minter and Collins, 2010: 1804; Conde et al., 2011). When it comes to the preservation of species, it may be the case that strategies that would not be advisable under normal circumstances must be used.

We feel that the analogy between human refugees and endangered species is compelling for a number of reasons. First, as Ypi (2008) notes, a perfectly just theory of human migration may not be attainable. It should be clear that a perfect theory of species migration is not necessarily possible either. Following Ypi’s suggestion that migration theory should instead focus its attention on aiding those who are least well off, we would argue that arguments concerning species migrations should focus on those species that are most at risk. This may include adopting the practice of species translocations. Second, Arendt (1967) notes that the existence of so many refugees is a major threat to global stability, not just the groups themselves. We believe endangered species provide a similar challenge for conservation. The rising numbers of species extinctions, many of them anthropogenic in origin, provide what is possibly the greatest conservation challenge, and adopting tools and policies for protecting endangered species will go a long way towards meeting it.

Additionally, the analogy of refugees with endangered species is perhaps not even subject to the same degree of dis-analogy as the general comparison between introduced species and human migration. While many migrants voluntarily move for individualised and self-motivated reasons, this is not the case for refugees. Rather than wishing to leave for economic or family reasons, refugees are persecuted due to their membership in a political, ethnic or religious group. Refugees do not move because they wish to leave their country of origin, but rather because they face great harm if they were to stay. Similarly, endangered species, when translocated, are not moving naturally, but rather because they are at risk in their native ecosystem. The questions surrounding refugees are also not usually questions of individuals. While it is individual human rights that are being subverted, one’s status as a refugee is not about individual characteristics, but rather membership in a group. For Arendt (1967) and others, the concern with refugees is not the problem of stateless individuals, but rather stateless peoples. The problem with refugees is the threatened

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status of a group of people, not individual humans, just like the problem with endangered species is the threatened status of a species, not individual animals.

Still, it may be argued that the third dis-analogy still holds, and that the greater risk of translocated species disrupting native biodiversity may be too great to consider translocation a viable conservation practice. For this reason, some have opposed the translocation of species into novel ecosystems. This is the argument of Ricciardi and Simberloff (2009), who suggest that translocation is nothing more than a game of ecological roulette. They argue that the risk of introducing a species with a propensity to become invasive into an ecosystem outweighs the benefit of translocation. While we agree that caution should be used when attempting to move a species from one area to another, we are sympathetic to the viewpoint of Minter and Collins. As they suggest, rejecting the strategy of translocation outright is akin to capitulating to species extinction (Minter and Collins, 2010).

While caution must be used when attempting any conservation strategy, and importantly, appropriate monitoring must be in place for translocated species, the preservation of endangered species is an important goal, and any strategy that can help achieve this goal should not be dismissed. We note here, however, that strategies to rehabilitate populations *in situ* should be considered before translocation is attempted, but this may not always be possible. Translocation should be but one among many strategies to be considered. This mirrors the idea that alternative policies should be considered and attempted to help refugees within their home countries before granting asylum abroad (Shacknove, 1988). Additionally, founder population size must be large to avoid the problems associated with genetic inbreeding and outbreeding depression (Moir et al., 2012; Witzemberger and Hochkirch, 2011).

Theories of human migration suggest that we have special obligations towards individuals and groups who are at great risk in their native environment. Endangered species are similarly at risk, and when alternative strategies are not available, the 'refugee' status of these species means aggressive management techniques are appropriate. The effect of a translocated species on a receiving ecosystem is a concern when making a relocation decision, but with recent assisted translocations reviewed in several papers, the technique is not only accepted (Moritz, 1999; Mueller and Hellmann, 2008), but authors like Donlan et al. (2006) advocate for the re-engineering of ecosystems through assisted migrations (i.e., the Pleistocene rewilding proposal).

7. CONCLUSION

The analogy between human migration and species migration, while imperfect, is capable of providing insights into both the general case of species introductions and the specific case of translocations. While the analogy has

been used in the past to support nativist and cosmopolitan views of introduced species, we believe that by extending the analogy further to include an exploration into the arguments of scholars who have discussed migration ethics, we have come to a conclusion that allows for a more balanced look at species introduction. Additionally, the analogy has provided a novel way of looking at endangered species and translocations, through the use of the refugee framework. Importantly, we would argue that the use of analogy does not need to lead to black and white approaches to conservation, but is capable of providing important insights and novel ideas. While we would stand with the tradition of environmental pragmatism, and emphasise a pluralistic perspective in environmental decision-making, we believe that the careful use and extension of metaphors and analogies can play an important role in this process.

REFERENCES

- Ackerman, B. 1980. *Social Justice in the Liberal State*. New Haven: Yale University Press.
- Arendt, H. 1967. *The Origins of Totalitarianism*. London: George Allen and Unwin.
- Bader, V. 2005. 'The ethics of immigration'. *Constellations* **12** (3): 331–361. [CrossRef](#)
- Botkin, D.B. 2001. 'The naturalness of biological invasions'. *Western North American Naturalist* **61** (3): 261–266.
- Carens, J.H. 2008. 'The rights of irregular migrants'. *Ethics & International Affairs* **22** (2): 163–186. [CrossRef](#)
- Carens, J.H. 1992. 'Migration and morality: a liberal egalitarian perspective'. In B. Barry and R. Goodin (eds), *Free Movement: Ethical Issues in the Transnational Movement of People and of Money*, pp. 25–47. London: Harvester Wheatsheaf.
- Chauvenet, A.L.M., J.G. Ewen, D.P. Armstrong, T.M. Blackburn, and N. Pettorelli. 2012. 'Maximizing the success of assisted colonizations'. *Animal Conservation* **16** (2): 161–169. [CrossRef](#)
- Chew, M.K. and M.D. Laubichler. 2003. 'Natural enemies – metaphor or misconception?'. *Science* **301** (5629): 52–53. [CrossRef](#)
- Colautti, R.I. and D.M. Richardson. 2009. 'Subjectivity and flexibility in invasion terminology: Too much of a good thing?'. *Biological Invasions* **11** (6): 1225–1229. [CrossRef](#)
- Colautti, R.I. and H.J. MacIsaac. 2004. 'A neutral terminology to define "invasive" species'. *Diversity and Distributions* **10** (2): 135–141. [CrossRef](#)
- Conde, D.A., N. Flesness, F. Colchero, O.R. Jones and A. Scheuerlein. 2011. 'An emerging role of zoos to conserve biodiversity'. *Science* **331** (6023): 1390–1391. [CrossRef](#)
- Dickinson, H.C. and J.E. Fa. 2000. 'Abundance, demographics and body condition of a translocated population of St Lucia whiptail lizards (*Cnemidophorus vanzoi*)'. *Journal of Zoology* **251**: 187–197. [CrossRef](#)

HUMAN AND NON-HUMAN MIGRATION

- Donlan, J.C., J. Berger, C.E. Bock, J.H. Bock, D.A. Burney, J.A. Estes, D. Foreman et al. 2006. 'Pleistocene rewilding: an optimistic agenda for twenty-first century conservation'. *The American Naturalist* **168** (5): 660–681. [CrossRef](#)
- Escobar, A. 1998. 'Whose knowledge, whose nature? Biodiversity, conservation, and the political ecology of social movements'. *Journal of Political Ecology* **5** (1): 53–82. [CrossRef](#)
- Fischer, J. and D.B. Lindenmayer. 2000. 'An assessment of the published results of animal relocations'. *Biological Conservation* **96** (1): 1–11. [CrossRef](#)
- Fitzgerald, L., M. Treglia, N. Angeli, T. Hibbitts, D. Leavitt, A. Subalusky, I. Lundgren, and Z. Hillis-Starr. 2015. 'Determinants of successful establishment and post-translocation dispersal of a new population of the critically endangered St. Croix ground lizard (*Ameiva polops*)'. *Restoration Ecology* **23** (6): 776–786. [CrossRef](#)
- Gobster, P.H. 2005. 'Invasive species as ecological threat'. *Ecological Restoration* **23** (4): 261. [CrossRef](#)
- Gordon, H.S. 1999. 'The history of the public health service policy on the humane care and use of laboratory animals'. In C.W. McPherson and S.F. Mattingly (eds) *50 Years of Laboratory Animal Science*, pp. 152–155. Memphis: AALAS.
- Heger, T., W.-C. Saul and L. Trepl. 2013. 'What biological invasions "are" is a matter of perspective'. *Journal for Nature Conservation* **21** (2): 93–96. [CrossRef](#)
- Henderson, R.W. 1992. 'Consequences of predator introductions and habitat destruction on amphibians and reptiles in the post-Columbus West Indies'. *Caribbean Journal of Science* **67** (1): 93. [CrossRef](#)
- Heppes, J.B. and E.J. McFadden. 1987. 'Convention on international trade in endangered species of wild fauna and flora: Improving the prospects for preserving our biological heritage'. *Boston University International Law Journal* **5**: 229.
- Hettinger, N. 2001. 'Exotic species, naturalisation, and biological nativism'. *Environmental Values* **10** (2): 193–224. [CrossRef](#)
- Hewitt, N., N. Klenk, A.L. Smith, D.R. Bazely, N. Yan, S. Wood, J.I. MacLellan, C. Lipsig-Mummé and I. Henriques. 2011. 'Taking stock of the assisted migration debate'. *Biological Conservation* **144** (11): 2560–2572. [CrossRef](#)
- Jordan III, W.R. 1994. 'The Nazi connection: Eugenics, American racism, and German National Socialism'. *Restoration and Management Notes* **28** (1): 113–114. [CrossRef](#)
- Keulartz, J. and C. van der Weele. 2008. 'Framing and reframing in invasion biology'. *Configurations* **16** (1): 93–115. [CrossRef](#)
- Keulartz, J. 2007. 'Using metaphors in restoring nature'. *Nature and Culture* **2** (1): 27–48. [CrossRef](#)
- Kukathas, C. 2002. 'Immigration'. In H. Lafolette (ed.), *The Oxford Handbook of Practical Ethics*, pp. 107–122. Oxford: Oxford University Press.
- Larson, B.M.H. 2007. 'An alien approach to invasive species: Objectivity and society in invasion biology'. *Biological Invasions* **9** (8): 947–956. [CrossRef](#)
- Larson, B.M.H. 2005. 'The war of the roses: Demilitarizing invasion biology'. *Frontiers in Ecology and the Environment* **3** (9): 495–500. [CrossRef](#)
- Light, A. and E. Katz (eds). 1996. *Environmental Pragmatism*. London: Routledge.

- Lodge, D.M. and K. Shriver-Frechette. 2003. 'Nonindigenous species: Ecological explanation, environmental ethics, and public policy'. *Conservation Biology* **17** (1): 31–37. [CrossRef](#)
- Mawdsley, J.R., R. O'Malley and D.S. Ojima. 2009. 'A review of climate-change adaptation strategies for wildlife management and biodiversity conservation'. *Conservation Biology* **23** (5): 1080–1089. [CrossRef](#)
- McKinney, M.L. and J.L. Lockwood. 1999. 'Biotic homogenization: A few winners replacing many losers in the next mass extinction'. *Trends in Ecology & Evolution* **14** (11): 450–453. [CrossRef](#)
- Miller, D. 2008. 'Immigrants, nations, and citizenship'. *Journal of Political Philosophy* **16** (4): 371–390. [CrossRef](#)
- Miller, D. 2007. *Global Justice and National Responsibility*. Oxford: Oxford University Press.
- Minteer, B.A. 2012. *Refounding Environmental Ethics: Pragmatism, Principle, and Practice*. Philadelphia: Temple University Press.
- Minteer, B.A. and J.P. Collins. 2010. 'Move it or lose it? The ecological ethics of relocating species under climate change'. *Ecological Applications* **20** (7): 1801–1804. [CrossRef](#)
- Moir, M.L., P.A. Vesik, K.E.C Brennan, R. Poulin, L. Hughes, D.A. Keith, M.A. McCarthy and D.J. Coates. 2012. 'Considering extinction of dependent species during translocation, ex situ conservation, and assisted migration of threatened hosts'. *Conservation Biology* **26** (2): 199–207. [CrossRef](#)
- Moritz, C. 1999. 'Conservation units and translocations: strategies for conserving evolutionary processes'. *Hereditas* **130** (3): 217–228. [CrossRef](#)
- Mueller, J.M. and J.J. Hellmann. 2008. 'An assessment of invasion risk from assisted migration'. *Conservation Biology* **22** (3): 562–567. [CrossRef](#)
- O'Brien, W. 2006. 'Exotic invasions, nativism, and ecological restoration: On the persistence of a contentious debate'. *Ethics, Place, and Environment* **9** (1): 63–77. [CrossRef](#)
- Olden, J.D., N. LeRoy Poff, M.R. Douglas, M.E. Douglas and K.D. Fausch. 2004. 'Ecology and evolutionary consequences of biotic homogenization'. *Trends in Ecology & Evolution* **19** (1): 18–24. [CrossRef](#)
- Peretti, J.H. 1998. 'Nativism and nature: Rethinking biological invasion'. *Environmental Values* **7** (2): 183–192. [CrossRef](#)
- Pintor, L.M., A. Sih and M.L. Bauer. 2008. 'Differences in aggression, activity and boldness between native and introduced populations of an invasive crayfish'. *Oikos* **117** (11): 1629–1636. [CrossRef](#)
- Ricciardi, A. and D. Simberloff. 2009. 'Assisted colonization is not a viable conservation strategy'. *Trends in Ecology & Evolution* **24** (5): 248–253. [CrossRef](#)
- Sagoff, M. 2005. 'Do non-native species threaten the natural environment?'. *Journal of Agricultural and Environmental Ethics* **18** (3): 215–236. [CrossRef](#)
- Sagoff, M. 1999. 'What's wrong with exotic species?'. *Report from the Institute for Philosophy and Public Policy* **19** (4): 16–23.
- Schlaepfer, M.A., D.F. Sax and J.D. Olden. 2011. 'The potential conservation value of non-native species'. *Conservation Biology* **25** (3): 428–437. [CrossRef](#)

HUMAN AND NON-HUMAN MIGRATION

- Seglow, J. 2005. 'The ethics of immigration'. *Political Studies Review* **3** (3): 317–334. [CrossRef](#)
- Shacknové, A. 1988. 'American duties to refugees: Their scope and limits'. In M. Gibney (ed.), *Open Borders, Closed Societies?*, pp. 131–151. New York: Greenwood Press.
- Simberloff, D. 2003. 'Confronting introduced species: A form of xenophobia?'. *Biological Invasions* **5** (3): 179–192. [CrossRef](#)
- Simberloff, D. 2006. 'Invasional meltdown 6 years later: Important phenomenon, unfortunate metaphor, or both?'. *Ecology Letters* **9** (8): 912–919.
- Singer, P. and R. Singer. 2010. 'The ethics of refugee policy'. In P. Singer and R. Singer (eds), *Population and Political Theory*, pp. 285–304. Chichester: Wiley-Blackwell.
- Singer, P. 2003. 'The place of nonhumans in environmental issues'. In A. Light and H. Royston (eds), *Environmental Ethics: An Anthology*, pp. 55–64. Chichester: Wiley-Blackwell.
- Soulé, M. 1990. 'The onslaught of alien species, and other challenges in the coming decades'. *Conservation Biology* **4** (3): 233–239. [CrossRef](#)
- Subramaniam, B. 2001. 'The aliens have landed! Reflections on the rhetoric of biological invasions'. *Meridians: Feminism, Race, Transnationalism* **2** (1): 26–40.
- Terborgh, J. 1974. 'Preservation of natural diversity: The problem of extinction prone species'. *BioScience* **24** (12): 715–722. [CrossRef](#)
- Usio, N., M. Konishi and S. Nakano. 2001. 'The role of aggressive interactions and shelter competition'. *Biological Invasions* **3** (2): 179–185. [CrossRef](#)
- Vorburger, C. and G. Ribí. 1999. 'Aggression and competition for shelter between a native and an introduced crayfish in Europe'. *Freshwater Biology* **42**: 111–119. [CrossRef](#)
- Walzer, M. 1983. *Spheres of Justice: A Defense of Pluralism and Equality*. New York: Basic Books.
- Whitehead, H., L. Rendell, R.W. Osborne and B. Würsig. 2004. 'Culture and conservation of non-human with reference to whales and dolphins: Review and new directions'. *Biological Conservation* **120** (3): 427–437. [CrossRef](#)
- Witzenberger, K.A. and A. Hochkirch. 2011. 'Ex situ conservation genetics: A review of molecular studies on the genetic consequences of captive breeding programmes for endangered animal species'. *Biodiversity and Conservation* **20** (9): 1843–1861. [CrossRef](#)
- Woods, M. and P.V. Moriarty. 2001. 'Strangers in a strange land: The problem of exotic species'. *Environmental Values* **10** (2): 162–191. [CrossRef](#)
- Ypi, L. 2008. 'Justice in migration: A closed borders utopia?'. *Journal of Political Philosophy* **16** (4): 391–418. [CrossRef](#)
- Zavaleta, E., J. Pasari, J. Moore, D. Hernandez, K.B. Suttle and C.C. Wilmers. 2009. 'Ecosystem responses to community disassembly'. *Annals of the New York Academy of Sciences* **1162** (1): 311–333. [CrossRef](#)