



Online Ethics Center  
FOR ENGINEERING AND SCIENCE

# Sample Case Response

## Description

This page shows a sample case response for the course "[Genomics, Ethics, and Society](#)."

## Body

**Imagine that you are in charge of making a decision about whether or not to move rust-resistant whitebark pine. Consider the social, cultural and ecological values that may be at stake. What would your recommendation be? Should rust-resistant whitebark pine be moved to new locations in Canada?**

### ***Introduction:***

This case concerns the assisted migration of selected, relatively rust-resistant strains of the whitebark pine (WBP), to locations in Western Canada, north of the species' current habitat. In this case study analysis, I will consider whether this species should be translocated. Drawing on empirical sources, I'll begin by explaining some of the relevant background to this case. Then I'll consider selected key values at stake in assisted migration of WBP: the intrinsic value of species, ecological values, wildness values, and aesthetic/cultural values, and I will argue that although there are significant concerns about selecting and relocating WBP, on balance, it would be better to do this than to allow the species to become extinct.

Given the brevity of this analysis, there are some issues I won't have room to discuss, in particular animal suffering/pleasures, the environmental justice issues this case may raise, and relevant consultative processes.

## ***Empirical context:***

This case is located in the context of significant climate change. Species are already moving upward and poleward in response to warming temperatures (Parmesan and Yohe 2003). However, many species are unable to relocate themselves, and are at risk of extinction, especially where factors such as disease exacerbate effects of climate change. The WBP appears to be one example of such a species. As the case study describes, this tree species faces multiple threats. For this reason, two key strategies to preserve the WBP have been proposed: selecting rust resistant strains, and translocating the tree further north.

Rust-resistant WBP seedlings have already been established in nurseries; experimental planting of these seedlings is already under way and may succeed in re-establishing WBP in some areas where it's currently threatened (McKinney et al. 2009). However, the species takes about 30-50 years to begin producing cones, and several decades more to produce significant seed crops, giving an estimated generation time of at least 60 years (COSEWIC 2010). By the time these rust-resistant trees have themselves reached reproductive maturation, we can expect fairly substantial warming to have occurred. If McLane and Aitken (2012) are right, in 60-80 years, when these trees are in their reproductive prime, most of their current climatic niche in the US will be lost.

One question that might be asked here is why WBP isn't moving north without human help, especially as McLane and Aitken's (2012) study suggests that locations much further north can already be tolerated by WBP seedlings. Studies suggest, though, that rust infection is high at current northern limits of the WBP, potentially discouraging nutcrackers from caching and limiting natural migration (Smith et al. 2013: 95). So, *if* we want to preserve WBP, the best chance is to assist its migration ourselves. This "*if*" raises crucial value questions about why we might want to move the WBP – and why there might be strong opposition to doing so.

## ***Value concerns:***

Assisted migration is, essentially, a value-driven practice (e.g., Minter and Collins 2010, Aubin et al. 2011, Schwartz et al. 2012). The primary reason usually offered in support of assisted migration proposals is to protect valued species in the face of climate change. But assisted migration also attracts significant value-driven opposition, focused on the potential both for negative impacts on valuable recipient

ecosystems and species in those systems (ie on potential *value-losses* from assisted migration) and on doubts that assisted migration will actually protect many of the values for which it's being carried out (ie a failure to *preserve* values).

The most straightforward reason for protecting WBP is that the species has "intrinsic" or "non-instrumental" value or "moral status". This claim can have several forms. On one view, species can have (and most species do have) *subjective* intrinsic value, meaning that people actually do subjectively value them (Callicott 1989, Elliot 1992). On a second view, species have *objective* intrinsic value, independently of whether anyone actually subjectively values them or not (Rolston 1986). One prominent version of this second view takes objective value to mean having "moral status", based on the claim that species have interests, a good of their own, and can be benefited and harmed (Johnson 2003). This objective value/moral status view is often held by conservationists, and would support the relocation of WBP, if relocation were likely to succeed without endangering other species, or compromising other significant values. However, the idea that species have objective value or moral status is highly contested and philosophically difficult to defend (see Sandler and Crane 2006). Nonetheless, it's certainly true that many people do *subjectively* value species, including the WBP; other things being equal, those who intrinsically valuing species would in principle be in favour of relocating the WBP.

However, a number of other value considerations are also at stake here. Given the space constraints of this analysis, I'm able to discuss, briefly, just three of them: (a) invasiveness and ecosystem values (b) wildness/naturalness values and (c) aesthetic and cultural values. (a) *Invasiveness and ecosystem values*: Assisted migration means moving the WBP into an area where it is not native. In principle, this risks the WBP flourishing at the expense of native species or the functioning of the recipient ecosystem, and therefore risks the value carried by other species, or ecosystems (see Ricciardi and Simberloff 2008). This is a significant concern to some conservationists, important stakeholders here. (In fact, one of the most interesting things about this case is that it may pitch conservationists against one another, even where they hold the same values, depending on what they think the impact of moving WBP might be.)

WBP (unlike some other species) is extremely unlikely to become invasive after relocation because of its 'slow reproductive maturation, infrequent cone crop, poor competitive ability relative to other trees, and habitat-specialist life history strategy'

(McLane and Aitken 2012: 151). In addition, if we suddenly needed to remove whitebark pine, it could be easily identified and felled. Indeed, WBP might make valuable *positive* ecological contributions in its new location, potentially providing a valuable food source, retaining soil moisture and modifying soil temperatures, slowing the progression of snowmelt, and helping to prevent flooding at lower elevations, just as it does in its current location.

*(b) Wildness/Naturalness values:* The mountains of the North American West, both in the US and in Canada, are widely valued for their 'wildness' or 'naturalness'; that is, for being in some sense 'human independent'. While 'human independence' can be understood in different ways, one common interpretation concerns the genesis or history of an organism, species, ecosystem or place, as emerging from processes 'unmodified by human activity' (Elliot 1982: 79-80). One worry about moving the WBP is that it threatens the value of wildness – a concern to stakeholders including wilderness recreationists and many other environmentalists. Of course, WBP is already severely compromised due to unintentional and indirect human activity. But many environmentalists argue that *purposive* human activity compromises wildness further, because humans intend, or design, particular outcomes. Saving WBP involves selecting and propagating human-chosen rust-resistant genetic strains, giving the very genetic fabric of the species human imprint and purpose; *and* moving it to new locations, where the trees will interact with other organisms, and might be thought to render the whole area in which they are located less wild. This worry, though, is less acute if wildness were to be differently understood. If, for instance, wildness was taken to refer to an ongoing, rather than a historical state, then it might be argued that if humans moved WBP into an area, then left the trees to forge their own relationships in the recipient system, over time the pines and the whole system might be thought to regain wildness, inasmuch as the system would be self-directing, and evolutionary processes would continue without human intervention.

*(c) Cultural, Place and Aesthetic Values:* WBP has significant aesthetic, cultural and historic value. The trees form distinctive twisted, crooked communities at the treeline (Tomback and Achuff 2010: 192), with which many people are familiar through mountain photography, and which are widely highly valued aesthetically. Relocation would ultimately produce these same forms – but not for decades, during which many of those people who currently aesthetically value these treeline communities would have died. It's possible that future people who have never

experienced these communities will not miss them, so perhaps this aesthetic loss does not matter. But the extinction of the whitebark pine would close down the option of aesthetic appreciation for future people entirely; it's not unreasonable to think of them as stakeholders in this case. This may be a reason (though perhaps a weak one) in favour of translocation.

WBP also has high cultural and historic value for narratives of 'place' in the American West (e.g., Tomback and Achuff 2010, Logan and Powell 2001). Genetic selection and assisted migration can't preserve this value, because WBP will no longer grow in places where the species carries historic and cultural meaning. And planting WBP further north might disrupt other existing narratives of those places, narratives that *don't* include WBP. What's clear is that where values are dependent on the existing local context, they'll inevitably be lost; planting WBP elsewhere can't (as Sandler [2013] argues) retrieve context-related values, and may risk compromising context-related values elsewhere.

### ***Concluding Argument - Why We Should Seriously Consider Assisted Migration:***

Assisted migration of rust-resistant WBP strains may be the only way to preserve the species into the future. If we think that a species has some kind of intrinsic value or moral status, this is a presumptive reason in favor of moving it. This reason might be defeated if WBP was likely to be invasive in its new location, and to threaten native species. But this is extremely unlikely. For 30-60 years, until relocated WBP starts setting seeds, it will remain exactly where it is planted; and will only propagate at all with a healthy translocated nutcracker population *in situ*. So, invasiveness is not a plausible reason for resisting relocation; and, as we've seen, WBP might provide ecological benefits. If the climate in the WBP's new location were to become more like its native climate, the provision of these benefits might be particularly useful. In terms of ecological values, then, there is low risk and a chance of benefit from relocation.

However, some of the WBP's current value is tied to context, and won't transfer to a new location. While wildness and aesthetic values may return as relocated whitebark pine grows and 'naturalizes', there would still be significant value discontinuity. What's more, there's the possibility that aesthetic, cultural, historic and wildness values are compromised more generally in the new location (though this would

depend on the particular proposal for assisted migration). Are these value concerns sufficient to shift the balance against relocating WBP? I would argue not. The processes at work here are global. The landscapes into which WBP would be relocated are going to change. Species now present in Western Canada will also be moving upward and poleward; new species will move in; novel ecosystems will form, whether WBP is moved or not (see Hobbs et al. 2013). Narratives of place will have to change, and human influence will anyway extend across the changing landscape. The relocation of WBP would not be the intrusion of an alien into a long-established and unchanging ecosystem, but a new member of a novel ecosystem with some potentially useful functions.

In addition, though there may be discontinuity of aesthetic value, assisted migration will mean that future generations will at least have the opportunity to admire the twisted grandeur of the whitebark pines on high Northern treelines. Given the pervasiveness of human influence, this may, also, be a time to consider deliberately creating new narratives of place: where, for instance, stories about how a species came to a place (rather than stories of wildness) become part of what *makes* the value of place. Those who argue that species have moral status might deepen these narratives in terms of ‘restitution’ to species, such as WBP, that have been forced out of other locations by human activities (on this view species themselves could be seen as stakeholders). Even if species are not seen as stakeholders, it may be possible to defend the view that assisted migration of threatened species, where humans are responsible for the threat, is a kind of symbolic reparation, that perhaps expresses “a disposition to cherish what has enriched one’s life, an appreciation of one’s place in the universe” (Palmer 2012, Hill 1983).

To conclude: This is not an argument for anything as strong as a *duty* to relocate WBP. However, there are good reasons to do so, and (based on the values discussed here) few very strong ethical objections. My claim is that if rust-resistant strains of WBP can be clearly identified, depending on the outcome of economic and feasibility studies, and consultation at particular sites, there are likely to be places where relocation of WBP is ethically desirable.

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