

Managed relocation: a nuanced evaluation is needed

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Managed relocation (aka ‘assisted colonization’ and ‘assisted migration’ [1,2]) aims to save species from the effects of climate change by purposefully transporting them to areas where they have not previously occurred, but where they are expected to survive as temperatures increase. In a recent Opinion article in *TREE* [3], Ricciardi and Simberloff suggest that ‘assisted colonization is tantamount to ecological roulette and should probably be rejected as a sound conservation strategy by the precautionary principle.’ We disagree for three primary reasons.

First, the precautionary principle is not a stand-alone reason to rule out managed relocation. It states that ‘Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.’[†] In the context of managed relocation, ‘precaution’ cuts both ways, as a motivation to avoid relocations that might cause unwanted harm and as a motivation to act before a species is driven extinct by climate change.

Second, we know more about the impacts of species invasions than Ricciardi and Simberloff suggest, particularly with respect to species extinction. For instance, extinctions facilitated by exotic species occur primarily on islands (>90%) as opposed to continents [4]. Also, extinctions are generally caused by predation as opposed to competition; there are no documented cases to our knowledge where competition from exotic species has been the sole causal factor for the extinction of any native species [4]. Indeed, over the past few hundred years, thousands of exotic plant species have been introduced to islands around the world, but few native plant species have become extinct as a result [5]. Given sufficient time, competition from plant species might eventually cause extinctions, but this has not yet occurred. Collectively, these findings suggest that relocated plant species are unlikely to cause extinctions, at least over the next few hundred years, and especially not within continents. Other findings (e.g. Ref. [6]) exist that can help inform the risks of relocating species, both with respect to species extinctions and ecosystem functioning.

Third, because extinctions are permanent and irreversible, using managed relocation to reduce extinctions at the cost of changing the composition and functioning of ecosystems is a tradeoff that some managers might be willing to make. This will be particularly true if most changes that result from relocations are small, and if those that are large are not necessarily detrimental. In considering these tradeoffs it is important to recognize that ‘most invasions appear to have only minor impacts’ [3] and that these impacts are not necessarily detrimental. Indeed, many exotic species provide important ecosystem services; for example, invasive aquatic plants can maintain water quality and provide habitat for native species [7].

Ultimately, the risk of species extinctions from climate change is too large to summarily discount managed relocation without first carefully evaluating its benefits and dangers in a nuanced way. Beginning this process now will better position us to make informed decisions in the years ahead, as threats of climate-mediated species extinctions become more common.

References

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[†] Rio Declaration Anon. (1992).