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Science for Environment Policy

Framework to aid decisions on translocating species threatened by climate change

A new framework to help decide whether to translocate species that are threatened by climate change has been developed. The framework provides a simple method of assessing different strategies and ensuring that limited budgets are used effectively.

As global warming progresses, some species, unable to adapt to the changing conditions, are predicted to become extinct. To combat this, species can be 'translocated'—moved to areas where they do not naturally occur, but which provide more suitable conditions. However, this practice is controversial and some argue that the benefits do not always outweigh the financial and ecological risks. Translocating a species is costly and, once established, it may become invasive, causing even greater ecological damage.

In order to ensure that translocations provide the maximum biodiversity benefits and make the most of limited conservation budgets, a transparent and rigorous decision-making framework is required.

For this study, researchers developed such a framework, which can be used to decide whether or not to translocate, to evaluate different introduction strategies and locations and to assess cost-effectiveness. The framework is based around a 'decision tree', which considers the probabilities of success (based on qualities of the species itself, the strategy used and the location) and the negative environmental impacts of the introduction.

The outcome is the 'value' of the species minus any negative environmental impacts. 'Value' in this case does not imply monetary value alone, but is based on a range of stakeholder views and may include aspects such as cultural or economic significance, or the importance of that species to the function of the ecosystem as a whole.

Populations, as well as species, may have different values. For example, the decision maker may prefer that the source population persists, and can therefore set any strategy that jeopardises this (e.g. by removing large numbers of individuals for translocation) to have less overall value.

The framework can also be used to compare the cost-effectiveness of different options. This analysis, unlike cost-benefit analysis, does not require a monetary value to be assigned to species or ecosystems because it compares options by dividing the benefits in any chosen unit by the cost. Such analysis would enable conservation managers to prioritise budget allocation more effectively.

Crucially, the framework also takes into account the inherent uncertainty that will accompany some of the predictions used to calculate the outcomes. Incorporating the uncertainty associated with each prediction means that decision makers can explicitly choose between, for example, an option with the greatest benefit but a large uncertainty, and an option with smaller predicted benefits but a more certain outcome.

This framework, conclude the researchers, will allow measured, transparent decision-making in complex situations that are often associated with substantial uncertainties and conflicting viewpoints.

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Contact: tmrout@unimelb.edu.au

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