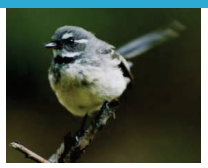
NCCARF
National Climate Change Adaptation Research Facility
Adaptation Research Network
TERRESTRIAL BIODIVERSITY





INFORMATION SHEET TWO

Assisted Migration as a Management Tool for Species Threatened by Climate Change

Climate zones are shifting rapidly. For some species, dispersal is adequate for tracking environmental change, but for others the rate of climate change will exceed their ability to adapt in their current range or disperse to more climatically suitable habitat. In some cases, a radical management action known as 'assisted migration' may be required to help species persist into the future and prevent climate change related extinctions.

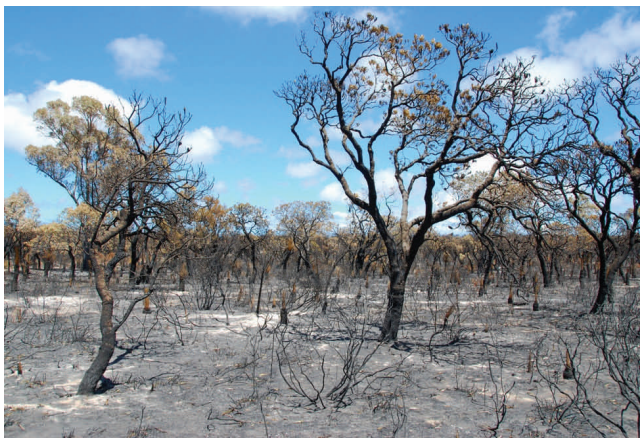
This information sheet explains the concept of assisted migration as a management strategy for terrestrial species threatened by climate change, including some of the more controversial aspects of this approach and implications for managers and policy-makers.

What is Assisted Migration?

Assisted migration (AM), also known as translocation, assisted colonisation, or managed relocation involves removing individual plants or animals from an area which has, or will become, unsuitable due to climate change, and moving them to a new site where conditions will be more suitable.

AM is considered a radical and controversial type of human intervention. Most previous instances of AM have been undertaken to protect threatened species from predators, but it is increasingly being discussed as a potential tool for conservation in the face of climate change.

Although the role of AM is still being vigorously debated, some prominent climate change scientists support it under certain circumstances, along with the Ecological Society of Australia.



Climate change induced events, such as frequent wildfire, cyclones or drought, could make habitat unsuitable for some vulnerable species (© L.Valentine).

Translocations to predator-free Escape Island have helped boost numbers of the endangered marsupial, the dibbler (*Parantechinus apicalis*). (© K. Bleby)

Assisted Migration in Action

An estimated 200 translocations or re-introductions of 42 vertebrate species have been undertaken in Australia for conservation purposes.

Mammals and birds have largely been the focus of these efforts to date.

For example, a population of captive-bred dibblers, an endangered marsupial from Western Australia, was translocated to a predator-free island in the 1990's. This translocation has been deemed a success and dibblers have since been re-introduced on the mainland at several other sites.

A similar translocation of Gilbert's potoroo's, Australia's most endangered mammal, to Bald Island also seems to have been successful, at least in the short term.

However, not all translocations are successful and Australia seems to have a higher failure rate than many other parts of the world. This is probably related, in part, to the presence of introduced cats and foxes in most mainland habitats.

The 'con's' of assisted migration

A number of concerns must be addressed when considering AM. Perhaps the most important is the potential for the translocated species to become a pest or to disrupt ecosystem functions at the newly colonised site. Other potential problems include:

- The difficulty of predicting optimal future habitats, particularly for rare species where detailed climate-habitat data, and potential biotic interactions, is lacking.
- Risk of taking too many individuals from the source population and causing an overall decline.
- Lack of knowledge as to what actually limits or threatens the species distribution (climate vs. other factors).
- Presence of other threatening factors, such as predators, disease or habitat loss, at the new location.
- Risk of introducing diseases or parasites to the new site.

If frogs are moved, threatening factors such as the chytrid fungus would have to be considered at the new location (© Ant Backer).

Which species could be candidates?

Many factors should be considered when deciding if and when a species should be a candidate for AM. Climate change should be confirmed as the primary threatening factor, and the inability of the species to adapt to climate change *in-situ* should be established along with its potential to migrate or otherwise adapt without human intervention.

Inter-continental translocations are thought to be most risky, in terms of both establishment failure and the danger of the translocated species becoming invasive. Experts suggest that the most suitable scenario will be when risk of extinction of a target species is high, but the risk to the existing community at the translocation site is low. For example, most endangered Australian mammals once had much greater geographic ranges. These species could be re-introduced to sites within their historic range where they are less likely to become invasive and may be able to adapt to their new environment.

Other candidates might include altitudinally restricted plants, frogs or reptiles, which have a low capacity for dispersal but could be moved to higher altitudes close to their native range.

Implications for Managers and Decision-makers

Most experts agree that AM should be considered only as a last resort, when all other actions to save a species from climate change have failed. The costs associated with translocation projects can be considerable; an estimated $0.6 million was spent on the dibbler translocation project. In many cases it may be more cost-effective to direct funds toward measures which help species adapt and survive *in-situ*, such as enhancing ecosystem resilience, allowing for genetic translocation to boost evolutionary potential, or providing refuges from extreme weather.

Guided AM will require an experimental and timely approach and adaptive management should be a priority. Vulnerable species should be monitored to detect declines and identify causes. We will need robust protocols to help determine which species to move and when to move them, and to decide whether translocation is economically efficient, ecologically safe and socially acceptable.

Funds may be better spent on other actions, such as re-vegetation, which help species adapt *in-situ* and increase ecosystem resilience.

About the Adaptation Research Network for Terrestrial Biodiversity

The Adaptation Research Network for Terrestrial Biodiversity is one of eight research networks administered by the National Climate Change Adaptation Research Facility. It is hosted by James Cook University in Townsville, north Queensland.

Convenors:

Assoc. Prof. Steve Williams
Ph: +61 (0)7 4781 5580
stephen.williams@jcu.edu.au

Prof. Lesley Hughes
Ph: +61 (0)2 9850 8195
lhughes@bio.mq.edu.au

Coordinator:

Dr Yvette Williams
Ph: +61 (0)7 4781 5552
yvette.williams@jcu.edu.au

Our Website:

www.nccarf.edu.au/terrestrialbiodiversity

More Information:

To join our Network, please email yvette.williams@jcu.edu.au.

For more information on the Climate Change Adaptation Research Facility and other Research Networks, please visit www.nccarf.edu.au

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This information sheet was designed and compiled by Jo Isaac, with professional input from Stephen Garnett, Ary Hoffmann, Lesley Hughes, Eve McDonald-Madden, Tara Martin and Hugh Possingham.