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News and Views

Fauna-rescue programs highlight unresolved scientific, ethical and animal welfare issues

Peter Menkhorst[A,B,C], *Nick Clemann*[A,B] *and Joanna Sumner*[B]

[A]Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, PO Box 137, Heidelberg, Vic. 3084, Australia.
[B]Museum Victoria, Carlton Gardens, Melbourne, Vic. 3000, Australia.
[C]Corresponding author. Email: peter.menkhorst@delwp.vic.gov.au

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Growth of human populations and human consumption of resources often involves the destruction of wildlife habitat, such as the removal of native vegetation to make way for agriculture, urban expansion, mining and industrial development. Such habitat destruction results in the death of vast numbers of organisms – vertebrate and invertebrate animals, vascular and non-vascular plants. This loss is widely recognised as a problem by the Australian community and, consequently, all levels of Government (Federal, State and Local) have developed both legislative and policy instruments aimed at conserving and protecting flora and fauna and its habitat.

In a recent example of such habitat destruction, Thompson and Thompson (2015) describe two cases of land development in Western Australia that involved the total removal of native vegetation; on land parcels of ~14 ha of shrubby heathland on the Swan Coastal Plain and ~1000 ha of coastal dunes and sandplain near Onslow in northern Western Australia. They document 'fauna-rescue programs' at these sites in which much effort and resources were expended to capture as many of the resident, small, terrestrial vertebrates as possible and release them elsewhere. The large number of individual animals and species involved (960 individuals of 41 species on the Swan Coastal Plain and 17 057 individuals of 70 species near Onslow) brilliantly highlights what is lost when habitat is destroyed (and that's only the small vertebrates). Thompson and Thompson (2015) documented the different techniques used to collect small vertebrates, the range of species and numbers of individuals captured, and the level of observed deaths and injuries during the clearing process associated with the use of different machinery. Animals collected alive and uninjured during these clearing events were released in 'adjacent suitable habitat'. There was no assessment of the survival of the translocated animals. Despite this, Thompson and Thompson (2015) went further and recommended that State Government agencies should prepare guidelines for fauna rescue and that development companies should fund fauna-rescue programs.

This is not an isolated example: such activities, also referred to as salvage, or mitigation translocation, have become a common strategy aimed at reducing mortality when habitat is destroyed (Edgar *et al.* 2005; Germano *et al.* 2015). Mitigation translocations are often undertaken at relatively short notice and without a clearly defined purpose. Further, they lack agreed principles and guidelines, in contrast to conservation translocations, for which a clear decision-making process and standards have been developed (IUCN Reintroduction Specialist Group 2013).

We are alarmed that mitigation translocations seem to be widely advocated when there are important scientific, ethical and animal welfare issues that have not been adequately addressed. We are particularly concerned that the use of translocation techniques can create a perception that development and loss of native vegetation can proceed with minimal 'cost' to biodiversity – which then creates an environment that justifies further and on-going loss of habitat. Here, we highlight six issues of particular concern with mitigation translocations: (1) defining and measuring success; (2) assessing suitability of release sites; (3) meeting animal welfare standards; (4) failing to recognise the complexity and diversity of potential impacts; (5) lack of clear aims, monitoring strategy and contingency planning; and (6) creating unrealistic community expectations of positive outcomes.

Defining and measuring success in wildlife translocation

Defining success of wildlife translocations is neither straightforward nor easy (e.g. Edgar *et al.* 2005). However, we suggest that a translocation cannot be considered successful unless it can be shown, as a minimum, that some proportion of the translocated animals survived being moved, established home ranges, and successfully participated in breeding activities. Ideally, success would equate to the establishment and long-term persistence of the taxon at the release site (IUCN Reintroduction Specialist Group 2013) without significant detriment to any resident taxa at the release site. Capture and translocation with subsequent death of most or all individuals cannot be considered a success and cannot justify the effort and

costs of a 'fauna-rescue program'. Similarly, the impacts of the new animals on resident populations of all significant taxa at the release site need to be considered, from both the ecological and animal welfare perspectives. Thus, some form of measurement of post-release outcomes is essential for any translocation project.

Suitability of release sites

A precondition for successful 'fauna rescue' is that alternative habitat is available, can be accurately recognised as such, and has the capacity to receive, and indefinitely support, the translocated individuals and their offspring. If we define habitat as 'the environment of a species, and particularly those features that determine where the species occurs' (Bamford and Calver 2014) (i.e. habitat is species specific), then clearly these judgements need to be made for each taxon that is to be relocated. We suggest that the proportion of taxa for which our understanding of habitat is adequate to allow reasonable judgements about these issues is small. This means that mass, indiscriminate 'fauna rescue' faces a high risk of inadvertently placing animals into suboptimal habitat. Alternatively, if the release area does represent good habitat for a given taxon it is likely that it already supports a population of that taxon – if it does not, careful consideration is required into why this is so (i.e. are there unresolved threatening processes operating?). Either way, we maintain that the conservation and animal welfare outcomes may well be no better than doing nothing (see following section).

Animal welfare issues associated with poorly planned translocations

Individual animals placed into less than optimal habitat, or habitat that already supports a population of their species, face an uncertain future. They are unlikely to thrive, may be forced to undertake long and risky movements, and will likely die from predation, starvation, exposure or misadventure. Recurring themes from fauna translocations for which outcomes have been determined and documented include high mortality and atypical, and probably detrimental, spatial ecology and habitat use (e.g. Butler *et al.* 2005*a*, 2005*b*). High mortality of translocated individuals has been demonstrated for mammals (e.g. common brushtail possum, *Trichosurus vulpecula* (Pietsch 1994), lizards (e.g. Platenberg and Griffiths 1999; Sullivan *et al.* 2015), turtles (Hester *et al.* 2008) and snakes (e.g. Roe *et al.* 2010).

Failing to recognise the complexity and diversity of potential impacts

Animal 'rescue' programs are often indicative of a narrow perspective that focusses on the individuals being 'rescued' and does not give adequate consideration to potential impacts on the receiving ecological communities (Deem *et al.* 2001; Clemann 2013). Proponents need to consider what cascading effects might be set in train by adding new taxa to an existing faunal (and floral) community, and new individuals to an existing population – for example, potential aggressive or territorial interactions between conspecifics or competitors (Done and Heatwole 1977; Pietsch 1994). The threat of inadvertent transmission of disease, for example *Chytridiomycosis*, is another concern that is becoming increasingly apparent (Sainsbury and Vaughan-Higgins 2012). The risk of outbreeding depression due to translocations may have been overstated in the past, but genetic effects on the recipient population, such as a loss of local adaptation, should also be considered before translocations occur (Weeks *et al.* 2011).

Lack of clear aims, monitoring strategy and contingency planning

Mitigation translocations are not the same as conservation translocations – but there is much to learn from the detailed research, monitoring and policy work that has gone into conservation translocations, summarised and distilled by the IUCN Reintroduction Specialist Group (2013). Conservation translocations have the following characteristics that would appear to be absent from many mitigation translocations:

- they usually involve only a single species, not whole assemblages;
- they are based on detailed planning, including careful selection of individuals to be translocated and detailed assessment of release sites, including habitat quality, long-term security and capacity to absorb the added individuals of each species;
- they include a risk-assessment process and contingency planning in case expectations are not met;
- they often involve prior trialling of release techniques, including soft and hard releases; and
- they always include careful monitoring of outcomes for the translocated animals.

When the outcomes of translocations are actually measured, the results indicate that conservation translocations are usually considerably more successful than 'mitigation' translocations (e.g. Sullivan *et al.* 2015; Germano *et al.* 2015). These results indicate that translocations that are poorly conceived and planned are usually unjustifiable from a conservation perspective (Pérez *et al.* 2012).

Creating unrealistic community expectations of positive outcomes

The assumption that animals forced to move from their home range can survive elsewhere is commonly held amongst the general public, but lacks convincing scientific support. Advocating for the continuation of mitigation translocations ignores the complexity of the problem and creates an impediment to achieving reasonable conservation and animal welfare outcomes. There is a risk that developers and Governments could view mitigation translocation as a 'feel good' solution to the problem when the most likely outcome may be worse than doing nothing. As a society we need to openly and honestly acknowledge the conservation and animal welfare costs of destroying habitat, and build those costs into the planning and assessment processes for proposed developments. Furthermore, if the true and accruing costs of incremental habitat loss were widely understood, without the distraction of relocating animals, the value of existing habitat will be more thoroughly appreciated.

Conclusion

We contend that mitigation translocations rarely produce the desired outcomes and should not be used as a surrogate for habitat retention, or, failing that, a meaningful habitat-offset system, properly applied. We are particularly concerned with the promotion of mass, generic mitigation translocations, and suggest that such projects have a high probability of doing more harm than good. Until carefully designed studies have been undertaken on the outcomes of mass mitigation translocations they should not be part of any environmental mitigation plan. We have argued elsewhere that a better use of a sample of animals whose habitat is about to be destroyed is as voucher specimens for the appropriate State Museum (Clemann *et al.* 2014), rather than releasing them at an unfamiliar location to an unknown, but probably unhappy, fate.

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