

Genetic approaches make irreplaceable, cost-effective contributions to analysis and monitoring of species' responses to landscape change

^AP. Sunnucks and ^AA.C. Taylor

^A School of Biological Sciences and Australian Centre for Biodiversity, Monash University
Clayton 3800

There is great concern about how landscape change will affect the persistence of native plants and animals, and the services they provide. After land clearing, the next biggest fundamental concern is how population processes of species - birth and death rates, migration and genetic exchange - are affected. The science of population genetics (particularly the areas dubbed 'molecular ecology' or 'landscape genetics') is already making otherwise inaccessible contributions to the analysis and monitoring of landscape change. It can yield powerful and unambiguous information about where individuals and species move, who they reproduce with, what landscape features and arrangements constitute connected habitat versus filters or barriers, and if mobility is restricted, does it matter?

It is a common misconception that the genetic signatures of landscape change will necessarily take many generations to be detectable, but this is not the case. Genetics offers methods for detecting changes in population processes over very short timeframes – years to decades rather than many decades or more. It is surprising to many non-geneticists is that (1) these methods are available now and are being wholeheartedly applied by management agencies elsewhere in the world, and (2) they are highly cost-effective.