

Symposium Introduction

Bolstering the refuges: Restoring health and resilience to remnant ecosystems at a time of climate change.

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Summary

Ecological restoration is critical to conserving species. With climate change there is an even stronger case for conservation – particularly for the small isolated patches across rural landscapes. These patches are often the last stands of some vegetation types, the refuges of species that are not represented anywhere else, and the building blocks that make ecological restoration possible. But they are often damaged and unprotected. Restoration under climate change means putting a greater emphasis on allowing species to adapt – with a focus on conserving ecological processes such as connectivity. How we restore functional, diverse and resilient ecosystems that will also continue to support people and production – at the large-landscape scale and with climate change - is very demanding.

Ecological restoration is critical to conserving species, we have always known this, but with climate change there is an even stronger case for conservation. Conserving species puts a new emphasis on the importance of the small isolated patches - and we need to urgently prioritise their restoration at a scale that will make a difference.

Today we are to talk about the fragments of habitat left in our cleared landscapes; the stand of sheoaks on a rocky slope in a heavily grazed paddock; a lonely giant paddock tree; patches of native grasses on grazing properties or on roadsides.

We here today, probably better than most, value these vestiges of once more widespread and boundless ecosystems. Many of us are regularly saddened as we see them degrading and even disappearing around us.

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We value them variously as the last stands of a vegetation type that contain species that are not represented anywhere else – and are under threat. We use these remnants as a seed source. And we use them as building blocks that make ecological restoration possible - restoring an ecosystem from ground zero is very difficult.

In introducing the topic today, I want to briefly mention two important studies that powerfully demonstrate the value of remnant patches and why we need to do more to restore them to health and resilience.

Conservation value of remnants

The first, undertaken by Brendan Wintle and team (Wintle *et al.* 2018), specifically looked at the conservation value of small and often fragmented remnant patches versus larger-more intact patches. They undertook a global synthesis of 31 spatial conservation studies.

Approaches to conservation prioritisation in Australia and many places elsewhere have given more weight to conserving the larger more intact areas of the landscape. And there is good reason to highly value large patches - but it has come at the expense of relegating the smaller bits as less valuable, dispensable, trade-offable or not regarded at all.

What Brendan found was that the small isolated patches of remnant habitat are likely to contain disproportionately more unique or rare biodiversity values that may be irreplaceable, compared with equivalent sized areas in highly intact landscapes. What this study is saying is that if we want to conserve the full range of biodiversity, we should be putting a stronger emphasis upon, and greater effort into, restoring the small bits left.

In Victoria these bits are on the more productive soils in higher rainfall areas that have been transformed for agriculture. We need to elevate the profile of these precious scraps left in these landscapes.

But they are often damaged - missing key components and as well as being threatened by their isolation in the landscape, weed species, etc. And they are now having to contend with the impacts of climate change.

In planning today, Janet Hagen and I were talking about the restoration projects she has been doing, and she made the comment “this stuff isn’t easy, its getting harder...the climate is making it harder”.

This is a Grey Box tree in a paddock just out of Euroa. You can see that it has recently died by the many smaller branches still on it. Janet said this year many Grey Box have succumbed and – so too the stringy barks and red box. And of course. if you lose an old paddock tree like this



you lose all the things that depend upon it – one less nesting site for hollow-dependant birds and mammals, all the insects, etc.

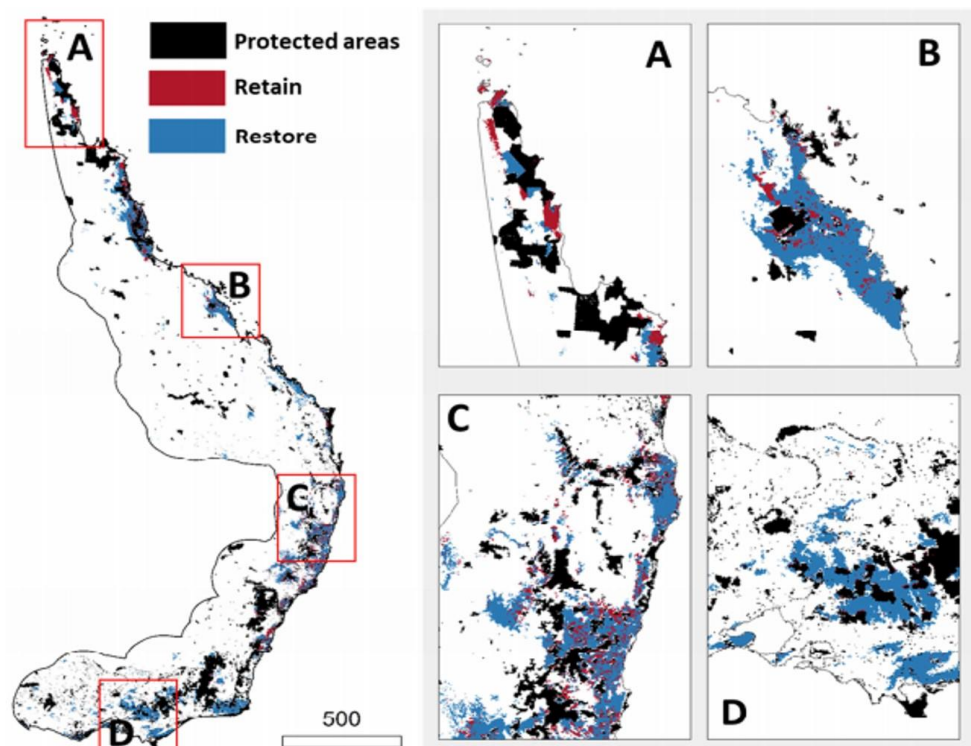
Factoring in climate change is changing our thinking on how we have been doing conservation, putting a greater emphasis on what we need to do to allow species to adapt. While climate-ready conservation strategies do emphasise many of the traditional conservation principles, they are also putting a greater focus on conserving ecological processes – such as ecological connectivity.

Climate change is also making us look how we conserve regions that will be important for species in the future, under a warmer climate. We know that, in the past, species withstood climate change by persisting in areas that remain climatically stable through time – called climate refuges.

Climate refuges

Another recent study has mapped climate refuges in south-eastern Australia by modelling future habitat locations for 1000 vertebrate species (Maxwell *et al* 2019). It also looked at what is required from a conservation point of view to secure those future important areas. It found that, under a high emissions scenario, by 2085 there will be no climatically suitable habitat for 26 species – 11 of which occur only in Australia. For other species, refuge areas (areas that remaining climatically suitable) exist but they are not necessarily on protected lands or land that is relatively intact – ie. they are on areas that are currently used for forestry or farming. 36% of refugial areas will need restoration to support climate imperilled species.

This map shows what this study says about the location of future refugia. Black is existing protected areas, red is areas with intact veg that we should look at retaining and blue is refugial habitat regions that are not intact – and will need restoration to act as vital habitat in the future.



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What is striking if we look at the inset D on the map – including where we are today - there is more blue than there is red... Much of this region could be important refugial habitat but it will require significant 'bolstering' through ecological restoration to act as such.

Research like this brings home the nature and the magnitude of the task ahead of us. It is a big one – and a very daunting one. It is one that is not unique to Australia. The UN has declared this decade the *Decade of Ecosystem Restoration* to stress that ecological restoration must be scaled up globally as it is essential to both fight species extinction and climate change.

The Alliance and this Symposium are the central Victorian communities' response to the task – to collectively work on the challenge and bring the best information to it. Today's Symposium is looking at how we do this - how we restore functional, diverse and resilient ecosystems through areas that will need to continue to support people and production– at the large-landscape scale climate change is demanding.

References

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Maxwell, Sean L., April Reside, James Trezise, Clive A. McAlpine and James E M Watson. (2019) Retention and restoration priorities for climate adaptation in a multi-use landscape. Global Ecology and Conservation Volume 18, April 2019, e00649. <https://www.sciencedirect.com/science/article/pii/S2351989419302434?via%3Dihub>