Landscape-level revegetation reverses the decline of woodland birds in agricultural mosaics

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Conservation and restoration in rural environments: a global issue

Photos: Andrew Bennett

Swiss rural landscape and wildflower strips sowed in farmland

Restoration and replanting in rural environments

- Multiple goals
  - land protection
  - shelter for stock
  - protect streams
  - reduce salinity
  - woodlots for timber

- Assumption – that it benefits native fauna

What are the benefits of replanting vegetation for woodland birds?

- Does ‘revegetation’ have benefits at the landscape scale?
  - are species attracted ‘back’ to these landscapes (a gain in species richness)?
  - is the composition restored?
- Is the trajectory of ‘recovery’ the reverse of the trajectory of ‘decline’?
- Does replanting add benefit to existing remnant vegetation?

Photo: Rohan Clarke

A landscape perspective

Study areas = ‘whole landscapes’, 8 km^2 (800 ha) across farmland region of >1.2 million ha, SW Vic. Three sets selected:

- **Remnant** vegetation landscapes (n=11)
  1.2 -19.2% wooded cover
- **Revegetated** landscapes (n=20)
  0.6 -19.1% wooded cover
- **Mixed** landscapes (n=12)
  1.7 -15.5% wooded cover

Photo: Alistair Stewart

Landscape selection

Low cover revegetation

High cover revegetation

Mixed cover vegetation

Red = remnant vegetation

Green = revegetation (planted)

Photo: Rohan Clarke

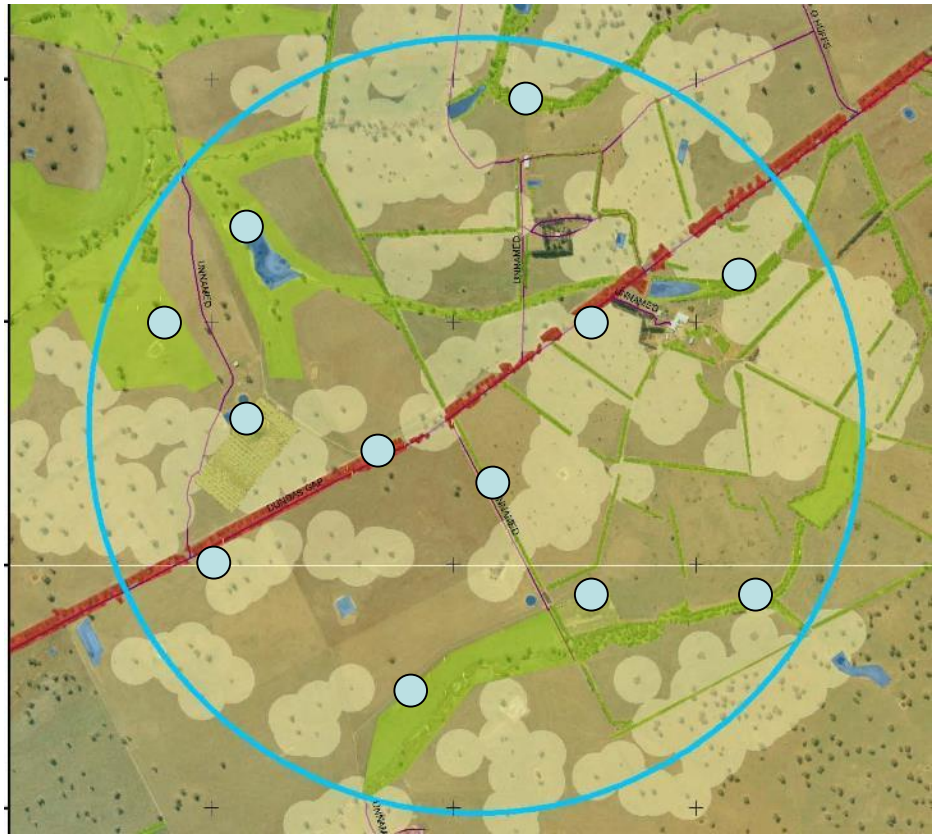
Farm pasture with scattered trees - low density, old trees

Sampling approach

- 12 sites per landscape
- Allocated to farm habitats
  - revegetation, remnant, wetland, open pasture, pasture with scattered trees
- 1 ha, 15 minute surveys
- Sampling over 12 months

  4 seasonal rounds

  total of 516 sites, 2064 surveys

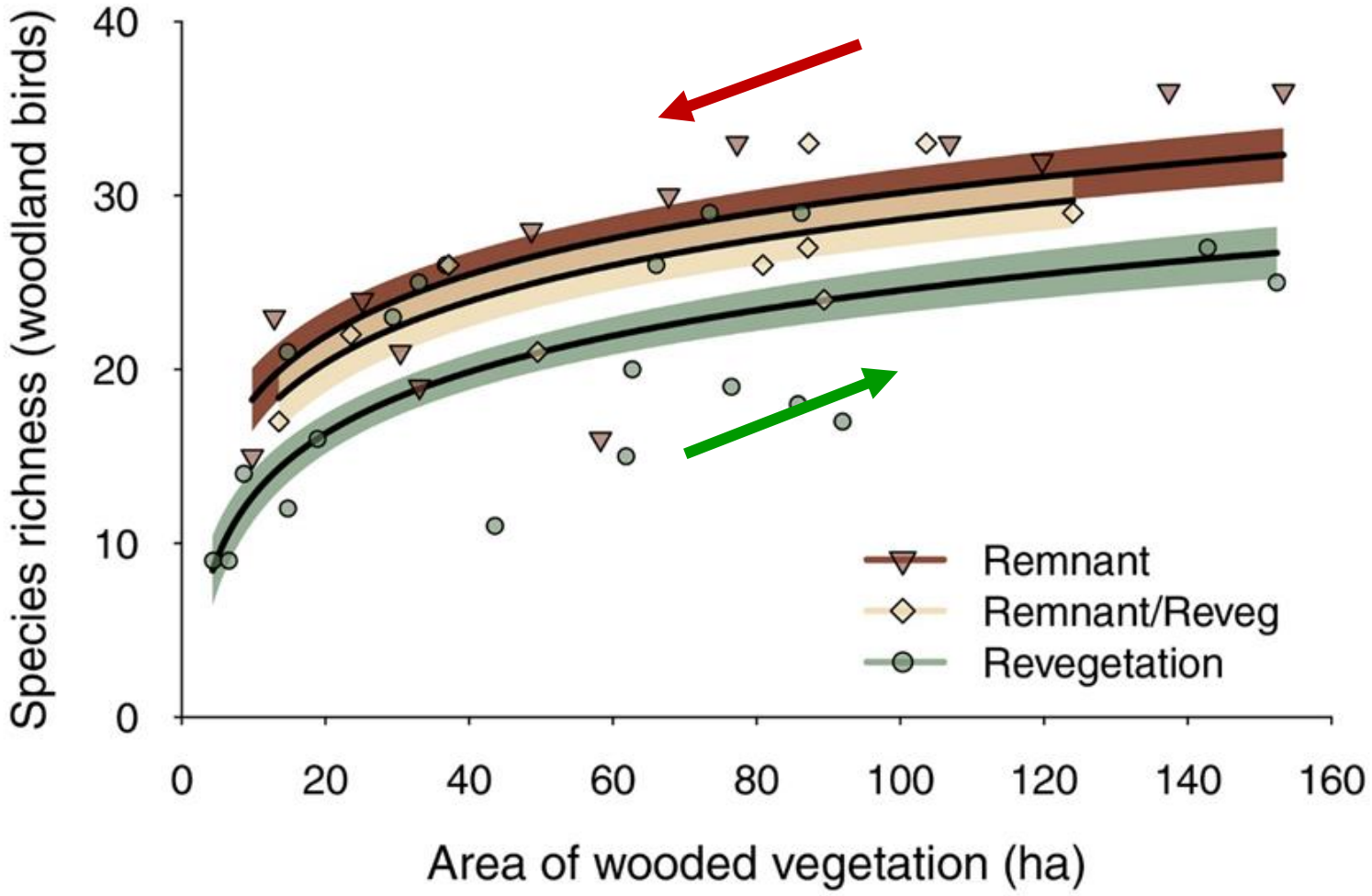


Birds in farm mosaics

- 152 species of birds recorded
- 60 species ‘woodland dependent’ (range 9 – 36 spp per landscape)
- 80% (48/60) woodland species detected in replanted vegetation sites

Photos: Rohan Clarke

Influence of amount of wooded vegetation on richness of woodland birds



Properties of landscapes

Amount of wooded (eucalypt) vegetation

Configuration of wooded vegetation
(number of patches, patch shape)

Landscape **composition**
(%revegetation, farmland with scattered trees,
length of streams)

Distance to **source** (>500 ha)

Climate (rainfall)

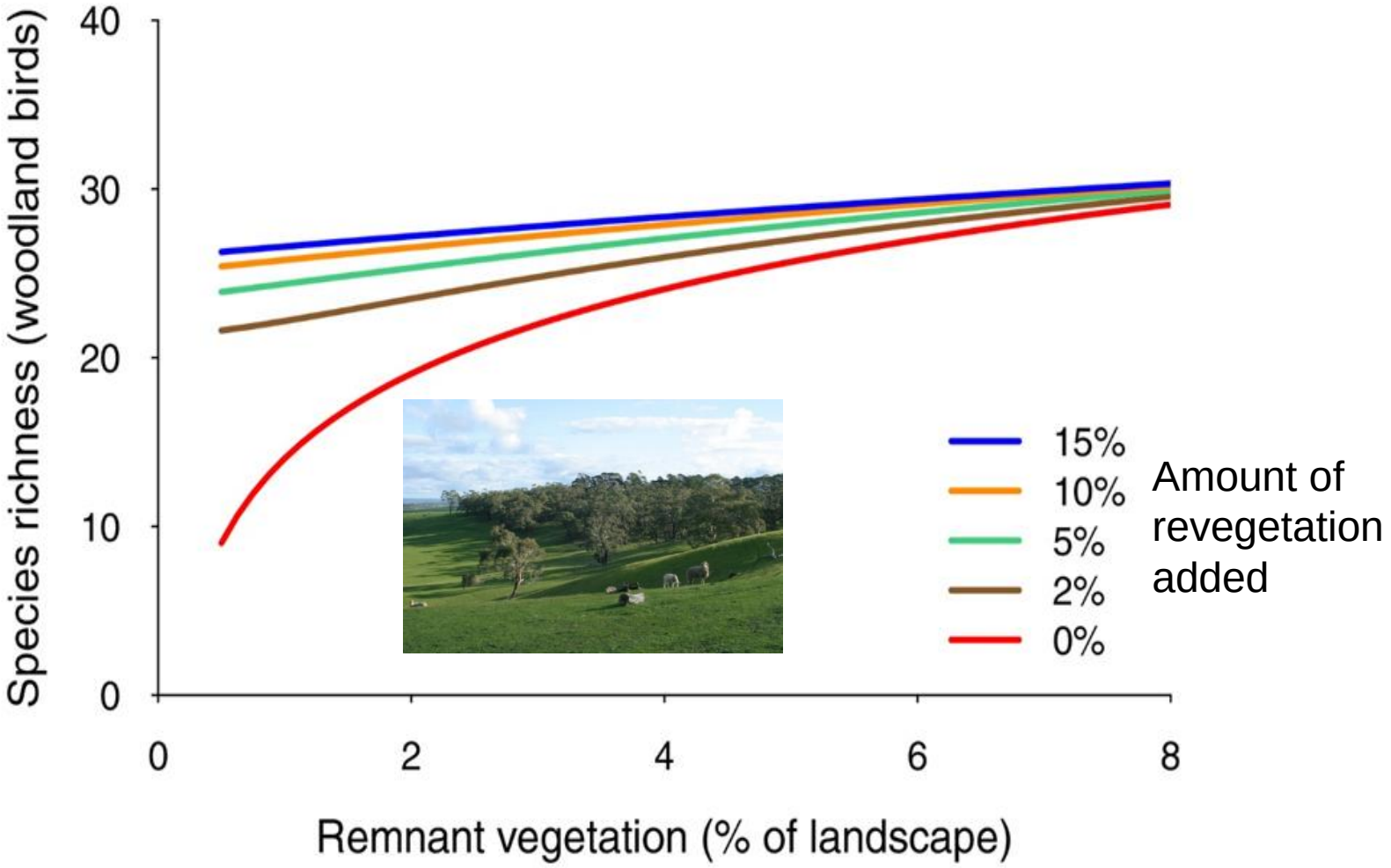
Predictors of species richness of woodland birds (43 landscapes)

‘Best’ model - 78% of variance

Key influences:

- Total amount of wooded vegetation
- %reveg (of wooded area)
- Scattered trees
- Rainfall
- Interaction: total wooded vegetation X %reveg

Interactive effects – the type of wooded vegetation matters



Influence of farmland with scattered trees

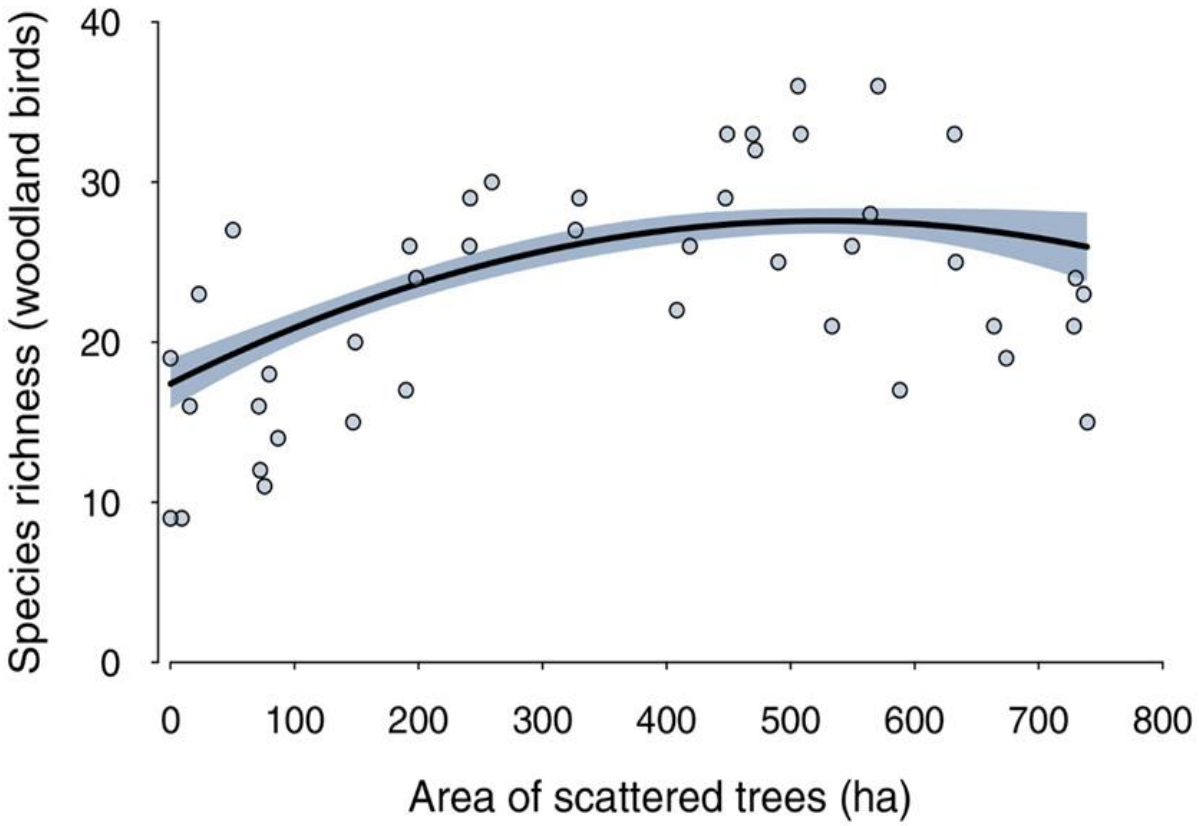
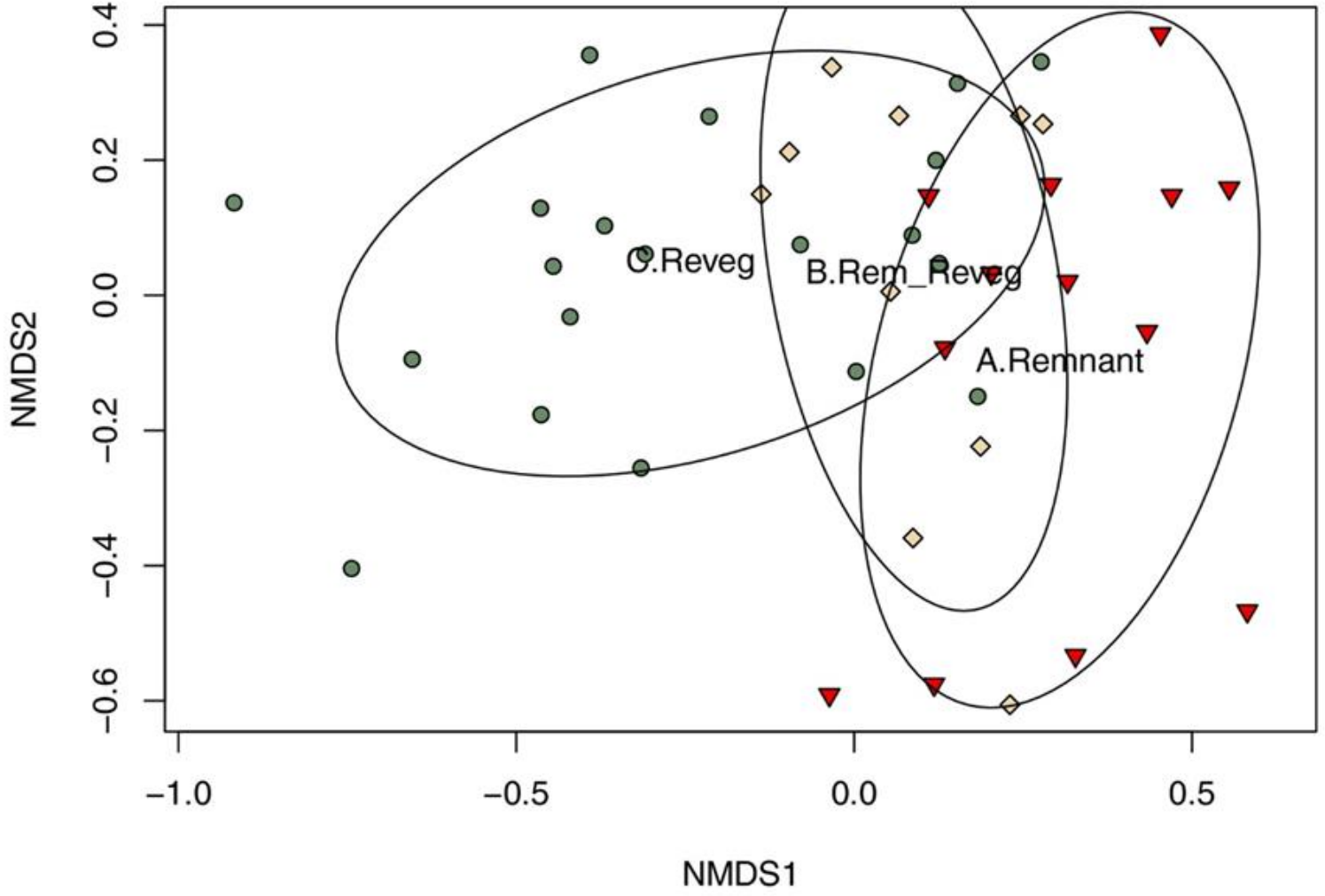


Photo: Rohan Clarke

Ordination of landscapes based on woodland species composition



Species that contribute to the difference:

More common in ‘remnant’ landscapes

- *Crimson Rosella*
- *Tree Martin*
- *White-throated Treecreeper*
- *White-plumed Honeyeater*
- *Brown Treecreeper*
- *Crested Shrike-tit*

More common in ‘revegetated’ landscapes

- *Superb Fairy-wren*
- *New Holland Honeyeater*
- *Brown Thornbill*

Brown Treecreeper

White-throated Treecreeper

Photos: Rohan Clarke

Conclusions

Revegetation does have conservation benefits at the landscape scale

- reverses effects of vegetation loss
- new species colonise
- builds more complex communities

Superb Fairy-wren

Trajectories of decline and restoration differ

- fewer species in revegetated landscapes
- compositional differences associated with key resources (old trees, shrubby layers)

Striated Pardalote

Photos: Rohan Clarke

Conclusions

Composition of agricultural landscapes is important

- farmland with scattered trees
- existing areas of remnant vegetation
- revegetation adds value to remnants

Photos: Rohan Clarke

Temporal processes influence restoration

- revegetation is young, requires time to mature
- scattered trees in farmland are disappearing

Individual actions have landscape-scale consequences (benefits/problems)

Thanks to:

- Glenelg Hopkins Catchment Management Authority
- More than 120 landholders
- Jim Radford, Glen Ehmke, Katrina Lumb, Joanne Henry, Annie Ouin & others

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Photo: Rohan Clarke

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