Conservation of the Mallee Emu-wren using ultra high resolution aerial photography

Image: www.google.com

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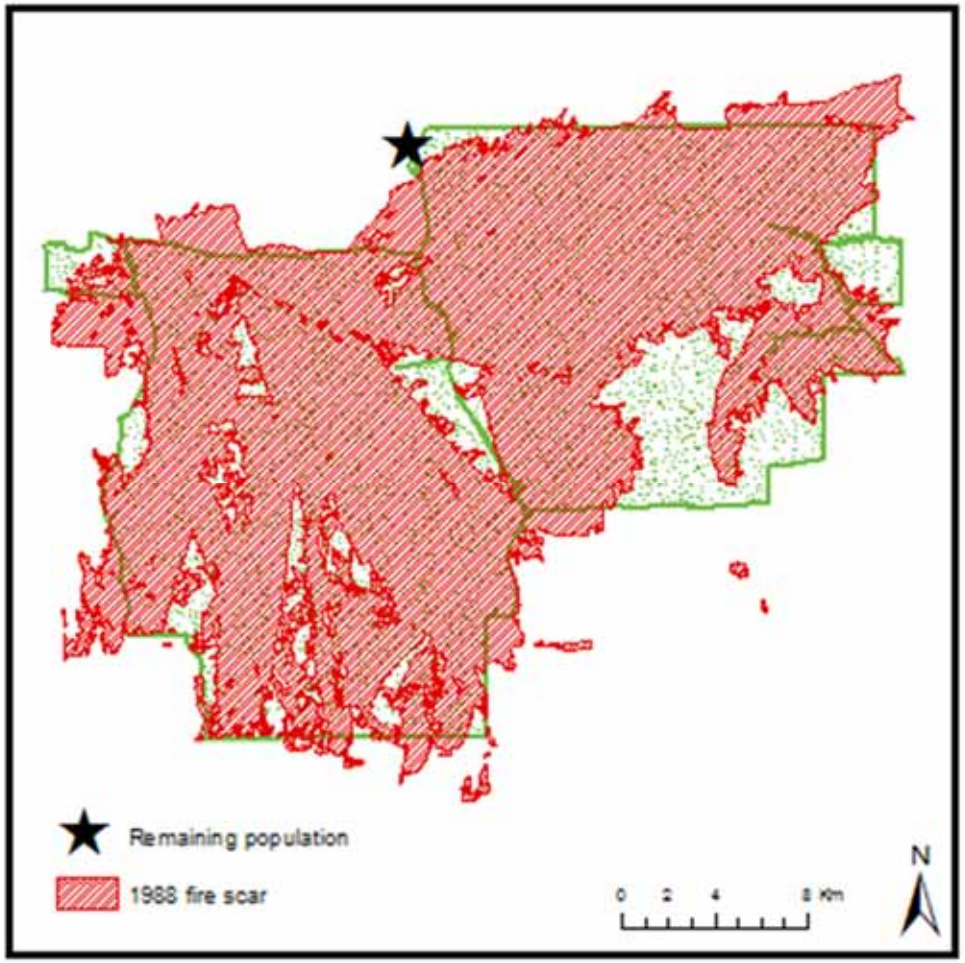
Mallee Emu-wren (*Stipiturus mallee*)

- Small passerine (~6 g)
- Insectivorous
- Habitat specialist
- Use *Triodia* and dense heaths for:
  - Foraging
  - Nesting
  - Protection
- Declining populations
- Endangered

Extent of occurrence

- Only found in remnant mallee
  - Murray Sunset (Vic)
  - Hattah-Kulkyne (Vic)
  - Big Desert (Vic)
  - Wyperfeld (Vic)
  - Ngarkat (SA)
  - Billiatt (SA)



Project aims

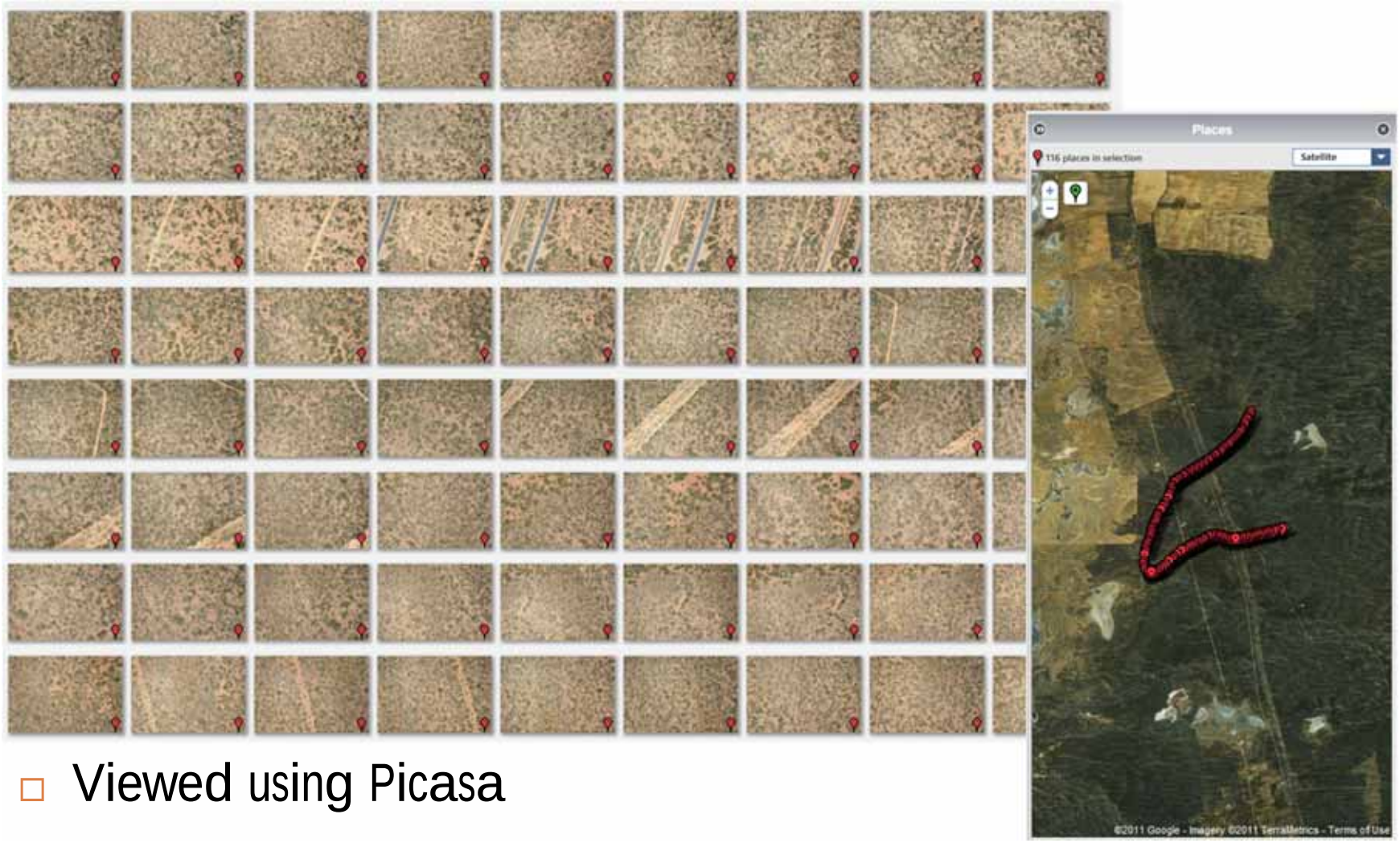
- Aim 1:
  Construct a habitat suitability model for the Mallee Emu-wren

- Aim 2:
  Locate potential translocation sites with high quality habitat within Billiatt Conservation Park

Aerial surveying

- Fieldwork not feasible given the remoteness of many of the sites
- Decision made to use ultra-high resolution aerial photography
  - Nikon D700 12.1 megapixel camera
  - Taking photos every second
  - Connected to GPS
- Flight covered known MEW sites in Victoria and SA
- Extensive surveying over Billiatt and Ngarkat CPs

Aerial surveying



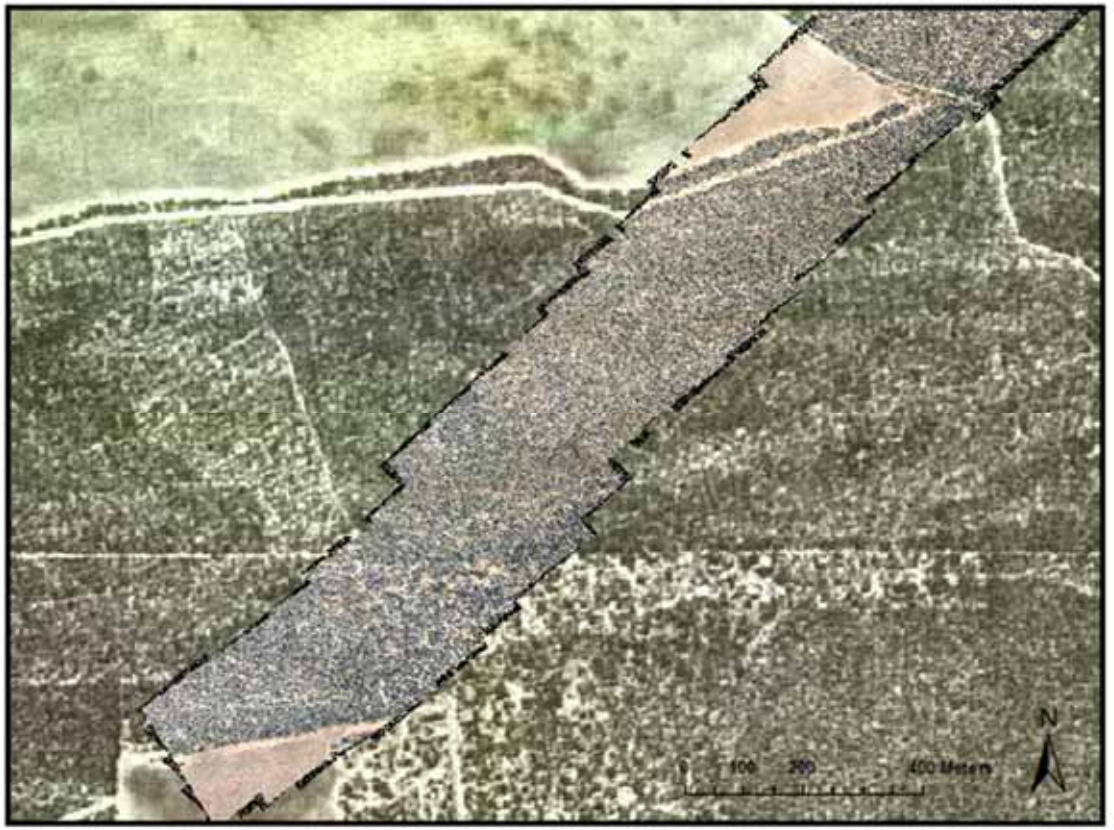
- Viewed using Picasa

Aerial surveying

- Photo stitching
  - Microsoft Image Composite Editor (ICE)
  - Capable of stitching up to ~40 images
  - Doesn’t compromise on resolution

Aerial surveying

- Georeferencing
  - Accounts for any distortion during stitching
  - 5-10 cm pixels



Aerial surveying

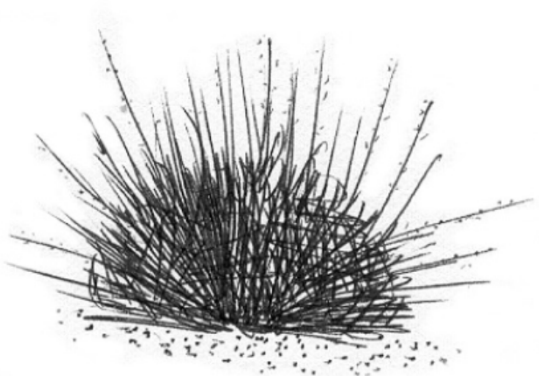
Aerial surveying

Aerial surveying

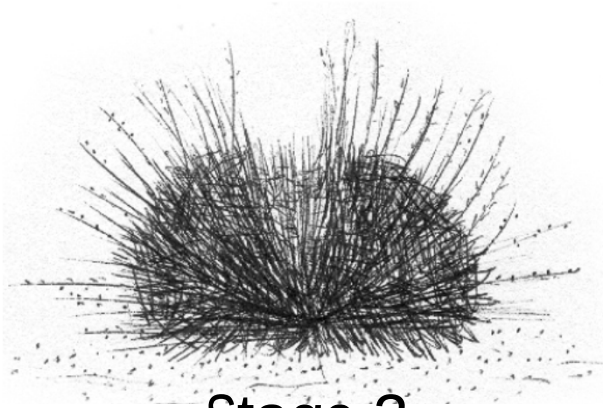
Aerial surveying

Aerial surveying – *Triodia*

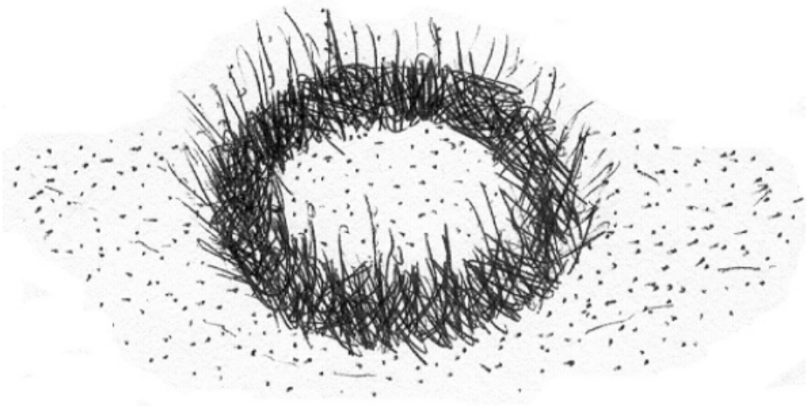
Stage 1



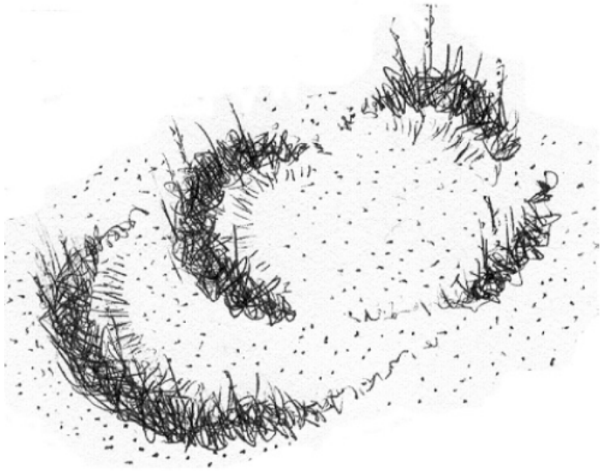
Stage 2



Stage 3



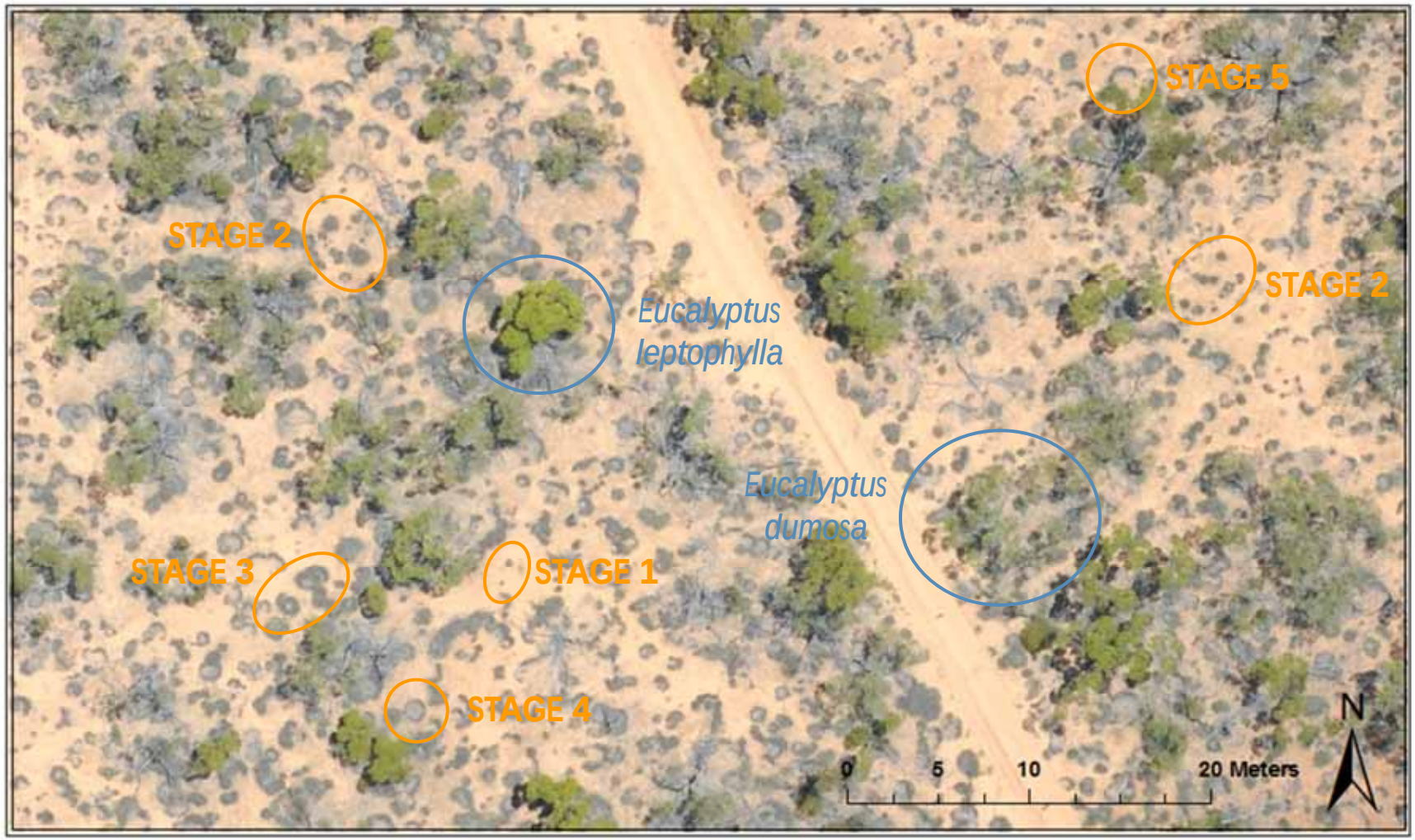
Stage 4



Stage 5

(*Churchill* 2001)

Aerial surveying – *Triodia*



Aerial surveying – *Triodia*

Hattah-Kulkyne National Park, Victoria

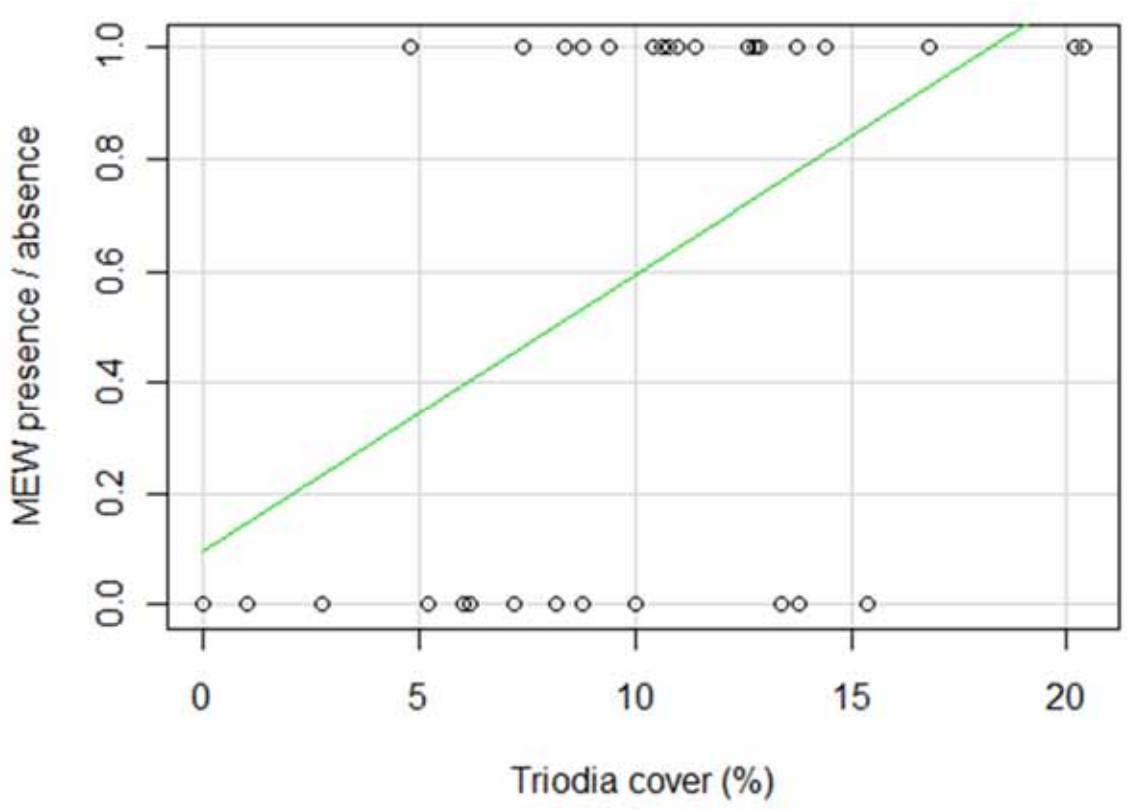
Habitat modelling

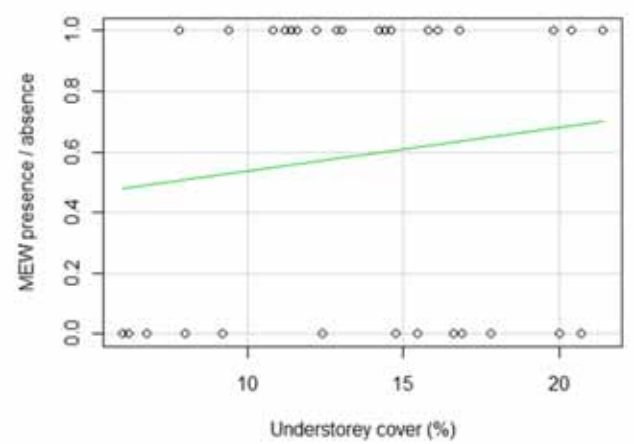
- Use known MEW locations in Victoria and SA
- Compare to where they are absent

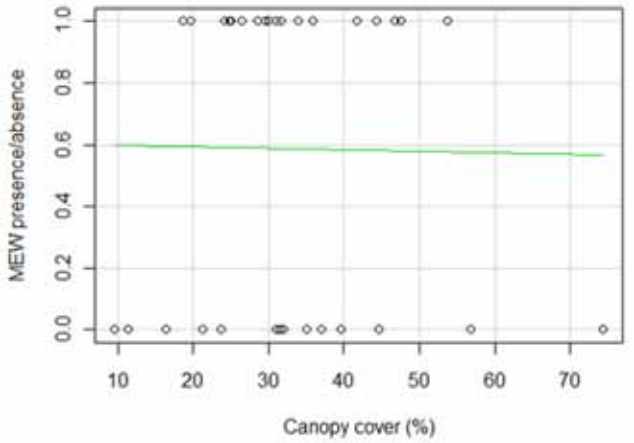
- Vegetation surveys on imagery
  - *Triodia* (cover, growth stage, size)
  - Understorey cover
  - Canopy cover

Habitat modelling

- Preliminary results







Habitat modelling – what's next?

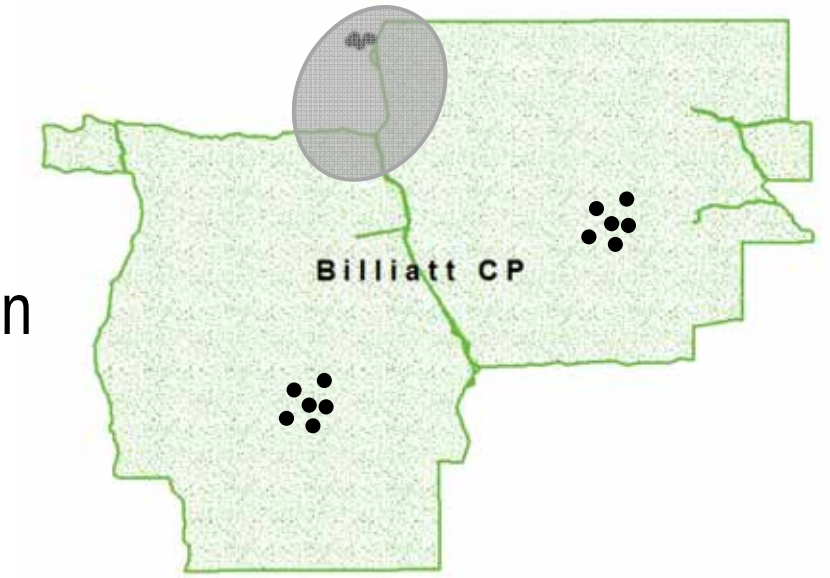
- Looking into how this ideal habitat can be predicted to "fill the gaps" between the aerial photos
  - Time since fire
  - Topography (aspect, slope)
  - Satellite imagery (including Wordview-2)

- Habitat suitability map for Billiatt CP

Translocation sites

- Identify areas of high quality habitat
- Assist with future translocation

- Reasons for translocation
  - Augment their population
  - Reduce the risk of extinction
  - I.e. from fire



In conclusion

- Outcomes of this research:
  - Provide insight into Mallee Emu-wren habitat
  - Aid in management, e.g. designing fire regimes
  - Assist in proposed translocation program
  - Increase MEW numbers
  - Reduce chances of extinction

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Questions…?