

Heathcote and surrounds *Walkshop*

Contrasting three different local landscapes in the broader Wild Duck Creek and Heathcote regional study area.

Sunday 14 April, 2019

Program and notes

Program	
9:00 am	Assemble at Heathcote Information Centre;
9:30 am	Depart in buses for first field site;
9:50 am	Arrive at Merindoc; Welcome to country and overview of day and local landscape; then walk into valley looking at biodiversity and sustainable land use in agricultural setting (landscape overview, soaks, remnant grassy woodland, connectivity, pasture management);
	Morning tea at Merindoc;
11:30 am	Depart for Spring Plains NCR;
11:45 am	Arrive and walk into valley and look at restoration of existing habitat in this case on public land (large trees, gully repair, thinning and burning etc.);
12:30 pm	Depart for Heathcote;
12:45 pm	Lunch – Heathcote (CWA) Senior Citizens Hall;
1:45 pm	Depart for Vaughans Lane;
1:55	Arrive at Vaughans Lane looking at Large Old Trees, dams, waterways, remnant vegetation and revegetation in largely non-agricultural private landscape
2:55 pm	Depart for Heathcote
3:05 pm	Arrive back at Senior Citizens Hall and debrief/next steps
~3:20/30 pm	Finish

This event is part of a process to develop a *Local2Landscape* plan to restore and reconnect the forests, woodlands and waterways in the Heathcote region. It has been sponsored by a City of Greater Bendigo Community Grant. Biolinks Alliance work is made possible through the generous support of the Helen Macpherson Smith Trust and a number of visionary private donors.

The landscapes we will be visiting today are:

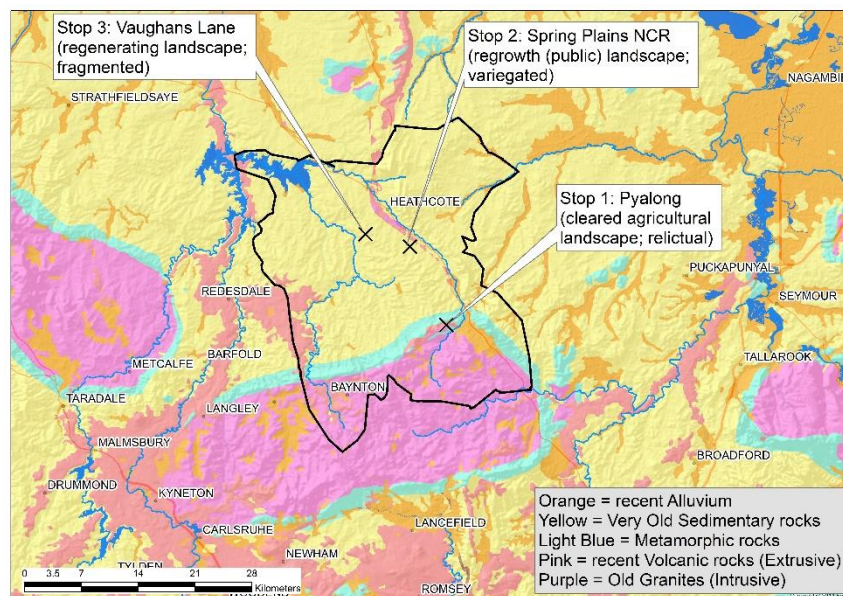
1. **Pyalong:** A more or less **cleared agricultural landscape (relictual)** with steep terrain and dissected drainage in the uplands at the margins of a the Cobaw Granites (and a metamorphic aureole); Used for stock grazing and generally not suited to other intensive land uses; Some isolated patches of threatened habitat such as springs and grassy woodland that could be habitat for threatened species;
2. **Spring Plains NCR:** A **regrowth landscape** (variegated) on a crown reserve that has been subject to intensive alluvial gold mining and firewood/timber harvesting before being converted to an NCR in the last 20 years; Box Ironbark vegetation that is habitat to Swift Parrot and other declining woodland birds and mammals;
3. **Vaughans Lane:** A **regenerating fragmented landscape** that was formerly broad acre agriculture before being more recently subdivided into vineyards, hobby farms and lifestyle blocks; Some isolated remnants and widespread regeneration and some revegetation; Mix of Box Ironbark (upslope) and grassy woodland (lower slopes);

The aim of the day is to visit each landscape to discuss how each functions (works) ecologically, the impacts of land use and future threats, what is needed to restore landscape health to prevent species extinctions and mitigate against Climate Change, and how this might be approached in practice and in the context of sustainable land uses.

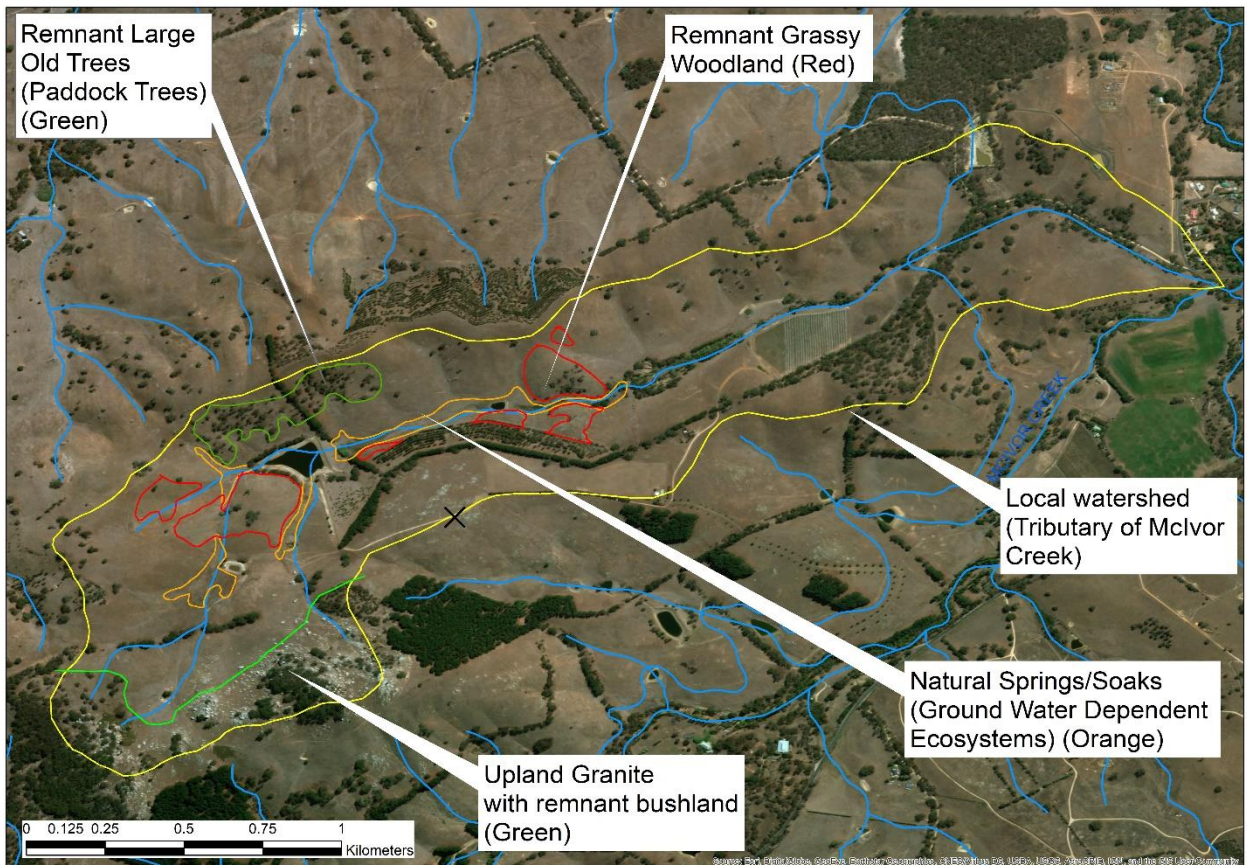
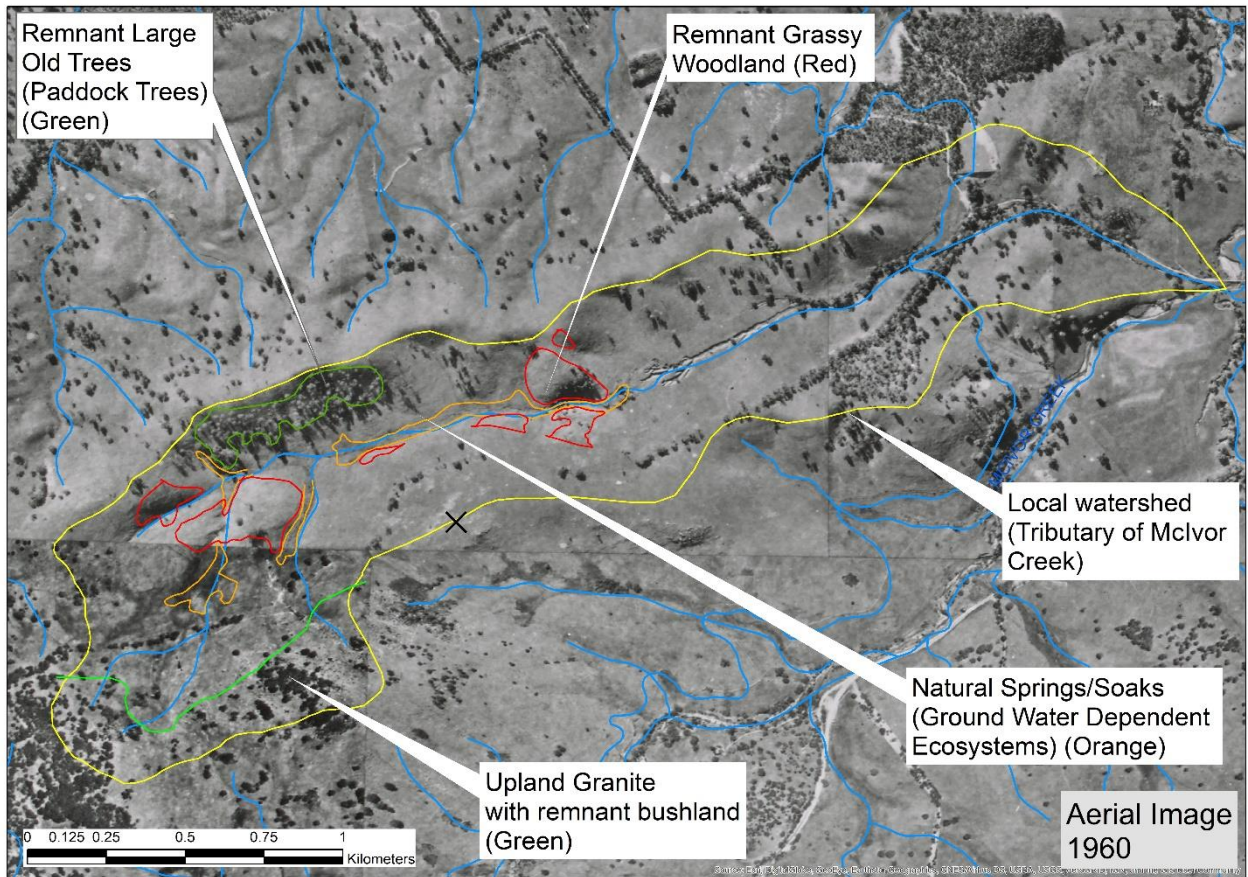
Biolinks hopes to work with the local community to develop and implement at least one landscape scale restoration project based on principles discussed and the development of a shared long term vision of landscape repair, biodiversity conservation and sustainable land use.

Themes of the day:

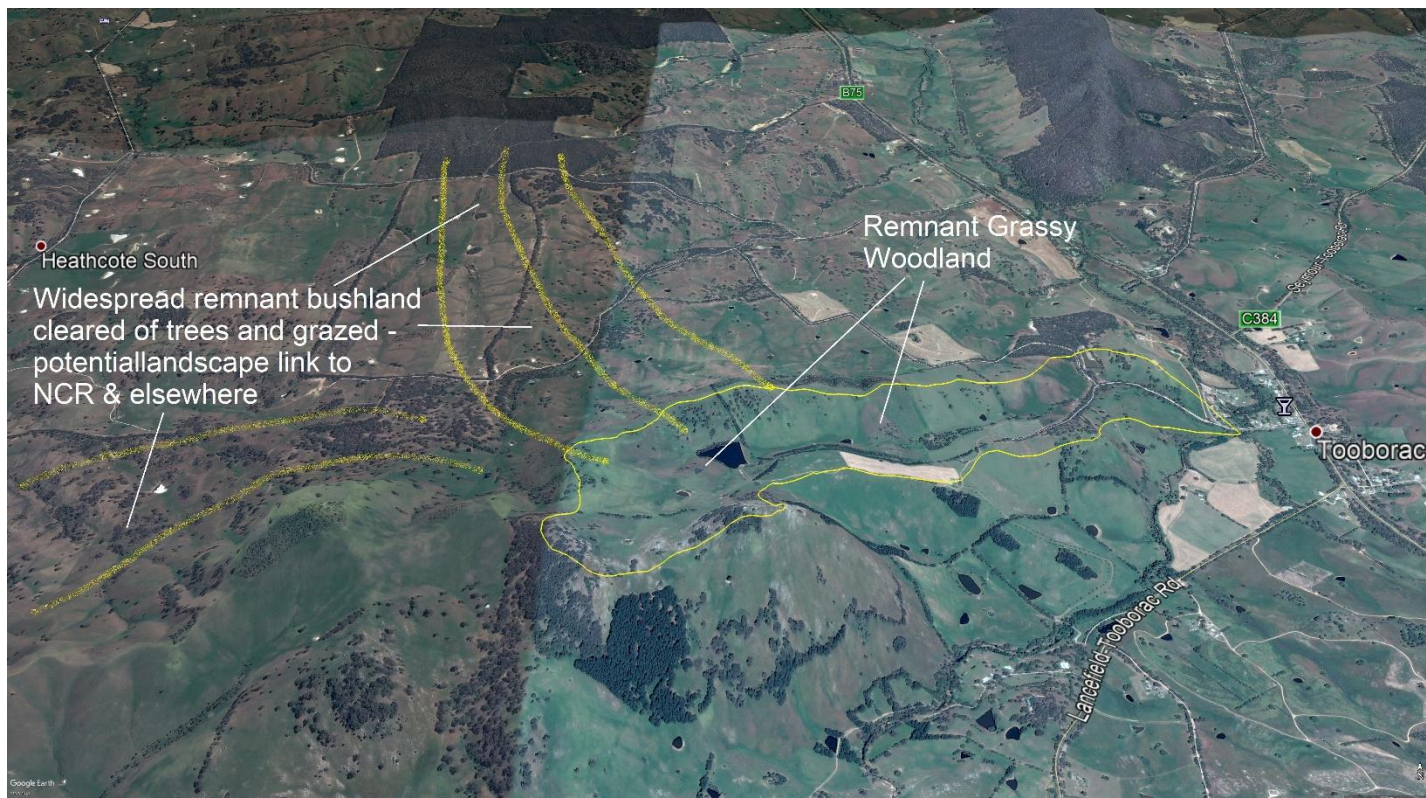
- Incorporating Indigenous perspective;
- Recognising and restoring biodiversity;
- Reading landscape patterns and processes (e.g. hydrology and groundwater; connectivity, productivity etc.)
- Regenerative agricultural – integrating humans and nature; and
- How to achieve change and practical solutions



PYALONG



PYALONG CONNECTIVITY



SPRINGS PLAINS NCR

Box Iron Bark Forest – condition images



1861 image of Red Ironbark bushland – showing the thick undergrowth – fringing Sandhurst’s newly constructed Reservoir No. 7 not far from the present day Crusoe Reservoir only ~4 kms to the south;

Source: Russell, G. (2009). Water for Gold – The fight to quench Central Victoria’s Goldfields. Australian Scholarly Publishing, North Melbourne.



Image Sept 2012 nearby in Bendigo Regional Park showing some rare pockets of this bush with rel. diverse understories still remain (Living Benchmarks)



Typical understory condition in much Box Ironbark Forest today – People have become used to the sparse, impermeable, litter dominated ground layers with just regrowth trees.



Fuel reduction burning in Bendigo Regional Park, fringing Kangaroo Flat – A process that is further reducing understory abundance and diversity, inc. soil and water loss, and “destroying” fauna habitat (insert)

Box–Ironbark Ecological Thinning Trial: Executive summary

Ref: Palmer GP., Brown GW., Gibson MS., Pigott JP., Tolsma AD., Wainer, J. & Yen AL. (2010). Box–Ironbark Ecological Thinning Trial: Integrated Analysis and Projected Changes. *Parks Victoria Technical Series* No. 58. Parks Victoria, Melbourne.

In 2002, Parks Victoria established a management-scale experiment to examine the effectiveness and feasibility of ecological thinning as a means for restoring Victoria's Box–Ironbark forests. The Box–Ironbark Ecological Thinning Trial (the Trial) took an adaptive experimental management approach to investigate how ecological thinning may be used to restore a greater diversity of habitat types to the Box–Ironbark landscape and therefore allow improved functioning and persistence of key communities and species populations.

The Trial was implemented in four Parks Victoria reserves (the Sites) in the Box–Ironbark region of central Victoria (Castlemaine Diggings National Heritage Park, Pilchers Bridge Nature Conservation Reserve, Spring Plains Nature Conservation Reserve and Paddys Ranges State Park). At each Site, treatments with varied rates of tree removal and retained patchiness (Control, Isolated Patchy 1 and Patchy 2) were implemented in 30-ha Plots. Within these Plots, three coarse-woody-debris manipulations were applied: 100% removal; 50% retention; and 100% retention of bole material.

As part of the Trial, a research and monitoring program (Phase 1), focusing on forest structure, selected biodiversity elements and habitat features, was established to examine the impacts that ecological thinning and the different experimental treatments had on key components of Box–Ironbark forests. This report documents the experimental design, the pre- and post-thinning monitoring results of selected biodiversity and habitat attributes across all Sites and discusses the implications of these results and their potential future trajectories. As the Trial used an adaptive experimental approach, changes or additions to the ongoing monitoring design to enhance outcomes are also discussed.

Before ecological thinning commenced, Plots were dominated by high numbers of coppice-generated trees (up to approximately 1500 stems per hectare). Less than 3% of trees were considered large (>60 cm diameter) and only 3% were hollow-bearing, implying limited availability of habitat for a number of threatened fauna. Pre-thinning, Plots contained very small amounts of coarse woody debris, particularly large pieces (>10 cm diameter).

As a result of ecological thinning:

- **Stem density** was significantly reduced;
- **Mean stem diameter** increased;
- **Coarse woody debris** increased across all thinned Plots, including significant increases in large pieces of coarse woody debris;
- Changes to other habitat features post thinning, including **fine debris**, were measurably higher than pre-thinning values;
- Vegetation responses to thinning included **increased herb and tussock-grass cover**;
- **More profuse flowering of herbs and shrubs**;
- There was also a **decrease in perennial-shrub cover**;
- An initial, probably temporary, **increase in annual weed grasses**.
- Among vertebrate fauna, thinning affected the occurrence of **some diurnal birds** as well as **some other vertebrate groups**;
- **Species richness was greater among bird assemblages** (esp. understory birds) after thinning, although this may have been influenced by the timing of surveys;
- **Bat activity was greater** in Plots after thinning;
- Other vertebrates, including **terrestrial and arboreal mammals**, appeared to remain stable or displayed **positive responses**; and
- Ground invertebrate assemblages were dominated by ants in species richness and total abundance, which in turn were dominated by a small number of **opportunistic ant species which responded positively** to disturbance associated with thinning.

The results presented in this report document the pre-thinning conditions and initial post-thinning conditions and provide a benchmark for the ongoing monitoring of the Trial. These results have been used to predict the future trajectories of biodiversity and habitat features for the Trial. As such, this report will make an important contribution to the future management of Victoria's Box–Ironbark parks and reserves system.

Table 3. Descriptions of stem density and patch retention at the four ecological-thinning treatments in the Box–Ironbark ecological-thinning Trial (taken from Pigott *et al.* In Press).

Treatment	Procedure
Control	No thinning treatment is applied (i.e. no trees are cut or removed)
Isolated	Density: Trees selected for retention to establish a predetermined density considered to represent moderate density. Pattern of retention: All stems (within the estimated 'zone of influence' of the selected stem) are felled to a basal area equivalent to 50% pre-thinning status. None of the experimental area is retained unthinned.
Patchy 1	Density: Trees selected for retention to establish a predetermined density considered to represent low density. Pattern of retention: Patchy, with stems retained to a level of 25% of pre-thinning basal area after thinning (as for Isolated); 10% of experimental area is retained unthinned.
Patchy 2	Density: Trees selected for retention to establish a predetermined density considered to represent moderate density. Pattern of retention: Patchy, with stems retained to a level of 50% of pre-thinning basal area after thinning (as for Isolated); 25% of experimental area is retained unthinned

One of four trial ecological thinning locations in Central Victoria – Spring Plains NCR:

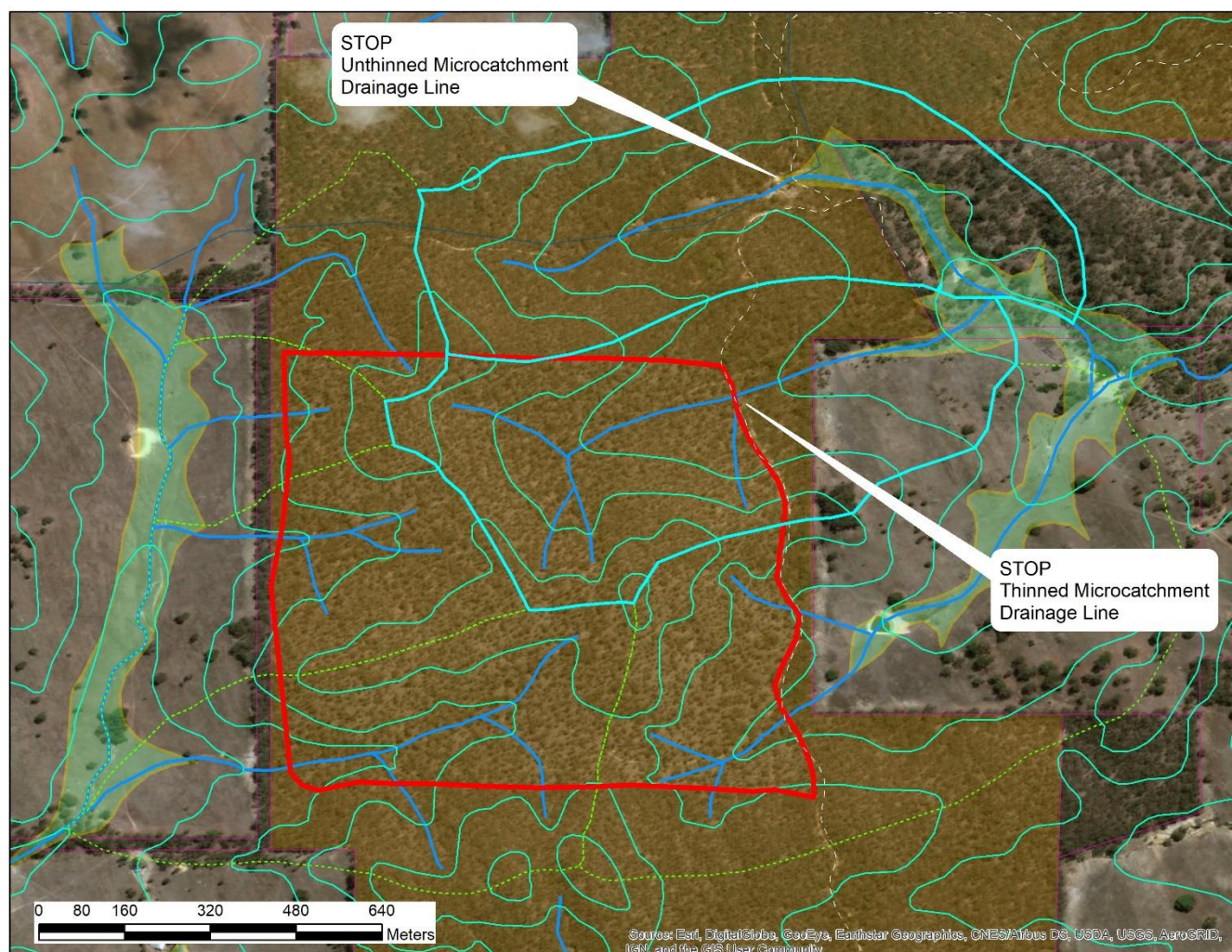
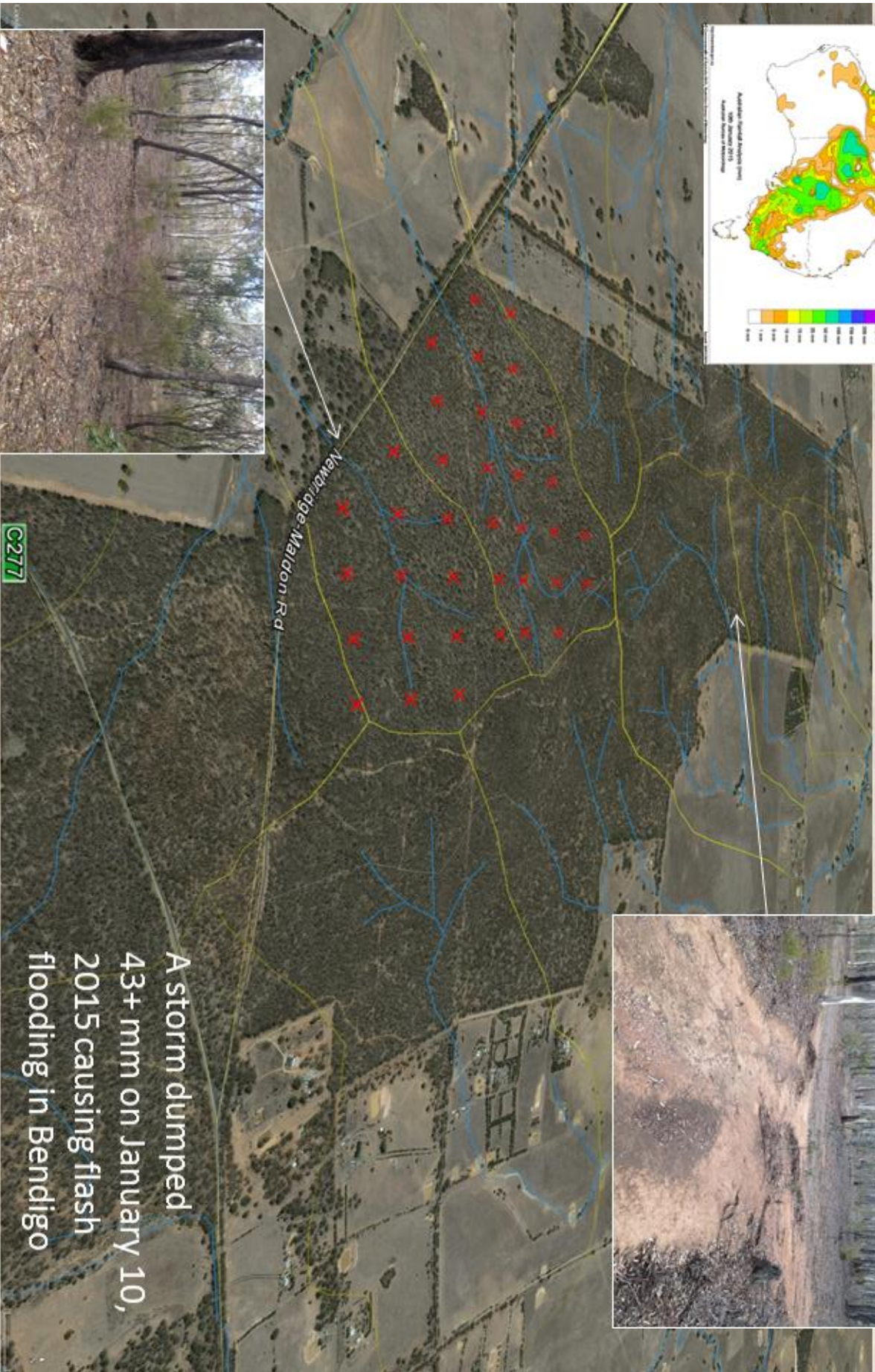
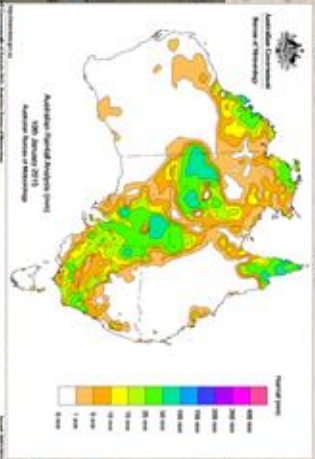




Image of Spring Plains ecological thinning trials which commenced in 2002 – key results included inc. tree growth rates, more habitat on the ground and improvements in the abundance and diversity of understorey plants.



Example of community driven ecological thinning trial at Shelbourne near Bendigo – Planning at a “landscape scale”, this project showed additional benefits in terms of greater water retention (see next slide)



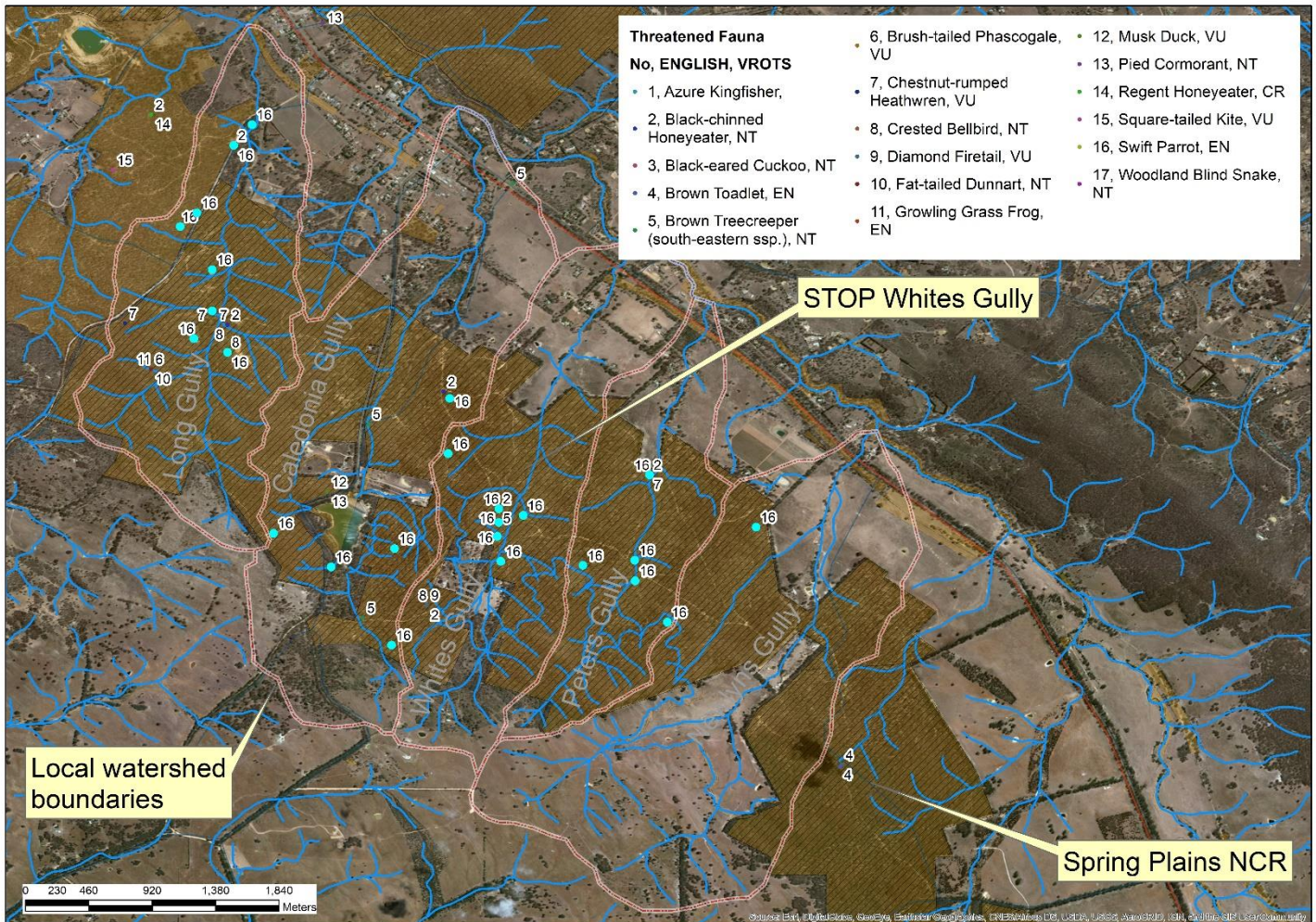
A storm dumped
43+ mm on January 10,
2015 causing flash
flooding in Bendigo

Less leaky, more productive landscapes

C277

Newbridge-Maldon Rd

SPRINGS PLAIN NCR - significant swift parrot habitat



VAUGHANS LANE, HEATHCOTE

