



On-farm Value of Biodiversity Through Sustainable Agriculture Practices



Danny Pettingill
Loddon Plains Landcare Network
facilitator@lpln.org
0490 412 430



I would like to personally acknowledge the Traditional Owners and custodians of this country and the land on which we meet today.

I acknowledge the rich living cultures, traditions and connections of Aboriginal and Torres Strait people their intrinsic connection to the land that we live and work on and pay my respect to Elders past, present and emerging.

I'd like to particularly acknowledge the Dja Dja Wurrung, Barapa Barapa and Wemba Wemba people, Traditional Owners of the land on which I live and work and I extend it to the lands on which you are today and acknowledge the people and culture of that place.



MANAGING FOR HEALTHY LANDSCAPES AND BIODIVERSITY



How do we look at a Landscape?

How do we think about management in a systems based or long term stewardship approach?

What does it mean to assess and manage for landscape health on a catchment and micro catchment scale?



By understanding the requirements of a landscape through observation and basic or developed monitoring practices we are provided decision-making tools to create systems that are more resilient and productive for farming and biodiversity.

By identifying different requirements, assets and areas on farm, we can think through the management requirements provide systems based solutions for more productive landscapes and enterprises

DEVELOPMENT OF THE READING LANDSCAPES PROGRAM



Monitoring can be as simple or advanced as the user would like.

- Regardless of simplicity, recorded data can provide a powerful decision making tool
- READING LANDSCAPES provides a way of adopting a system to assess landscape for management and decision-making in:
 - understanding your landscape
 - maintaining cover
 - managing for biodiversity
 - carbon
 - ground cover
 - stock management
- Key aim is to provide an entry to the journey towards understanding landscape and a beginning toward adoption of sustainable or regenerative practices.
- Initial project includes five sites in central Victoria with different land management priorities and methods

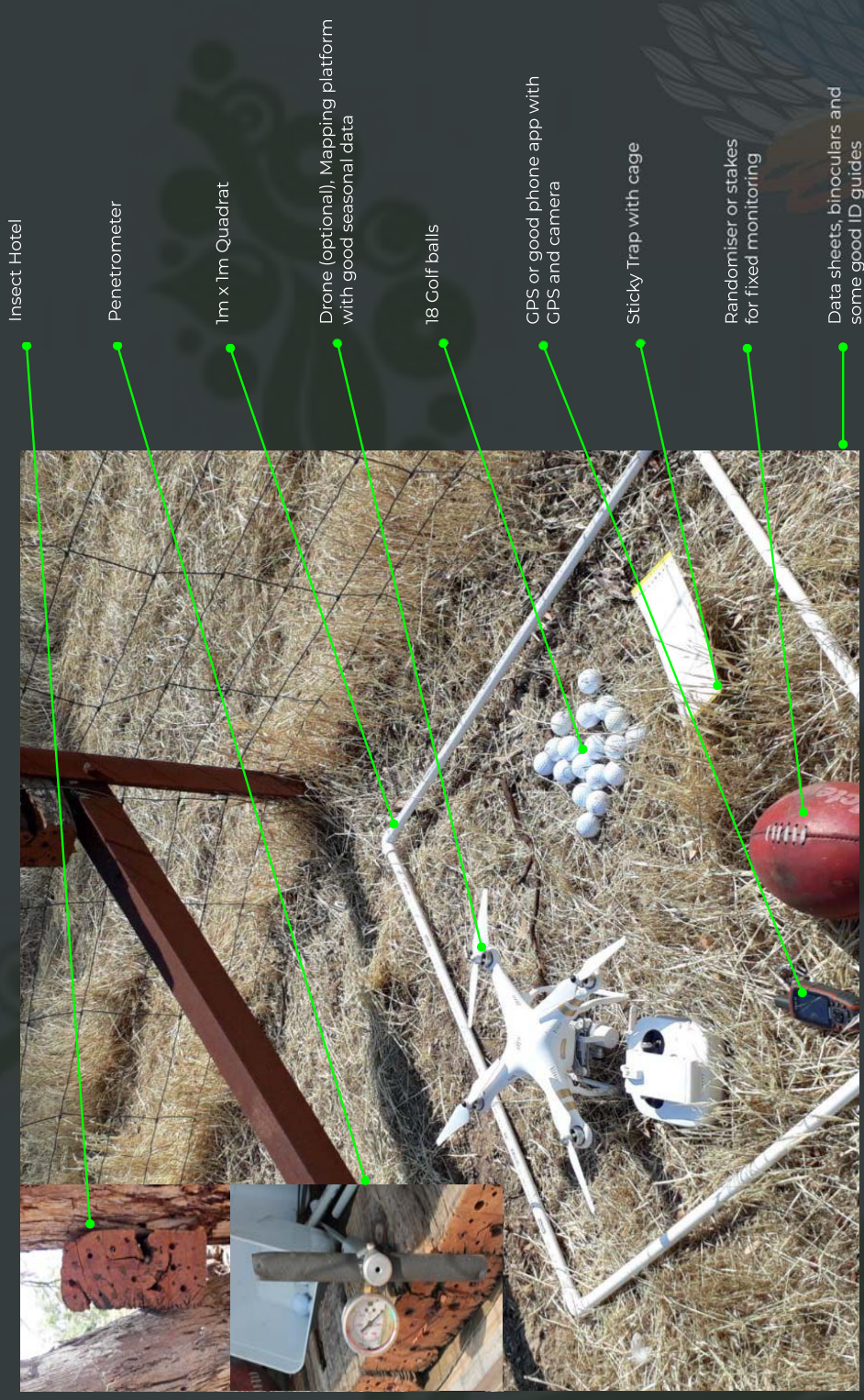
i.e cropping, forestry, rotational grazing, set stock grazing, trials or new adoption of alternative farming practices, 'leave it alone' conservation.

TOOLS IN THE TOOLKIT

- READING LANDSCAPES project called upon a number of elements including:

- Penetrometer readings
- vegetation/grassland score
- Native pollinator habitation
- Abundance of small invertebrates
- Abundance of bird species (20 minute, 2 Ha)
- Plant community make up through observations
- Landscape imagery (drone)

- Data collected is tabulated to look at links between these measurements, each being attributed an index score or average.



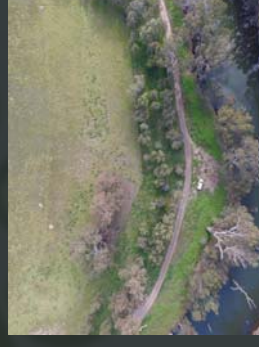
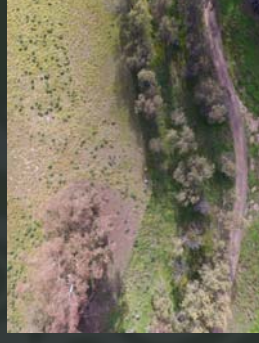
COLLECTING INFORMATION



Hotel data provides an indication of bore habiting native pollinators. **Traps** are employed to provide an indication of small invertebrate abundance. This is broken down into body shape to provide an indication of species abundance and an overall average is taken for invertebrate diversity.

Nesting and occupancy behaviour is observed through use of clear tubes in allocated hotel niches.

Drone data, provides picture of vegetation cover across seasons at 10m, 25m, 50m and 100m. This data provides a picture of land use, water movement and stock movement allowing for design of appropriate land stewardship approaches to provide improved outcomes for biodiversity and enterprise.



Golf ball monitoring (Nick Schultz et al.) provides a consistent score system in evaluating vegetation cover and height, **Penetrometer** data provides an indication compaction and potential for moisture retention. A **moisture meter** is used to provide an index value between 1 and 8.

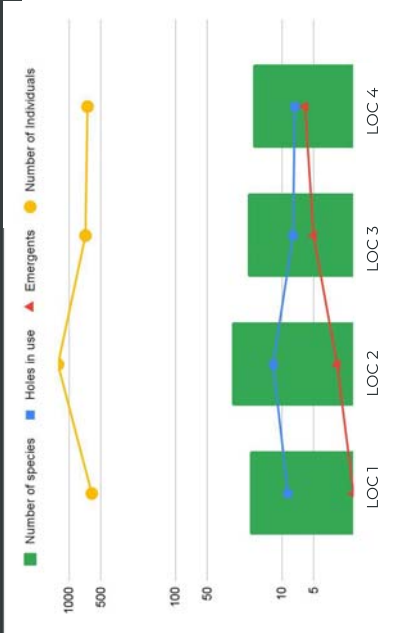
LOOK AT BOTH SIDES OF THE FENCE

Each side of the fence can often have different techniques or management priorities, looking at both side can provide good information for advancing stewardship techniques..

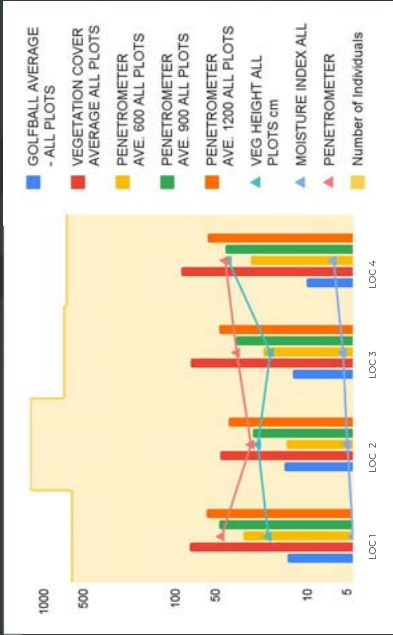


EMBRACE THE NUMBERS

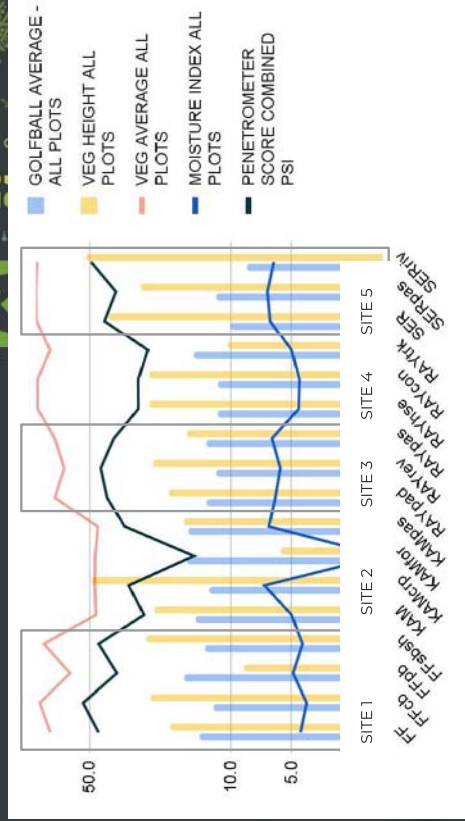
Invertebrate monitoring - by location



Overall data averages - by location



Project Averages, vegetation and soils - site breakdown



SITE 5

SITE 3

SITE 1

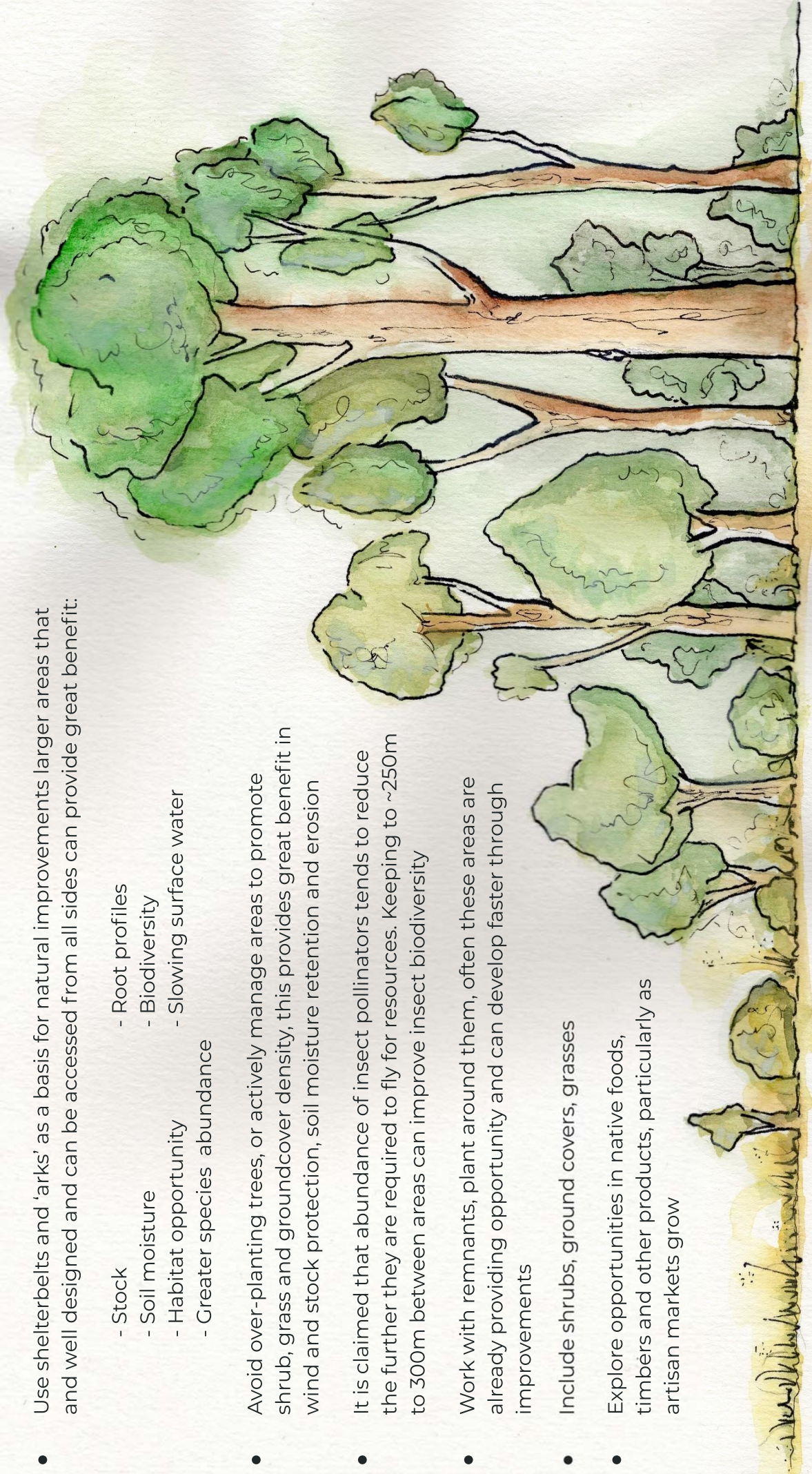
SITE 4

SITE 2



PLANNING FOR BIODIVERSITY

- Use shelterbelts and 'arks' as a basis for natural improvements larger areas that and well designed and can be accessed from all sides can provide great benefit:
 - Stock
 - Soil moisture
 - Habitat opportunity
 - Greater species abundance
 - Root profiles
 - Biodiversity
 - Slowing surface water
- Avoid over-planting trees, or actively manage areas to promote shrub, grass and groundcover density, this provides great benefit in wind and stock protection, soil moisture retention and erosion
- It is claimed that abundance of insect pollinators tends to reduce the further they are required to fly for resources. Keeping to ~250m to 300m between areas can improve insect biodiversity
- Work with remnants, plant around them, often these areas are already providing opportunity and can develop faster through improvements
- Include shrubs, ground covers, grasses
- Explore opportunities in native foods, timbers and other products, particularly as artisan markets grow



READING LANDSCAPES ADOPTION FRAMEWORK

PROJECT FRAMEWORK

The development of this framework starts with identifying primary drivers for 4 main project outcomes:

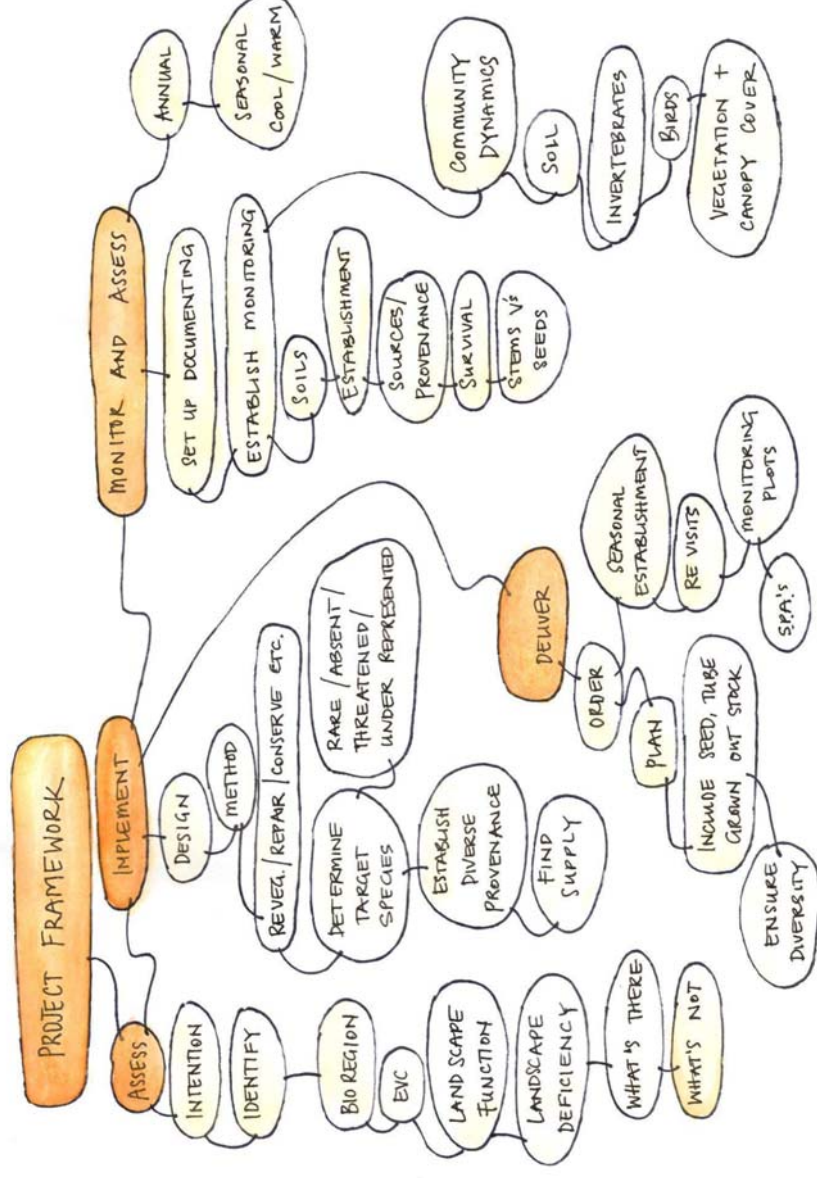
Landscape Assessment; Recognise intentions, landscape assets, requirements of landscape function and what within the landscape is under represented, absent or required in order to restore function to the landscape.

Implementation; Understand design parameters, methods for delivery, requirements for landscape (reveg. repair. conserve. restore etc.), select target species for the state of the landscape with an aim to establish opportunity for greater community dynamics in time.

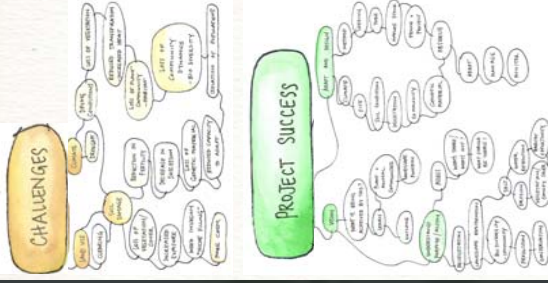
Deliver; Deliver the outcomes with a clear long term vision and goal ensuring that design and delivery builds in landscape function restoration qualities or, if allowable, focusing on rare, absent and threatened species.

Monitor; build in continual monitoring in order to understand what is working, adapting to what is not (including provenance and species diversity) and ensuring community dynamics and diversity are increasing.

- Design and long term establishment
- transferable across stewardship outcomes and systems
- Developed to provide flexibility in decision making for enterprise and biodiversity outcomes.



Artwork by Dayna Morrissey



PLAINS PLANT SELECTION MATRIX

	Common Name	classification	EVC	Garden	KL	DH	KW	Primary use	Forestry Firewood	Try Industry use - furniture or artisan	Boggy	Food plant	Ornamental/garden	Half/urban gardens	Revegetation	rt/salinity indicator	Suit small garden	Bird Attracting	Food and insect storage	Water species	Fodder
1	Acacia mangium	T	0	1	1	1	1	1	1	2	1										1
2	Acacia melanoxylon	T	0	1	1	1	1	1	1	1	1										1
4	Acacia saligna s.l.	MS	1	1	1	1	1	1	1												
5	Acacia dealbata	T	1	1	1	1	1	1	2	1	1										1

How can we support the framework and assist in plant selection for landowners and other land managers?

Brings together 300 plant species in central Victorian Goldfields and Riverine bioregions plus common species used for agriculture applications

- fodder, forestry, shelter etc.

Provides a guide for planting and species selection through ~20 attributes

- Pioneers
- Habitat builders
- Secondary farm income & fodder management
- Food source
- Salinity
- Erosion
- Water table
- Soil condition

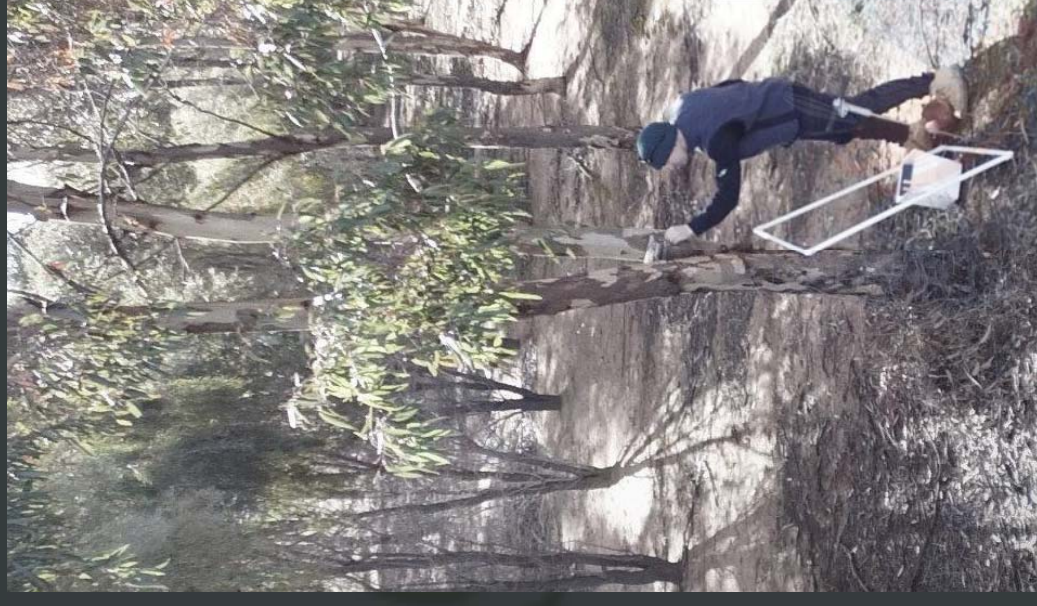
Allows users to select plants according to landscape and function requirements providing a guide for appropriate project development and encouraging greater species depth

KEY TAKEAWAYS

- Landscapes vary, understand how it's functioning on catchment and micro catchment scale, how it needs to function in a farm system, what it needs to achieve (enterprise)
- Important to know what you are managing and set goals to achieve good landscape outcomes for function and resilience
- Decision making tools provide vital frameworks that allow adaptive management systems to be developed for long term resilience
- Perennials are great, well profiled root systems and year round food sources are just as important
- Design a root profile
- Utilise dense strata plantings in wide, connected shelterbelts.
- Design 'arks' ~200m apart, 50m wide to encourage opportunities for invertebrates, woodland birds opportunities decrease as flight distances increase
- Link between soil management and opportunities for biodiversity is vital to functioning ecosystems

Healthy soils provide foundations for

biodiversity, landscapes function, moisture retention, resilient landscape systems



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