

# THE RIVER COUNTRY BIOLINK GUIDE

## Regeneration in Action:

A conceptual plan for a hydrated biolink product for environmental markets



Sheep Wash Lagoon, Gonn /Enviro Media



INNOVATE TO  
REGENERATE



Mulloon Institute  
For environment, farming and society.

REGEN



Murray Darling  
Wetlands  
Working Group



Local Land  
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# Acknowledgements

We acknowledge the Barapa Barapa and Wemba Wemba people, Traditional Owners of the River Country Biolink area and surrounding country; and thank Ant Jones for sharing both his traditional and technical knowledge and his late mother Margaret Jones' *Medicines and Food of Wamba Wamba Country* guide.

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# Introduction

The River Country Biolink Guide is designed to inspire both discussion and action towards regeneration of the Murray River inland delta.

The emergence of markets in carbon sequestration and biodiversity restoration (nature repair) coupled with supply chain responses to global changes in accounting for impacts on the climate and the natural world herald an enormous shift in business rules.

Farmers, as land stewards of 55% of the Australian land mass and primary producers at the top of the value chain, are inextricably tied to the challenges and opportunities the changing market dynamics will present.

Farming communities in the Murray River inland delta, have already experienced market failure of a natural resource<sup>1</sup> and are determined to ensure the design of emerging markets and accompanying supply chain pressures do not present both perverse incentives and the same rapid transfer of wealth and water from their region and others.

**If anything is to be made of these hard lessons, the coming revolution in investment and lending, changes in law, technology and food systems must be informed by land stewards not entirely by financiers and economists.**

At Gonn, in the southern NSW Riverina, landholders David and Sally McDonald, Stephen and Robyn Monk and Western Murray Land Improvement Group (WMLIG) set up a demonstration project, the River Country Biolink<sup>2</sup>, with the aim to make a start on designing an aggregated product for new markets to complement the growing of food and fibre while maximising the region's man-made and natural capital assets.

The biolink, a proposed wildlife corridor and carbon sink, would extend existing refugia from the Campbell's Island State Forest to the Ramsar-protected Murray Valley National Park - Noorong, across farmland.

The objective of the multi-disciplinary co-design team was to develop a ground-up approach that has the potential for creating multiple benefits for rural communities - not a top down demand benefiting distant shareholders.

The aim was to highlight the importance of farmers, ecologists and First Nations people - the real land stewards - informing when and how incentivising regeneration should work.

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<sup>1</sup> [Robber barons and high-speed traders dominate Australia's water market \(theconversation.com\)](#) and [Murray-Darling Basin water markets inquiry 2019-21 | ACCC](#)

<sup>2</sup> [River Country Biolink | Innovate to Regenerate - WWF Australia](#)

**All of the global ambitions for nature repair, carbon sequestration and sustainable agriculture rely on the water cycle.**

At the heart of the River Country Biolink co-design project was a focus on landscape rehydration to improve landscape functioning.

WMLIG centred landscape rehydration plans because the land stewards of this unique irrigation district inside a biodiverse inland delta hold many decades of intergenerational knowledge about how water works in the landscape.

We are water people and so are the Mulloon Institute. Their United Nation's endorsed program of landscape restoration is developed for increasing productivity and resilience. We see the multiple benefits of rehydration measures for increasing the integrity of new environmental market projects, as they complement farming.

Equally important in the design process was the critical evidence of cultural heritage as a proxy for exceptional environmental value in the region's riverine forests and wetlands.

The findings of bio-anthropologist Colin Pardoe and ecologist Dan Hutton have been invaluable in gaining an understanding of the links between highly productive biodiversity and traditional, Aboriginal residential patterns.

Evidence of large permanent settlements of Barapa Barapa people at the Pollack Swamp, a key reference site for the biolink design, and at other sites, indicates not only a rich biodiversity to support a large population but also that waterflow management took place up to 3000-years ago.<sup>3</sup> The Nacurrie Man, a 12,000 year-old skeleton, was found close to the biolink site in 1948.

Barapa Barapa and Wemba Wemba traditional knowledge via Ant Jones has been vital to informing the design of the biolink.

Chief among the objectives of nature repair markets, and the emerging methodologies that underpin them, will be both efficiency and efficacy.

The International Society of Ecological Restoration's (SER) Principles and Standards provide essential tools that can help ensure that time and resources invested in restoration projects are well spent.<sup>4</sup>

The co-design team used the SER's Recovery Wheel and eight principles to guide the biolink's conceptual plans.

An important companion to the SER's ecological restoration tools is their Social Benefits Wheel which assists in tracking the degree to which an ecological restoration project is attaining its social development targets and goals.

Crucial to avoiding the same mistakes and wide-ranging impacts of water market failure is the incorporation of socio-economic factors in determining success in nature repair and carbon transactions.

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<sup>3</sup> Pardoe, C. Hutton, D. (2020) Aboriginal heritage as ecological proxy in south-eastern Australia: a Barapa wetland village, *Australasian Journal of Environmental Management*.

<sup>4</sup> International principles and standards for the practice of ecological restoration. Second edition. *Restoration Ecology* S1-S46)

Among the biolink’s co-designers was Andrew Ward, co-founder of Regen Farmers Mutual (RFM), a farmer owned and designed environmental goods and services brokerage. The mutual was borne from a need for primary producers to create selling power and advocacy in market design and function by aggregating resources.

**Agricultural communities are fundamental for protecting natural heritage and meeting climate goals. A nature positive economy does not exist without them.**

Yet the overwhelming majority of Australia’s 150,00+ farms lack the resources to meet the challenge.

The mutual has developed pathways for farmers to make an environmental profit as well as an economic profit.

With access to fast moving market intelligence, which ranged from the quixotic to the pragmatic as market design and a number of regulatory frameworks are in development, the co-designers endeavoured to determine if a hydrated biolink could become a premium product. Equally, could a natural inland delta with internationally-protected biodiversity hotspots and a sophisticated irrigation system become known as a region for highly valuable carbon sinks, nature repair innovation and sustainable agriculture?

With climate change predicted to bring variables unseen in farming,(the northern hemisphere faced the hottest days in 125,000 years in July to August of this year)<sup>5</sup>, land stewards need demonstration sites, places to convene and forums to advocate in to ensure they have a say in how markets, regulation and government spending incentivises regeneration and climate solutions.

WMLIG thanks all of the participants for their insight, technical skills, generosity and encouragement in the development of the River Country Biolink’s conceptual design.

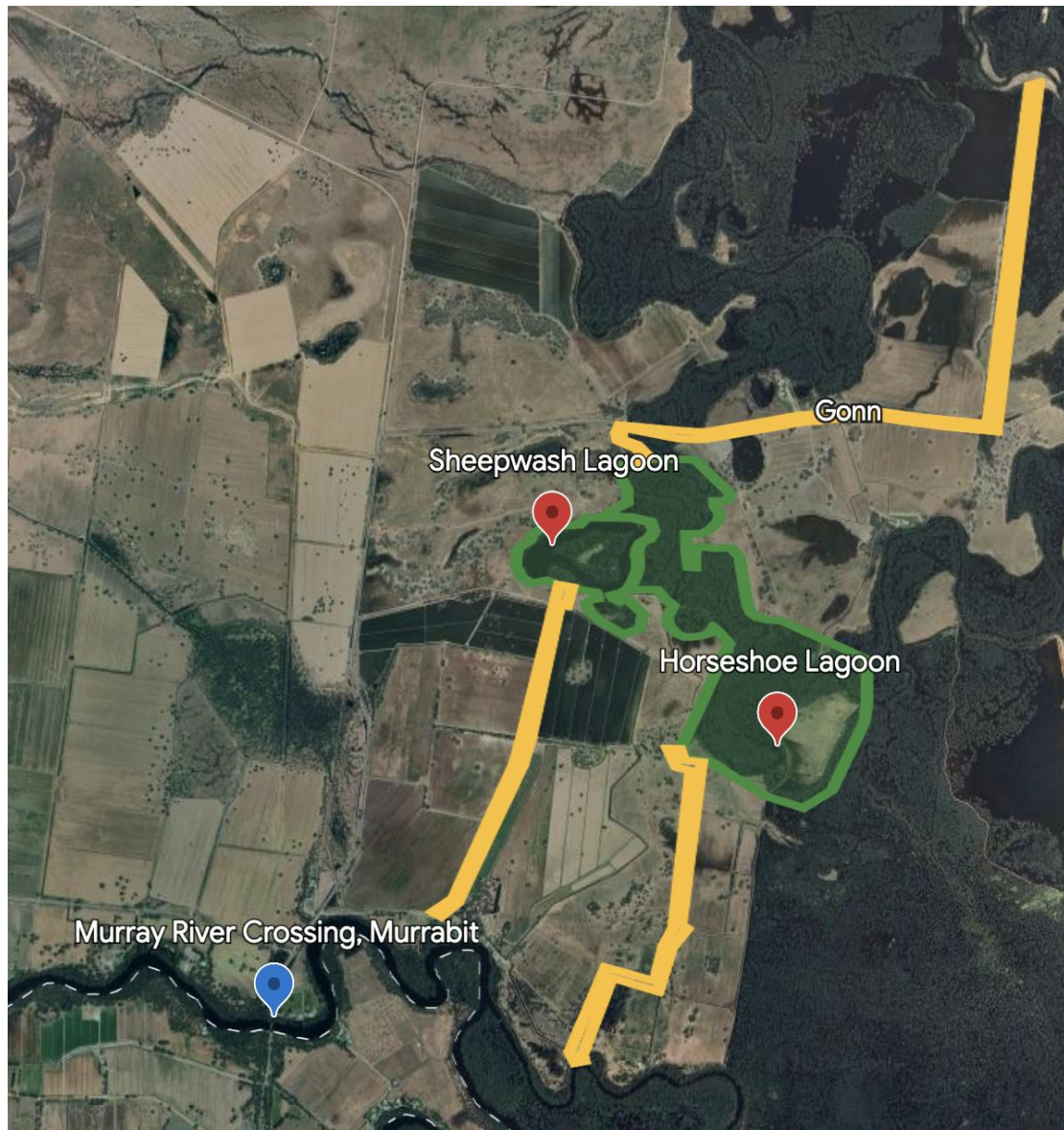
Jacqueline McArthur  
October, 2023



River Country Biolink co-designers convened on the bank of the Murray River at Gonn Station on July 13, 2023.

<sup>5</sup> [July 4 Was Earth’s Hottest Day In Over 100,000 Years—Breaking Record For 2nd Day In A Row \(forbes.com\)](https://www.forbes.com)

# Map



The proposed River Country Biolink: Up to 10km x average 30m of wildlife corridors extending from the Murray River towards the Wakool River. Landscape rehydration of Sheep Wash Lagoon and Horseshoe Lagoon are a focus of the project.

# Ecological Restoration

A case study: Understanding ecological and socio-ecological values, and their enhancement in an agricultural setting

By Maggie McDonald





## **Introduction**

The River Country Biolink project has presented a unique opportunity for a diverse mix of people to come together and work to create a solid foundation for an environmental market based project on private land on Barapa Barapa/Wemba Wemba country, southern NSW. Farmers, landholders, Traditional Owner's, family members, environmental and social scientists, community members and industry professionals have worked in collaboration to explore what a rehydrated biolink could look like in our environment. Understanding ecology and socio-ecology in an agricultural landscape on private property is crucial in informing the design of a rehydrated landscape.

This report goes into the detail of what ecological and socio-ecological values are currently present in the River Country environment, but also describes the guiding principles of potential remediation/intervention that could be implemented to restore health to a diverse site made up of freshwater wetlands, River Red Gum forest, Black Box and chenopod grasslands amid a productive agricultural landscape.

## **Background**

The River Country Biolink site is located in Southern NSW on the Victorian border near the small village of Murrabit. The area is in the country of the Barapa Barapa and Wemba Wemba Traditional Owners and holds evidence to suggest that the area was, and is, incredibly culturally significant. The project site runs adjacent to the Murray River in the South and the Wakool River in the North, providing the opportunity to link both a Ramsar listed wetland and State Forest in the South and a Regional Park at the North. The two private properties explored include the McDonald's "Gonn Station" and the Monk's "Moola".

Initial biolink design concepts involve the creation of a biodiverse, rehydrated biolink to provide habitat connectivity, and refugia, while also contributing to enhancing social values present in the landscape.

Therefore, the understanding of the cultural history of the land, current socio-ecological ecological values and of the site is mandatory in creating a biolink that is able to perform many roles in the landscape.

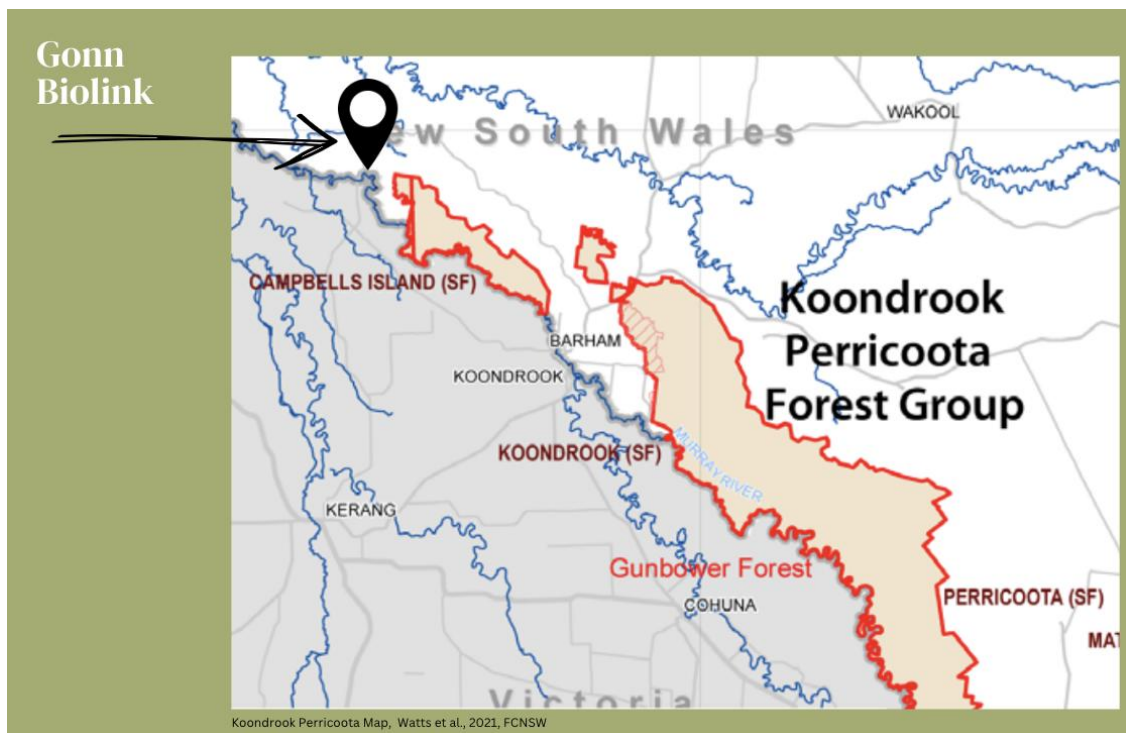


Figure 1. Gonn biolink location map, Watts et al. 2021

### Socio-Ecological Values

Understanding the socio-ecological context of an environment is the first step towards creating meaningful and long lasting change. To understand this it is useful to picture an integrated system or framework in which the environment/nature is placed among an interconnected system that relates to not only geomorphological attributes such as weather and the associated anthropological interactions as well.

Upon first glance, land management and/or land degradation may come to mind, however; when examined more closely the finer details of our relationship as humans, with the environment can be defined. Such relationships include the social and/or cultural values of place for societal economy, ceremonial or recreational purposes, as well as the secondary impacts of human life on the environment, such as the loss of biodiversity due to monoculture cropping practices. Such relationships are hard to define as relationships can be complex and multi-faceted, particularly per and post-colonial.

However difficult to understand it is crucial that these relationships are first acknowledged so that decisions can be made with an understanding as to what the flow on affects are in the broader context. This allows for symbiotic relationships to be formed wherein the environment as well as humans are beneficial. An example of that is the production gain in agricultural land that is managed in rotation and surrounded by biodiverse native plantings, the rotational cropping and/or grazing can fill the soil with missing nutrients which can lead to less fertiliser inputs and potentially higher yield.

This acknowledgement and understanding of the socio-ecological system that surrounds a landscape can be identified and documented in numerous ways. One example is the Core Benefits work by the Aboriginal Carbon Foundation (ACF).

Through the creation of a Core Benefits methodology, ACF has defined the importance of social and cultural considerations that can become benefits during an ecological project. It is in direct opposition to some carbon methodologies that use the term “co-benefits” that describe social outcomes as a side effect of ecological work, rather than crucial objectives of ecological work. The Core Benefits methodology is a working example of how integration of socio-ecological values into ecological projects can lead to a higher level of long-lasting ecological and socio-ecological benefits.

Core Benefits domains	
<p><b>SOCIAL</b></p> <ul style="list-style-type: none"> <li>• Increased social capital as community members work together on project</li> <li>• Increased confidence, self-esteem and sense of purpose</li> <li>• Increased pride in self and others</li> <li>• Increased community harmony through enhanced relationships and reduction of drug and alcohol abuse</li> <li>• Increased opportunities for women to participate and benefit from project outcomes</li> </ul>	<p><b>CULTURAL</b></p> <ul style="list-style-type: none"> <li>• Meaningful work that aligns with the interests and values of the Rangers</li> <li>• Protection of sacred sites (men’s and women’s business)</li> <li>• Maintenance and passing on of traditional ecological knowledge</li> <li>• Education of children by Elders in traditional knowledge, especially caring for country</li> <li>• Increased retention of language &amp; identity</li> </ul>
<p><b>ENVIRONMENTAL</b></p> <ul style="list-style-type: none"> <li>• Decreased carbon emissions</li> <li>• Decreased incidence and intensity of wildfires by burning country the right way</li> <li>• Protection of life and property through reduction of wildfires</li> <li>• Increased management of pests and weeds</li> <li>• Recovery of biodiversity through the protection of native species of flora and fauna</li> <li>• Increased management of tourists visiting country and reduction of their impacts</li> </ul>	<p><b>ECONOMIC</b></p> <ul style="list-style-type: none"> <li>• Secure employment for people living in remote communities</li> <li>• Employment of men and women</li> <li>• Career development opportunities</li> <li>• Good salary and working conditions</li> <li>• Supporting sustenance of outstations</li> <li>• Reduced welfare dependence</li> <li>• Strengthened community level economy</li> <li>• Development of income generation projects</li> </ul>
<p><b>HEALTH</b></p> <ul style="list-style-type: none"> <li>• Improved spiritual wellbeing through the regular completion of cultural obligations to country</li> <li>• Increased exercise and physical activity by working on the land</li> <li>• Increased nutrition through access to and availability of traditional foods</li> <li>• Increased nutrition through more regular sharing of traditional foods with family and others</li> <li>• Decrease in drug and alcohol consumption</li> </ul>	<p><b>POLITICAL/SELF DETERMINATION</b></p> <ul style="list-style-type: none"> <li>• Increased control over finances through economic independence</li> <li>• Increase in leadership skills</li> <li>• Increased confidence to work with Government, Private Sector &amp; NGOs</li> <li>• Transfer of knowledge through working in partnerships and combining traditional knowledge with latest technologies</li> <li>• Greater public awareness of the benefits from Land Rights</li> <li>• Achievement of Sustainable Development Goals at local and national levels</li> </ul>

Another example of how socio-cultural systems can be successfully integrated into ecological projects is the international Society of Ecological Restoration’s (SER) Social Benefit’s Wheel. The social benefits wheel, like the ecological restoration wheel, is an interactive tool that can be used to measure the baseline socio-cultural values of an environment, as well as to document change over time. Community wellbeing, knowledge enrichment, sustainable economies and stakeholder engagement are some of the social benefits explored by SER.

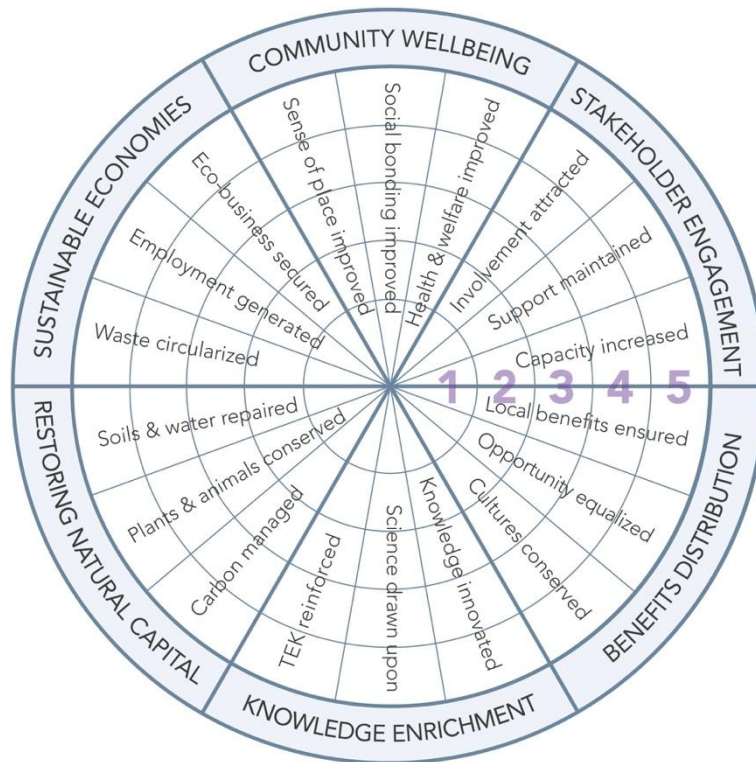


Figure 3. Social Benefits Wheel, SER

It is recommended that as part of the next phase of the River Country Biolink project a niche social-ecological analysis is undertaken of this environment, as well as the co-design of regionally specific social value tools/objectives. This process would provide the unique opportunity for Traditional Owners, farmers and scientists to come together and design what the “core benefits” are in our region.

**Ecological Values**

The following paragraphs will provide an overview of the present state/predicted state of the environment at the biolink site. Followed by an introduction outlining some tools/inspiration that can be used in the active remediation of the site, while ensuring social values and agricultural productivity are factored into the process.

**Current Ecological Value**

To date no in depth field surveys have been undertaken at Gonn or Moola due to weather and time constraints so the following is based on previous field visits and desk top surveys of the area.

As the properties envelope a large parcel of land in between two major river systems of Southern NSW the environment’s value is significantly diverse. Containing both ephemeral creeks and wetland sites the site encompasses River Red Gum, River Red Gum and Black Box, Black Box and Grey Box and open chenopod grass plant community types.

The extent in which these vegetation communities are intact varies greatly across the site due to the differing land use, management and water inundation fluctuations over recent history.

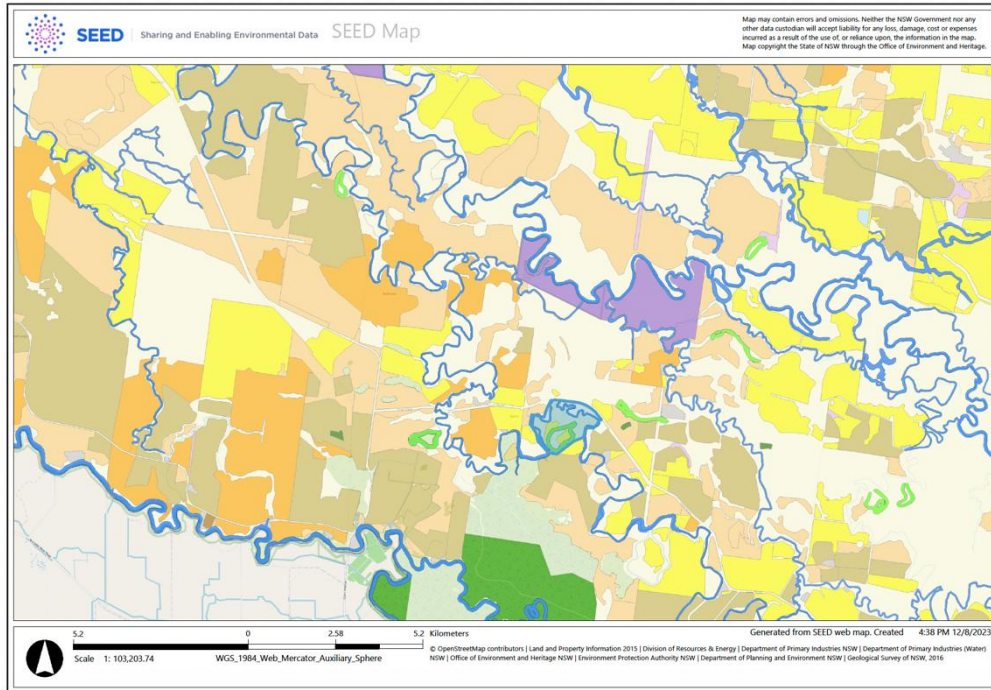


Figure 4. Land use mapping surrounding biolink location, NSW Seed Database, 2023

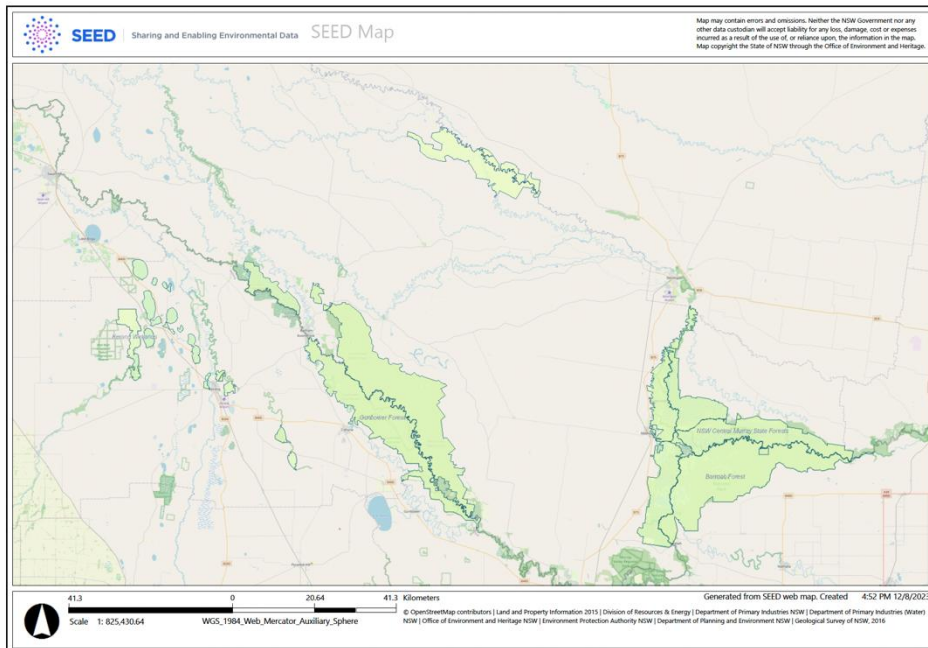


Figure 5. Ramsar wetland mapping surrounding biolink location, NSW Seed Database, 2023

It is recommended that more in depth and rigorous field flora and fauna surveys are undertaken prior to commencement of remediation works to aid in strategic adaptive management.

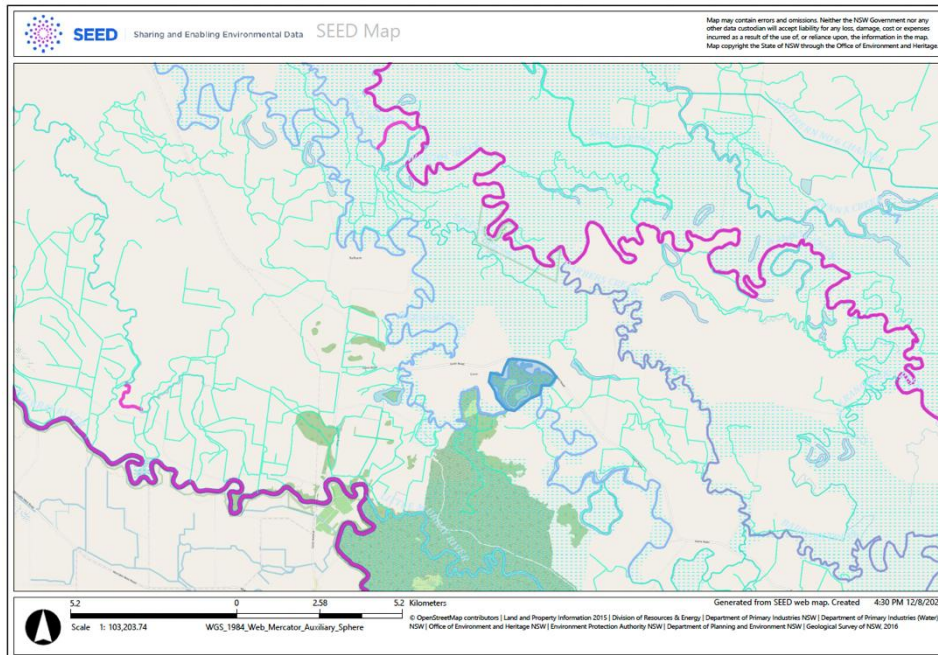


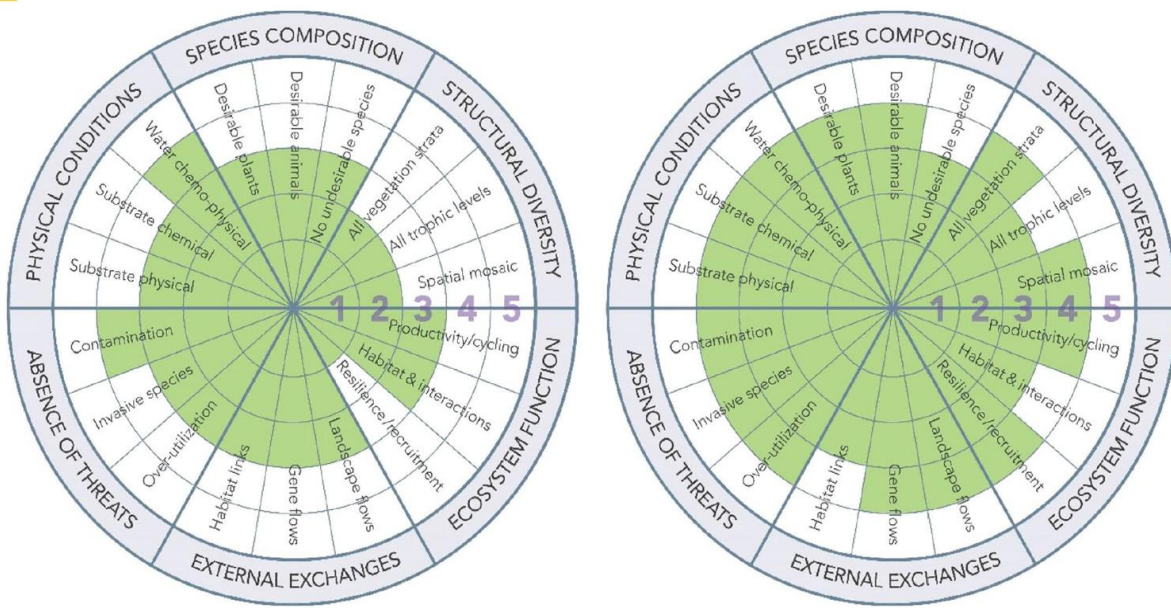
Figure 6. Hydrology mapping surrounding biolink location, NSW Seed Database, 2023

## Ecological Remediation

A River Country Biolink project objective to co-design the land management strategies and interventions used to ensure that the project is locally relevant, accessible for land owners/managers, and respectful of cultural use of land. The biolink provides a unique opportunity to expand remediation efforts already underway in the adjacent Ramsar listed wetlands. Below, necessary tools and principles imperative to successful ecological remediation are outlined.

## SERA Ecological Restoration Wheel

The Society of Ecological Restoration Australia (SERA) have published ecological restoration standards that were co-designed with the Australian landscape in mind. As such, it is a fantastic reference and jumping off point when it comes to beginning a rehabilitation project. Particularly useful is the SERA Ecological Restoration Wheel. The wheel is a great tool that displays the key pillars of ecological restoration and has been designed to be a useful tool for adaptive management, as it allows the tracking the progress and change over time in a landscape. It can also act as a tool to plan remediation activities/interventions as you follow the wheel around in a clockwise manner.



Baseline condition pre-restoration

10-years post-treatment

Figure 7. Ecological Restoration Wheel, SERA, 2016

A key SERA principle of restoration is that the environment restoration time, input and active intervention is guided by the extent of destruction of the environment. This is key to the restoration gradient (see below) which communicates the fact that depending on where an environment starts on the gradient, directly impacts on the remediation activity required to raise the ecological health of a site.

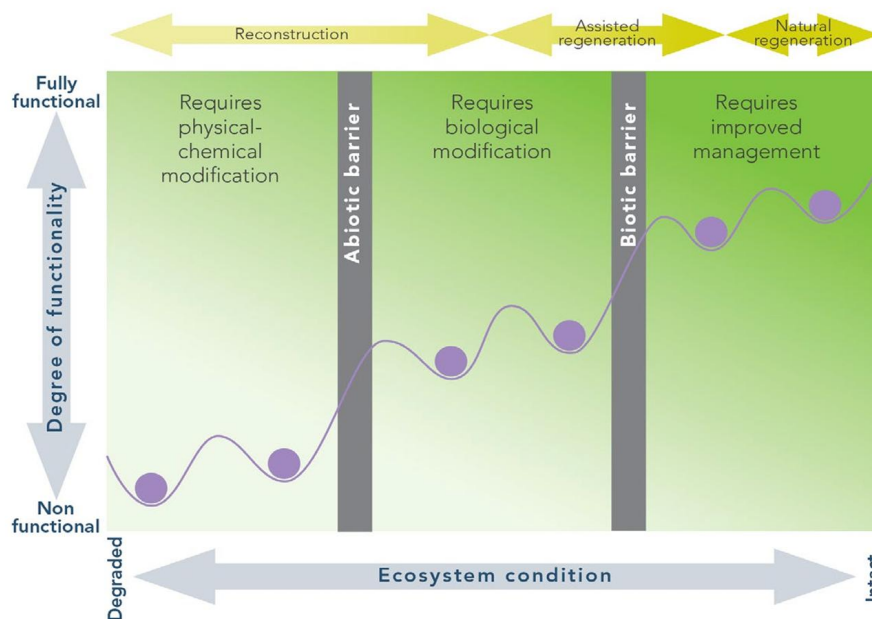


Figure 8. Ecological Recovery Gradient, SER

## Recommendations

The key to creating meaningful ecological remediation is tapping into the natural resilience of an ecosystem, triggering the reestablishment of the natural trophic cascade. This involves different phases of restoration/intervention activities depending on the baseline state of an environment and the desired restoration objectives.

We can also refer back to the restoration wheel and use it as a starting point to guide the chosen activities.

- The first phase, for example, may involve the control of invasive species of flora and fauna. This may include exclusion fencing, implementation of rotational grazing schemes and/or the spraying out of invasive plant species.
- The second phase, particularly for the biolink landscape, is the reintroduction of natural water flow and inundation to the landscape. Please refer to the Mulloon institutes report on landscape rehydration.
- A third phase of remediation work at the biolink may include the reintroduction of selected species, however; this is completely dependent upon the implementation of SAM by assessing what has naturally come back to the environment now that it has had its habitat features supported or reinstated. For example this may mean the planting of aquatic vegetation species or the planting of mid storey trees. It may even include the reintroduction of some fauna species, for example the locally extinct and culturally significant eel-tailed cat fish.
- The fourth phase of recovery in the biolink zone is zooming out to focus on regional or catchment scale recovery. As outlined in the Mulloon Institute's report, catchment scale rehydration is a possibility that can be explored further down the track.

These different phases of ecological recovery aid in the realisation of the ecological and socio-ecological objectives that have been identified in our co-design sessions to date.

### **Further recommendations include:**

- To continue the co-designing of both the framework for biolink design/implementation and a boutique environmental market product. True codesign allows for not only two-way knowledge sharing and enrichment, but also ensures that the end products are 'fit for purpose' and developed based upon a more complete set of background knowledge. This ensures the long-term sustainability of projects as stakeholders have been empowered to take ownership and 'steer the ship'.
- Cultural heritage should be used as a proxy for ecological and socio-ecological indicators for defining areas of importance/priority (Pardoe, C, Hutton D, 2020).
- Explore the potential opportunities of 'dual purpose' water. That is, water that is used for landscape rehydration and ecological enhancement, as well as increasing on farm productivity, directly feeding ecological and socio-ecological outcomes.
- Design River Country boutique environmental market 'products' that involve the acknowledgment of layers of value, input costs, incentivisation and the true rewarding of land stewardship, as it sits in the River Country landscape.
- Create a 'traffic light' system of levels of landholder engagement in projects. This ensures accessibility for a broader reach of landholders and allows for the unique balance between productivity/landscape restoration to be found on individual properties.
- Strategic adaptative management (SAM) should be built into all projects. This ensures the long-term success of any restoration project as informed management decisions can be made in real time.



- Ecological and socio-ecological monitoring and evaluation is undertaken through each phase of a biolink project. Cross cultural and socio-ecological monitoring are particularly important aspects in these types of projects.

## Conclusion

The first phase of the biolink co-design has been an enriching process by which all members of the team have shared knowledge with one another to become better equipped to design a biolink that not only meets environmental market requirements, but results in a truly enhanced landscape and community. It is clear, that through further collaboration an informed community can co-create and adaptively manage a biolink. A biolink that can support and uphold local flora and fauna communities, plant communities and enhance the well being of the local people.

## Murray-Darling Wetlands Working Group recommendations include:

- The ground survey and desktop work to develop estimated suitable volumes, and durations, frequencies, timing for delivery/movement of water, and proposed infrastructure requirements - are in our experience best supported and informed through 'trial' water delivery. It can sometimes be surprising as to how much water is required across a wetland or landscape to achieve a desired fill level (can be more or can be less). For example an 11 ha wetland on the Goulburn River Floodplain through extensive survey work on bathymetry etc estimated **24 ML** was the volume required to fill a wetland, however, our practical experience was that **60-70 ML** was required.
- There can also be variation from season to season, year to year (and sometimes, despite experience it can be hard to predict what the required altered volumes will be), with this in mind, having flexibility and the ability to adapt is important. An ability to access greater volumes if required, increasing the number of days to deliver water, or having 'top-up' events can help to achieve desired outcomes for fill levels and duration, and ultimately vegetation response, supporting waterbird or frog breeding etc. Similarly, the ability to cease delivery earlier than planned, having shorter durations can be another type of flexibility required to enable the project to be delivered appropriately.
- Delivery of water (particularly for an initial event) will need to be closely monitored by landholders and project partners so there is an ability to immediately respond if required.
- Given the scale of the project, a staged approach for the rehydration activities could be useful to enable practical assessment of water movement across the landscape in stages and the real need for infrastructure upgrades and/or new infrastructure can therefore be re-evaluated during and post each stage to ensure a continued effective approach.
- If revegetation of areas that are proposed to be rehydrated is a desired outcome, our experience is that an appropriate watering regime can in itself achieve 'revegetation' thus removing the need for planting activities to occur. Multiple years of a suitable watering/drying regime may be required, however, it is a cost effective way to achieve desired vegetation establishment and cover, and with plants of local provenance. Revegetation activities may be required if it is thought that the soil is devoid of a viable seed bank or plants no longer local to the area are wanted to be reintroduced.

- Field survey work to confirm elevations and profiles of key landscape features all assist in providing information for development of estimated volumes required, what heights will be reached, duration achieved etc. though applying water (i.e. delivery) will provide the best information to help guide what is required
- If areas proposed for rehydration are reidentified as requiring revegetation intervention (such as through planting), it would be worthwhile considering whether 'natural revegetation' is possible over time (from application of suitable hydrological regime and therefore the desired seed bank increasing within the soil, seed dispersal from water movement and wildlife, cumulative years of natural plant development and setting seed etc.
- Also worth noting, according to the River Murray Wetland Database (NSW Murray Wetlands Working Group 2005) cease to flow (CTF) levels for Sheep Wash Lagoon is 400 ML/d. It is listed as unknown for Horseshoe Lagoon.

## Supporting 'pollinator' highways and Superb Parrot flyways

Tahlia Stewart

*"If we lost insects, ecosystems would collapse. They're so heavily involved in nutrient recycling and pollinating, we can't live without them".*

*David Yeates, director of the Australian National Insect Collection, CSIRO.*

Insects are essential for the proper functioning of all ecosystems as food for other creatures, pollinators and recyclers of nutrients.

The world's insects are hurtling down the path to extinction, threatening a "catastrophic collapse of nature's ecosystems", according to the first global scientific review published in 2019. Four years later the warnings are more stark.

More than 40% of insect species are declining and a third are endangered.<sup>6</sup> The rate of extinction is eight times faster than that of mammals, birds and reptiles. The total mass of insects is falling by 2.5% a year, according to the best data available, suggesting they could vanish within a century.

Insects are the main food source for a range of species found in the Murray fans sub-bioregion, the site of the River Country Biolink, including microbats, insectivorous birds, and some reptiles (Reynolds and Hoffman, 2019). Bats are a keystone species, their presence indicates the health of an ecosystem and are a totemic species for Barapa Barapa people.

There is a strong correlation between pollinator decline and plant species decline in fragmented landscapes. As farming has moved from small scale production with different crops in small paddocks to large scale monocultural production, there has been a shift in the diversity of insect species. The full impacts of modern-day farming practices are realised at a later point in time as they begin to influence insect populations (Reynolds and Hoffman, 2019). New classes of insecticides introduced in the last 20 years, including neonicotinoids and fipronil, have been particularly damaging as they are used routinely and persist in the environment.

Measures can be taken to help boost insect populations, such as encouraging planting of a variety of flowering native species (Reynolds and Hoffmann, 2019).

Unravelling the natural histories and interactions that species have is crucial, as there are hidden co-factors to restoration that are important to consider when creating a plan. Pollinators require a number of resources, and they visit flowers for both pollination and non-pollination activities. Due to the intricacies in the relationships between insects and plants, and the current lack of knowledge in this space, measures should be taken now to improve and increase habitat and resources for pollinators in the ecosystem (Gross, 2017).

Practical restoration steps include planting a variety of species which flower at different stages, allowing for a staggered supply of pollen and nectar for breeding populations of pollinating insects. This will also benefit insectivorous and nectarivorous bird species in the region, as their food sources will increase in abundance (Gross, 2017). Biolinks can play an important role as contiguous corridor connecting existing refugia and enhancing opportunities for planting a variety of species.

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<sup>6</sup> [Worldwide decline of the entomofauna: A review of its drivers - ScienceDirect](#)

### **Biolinks as Superb Parrot Flyways<sup>7</sup>**

The Superb Parrot (*Polytelis swainsonii*) is listed as vulnerable in NSW and Australia.

Fewer than 5,000 – 10,000 birds remain in the wild.

In the Murray region, it nests between September and January in River Red Gum tree hollows along the Murray and Edward/Kooley Rivers. Over the nesting period, flocks of males feed together and travel to and from foraging sites where they collect food for the brooding females. Males may make 2-3 flights each day from nests to foraging areas and back, during which time the females do not leave the nest other than to be fed by the male.



Throughout the rest of the year, Superb Parrots forage in the surrounding grassy box woodland, White Cypress Pine woodland, Boree woodlands and grasslands of the Riverine Plains, away from the major rivers. Most of the foraging habitat is on private land.

Biolinks designed as Superb Parrot Flyways to improve connectivity between foraging and breeding habitats would include:

- Protected remnants containing hollow-bearing trees - fenced to exclude grazing stock;
- Known food plants for Superb Parrots, such as Gold-dust Wattle, Silver Wattle, Deane's Wattle, Wallaby Grass, Wedge-leaf Hopbush, Creeping Saltbush.

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<sup>7</sup> [Restoring Superb Parrot Flyways - Local Land Services \(nsw.gov.au\)](https://www.nsw.gov.au/land-services/restoring-superb-parrot-flyways)



## Offsetting and carbon markets

Recent changes in accounting and legislation encourage companies to find ways of reducing and offsetting their environmental impacts. Farmers are likely a key source of carbon and biodiversity credits for these companies to offset their impacts. RFM is creating a farmer-owned carbon pool to help farmers sell their excess credits into these markets.

## Insetting and supply chains

Consumer companies that rely on farmers for their produce are being required to report on their environmental impact. In turn, they are likely to pass these requirements onto farmers – leading to on-farm carbon and biodiversity outcomes being reflected in supply chains. RFM is working with members to ensure farmers are rewarded by their customers for their farming practices.

During the design period co-designers asked two questions about the marketability of carbon and biodiversity projects on Western Murray properties.

### **Question1: Could a hydrated biolink become a premium product in environmental markets?**

The biodiversity market in Australia is immature and so the carbon market, which is more mature, was investigated during the co-design period.

The carbon market does not have a suitable method for measuring and rewarding the hydrated biolink concept (yet). However, the carbon market can demonstrate that the biolink concept stands to be valuable through the price differences in carbon with and without co-benefits.

Carbon co-benefits such as biodiversity and cultural co-benefits have been valued and transacted within the carbon market.

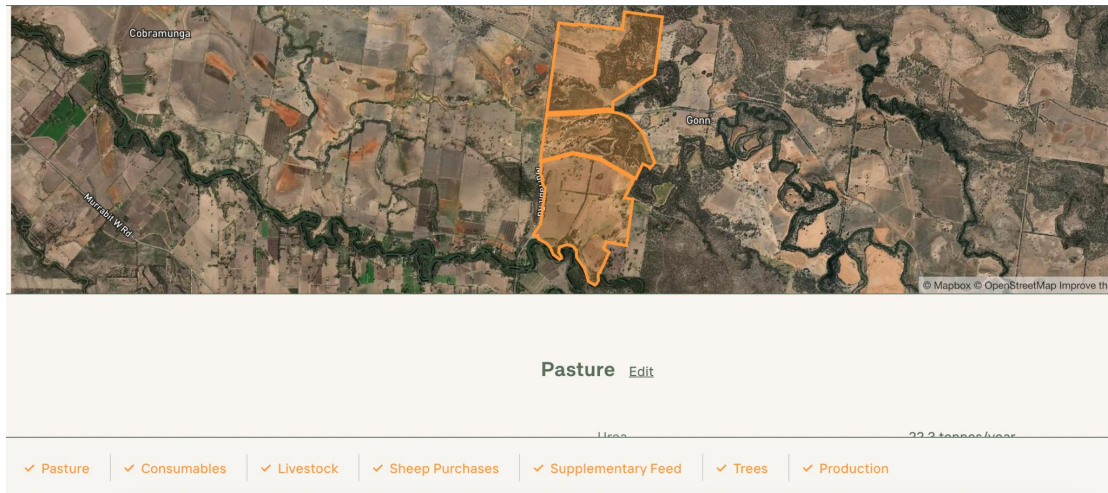
**Example 1.** The Queensland Government Land Restoration Fund has provided 3 rounds of funding for biodiversity and social co-benefits totalling more than \$12m dollars. This has seen farmers receive >\$90/ACCU when the forward price is ~\$30/ACCU.

**Example 2.** Tasman Environmental Markets works with traditional owners in Arnhem Land Fire Abatement (ALFA) enterprise and has secured them forward prices of \$57/ACCU for 25 years when the spot price is <\$30/ACCU. This price premium represents market demand for high quality, culturally relevant carbon supply.

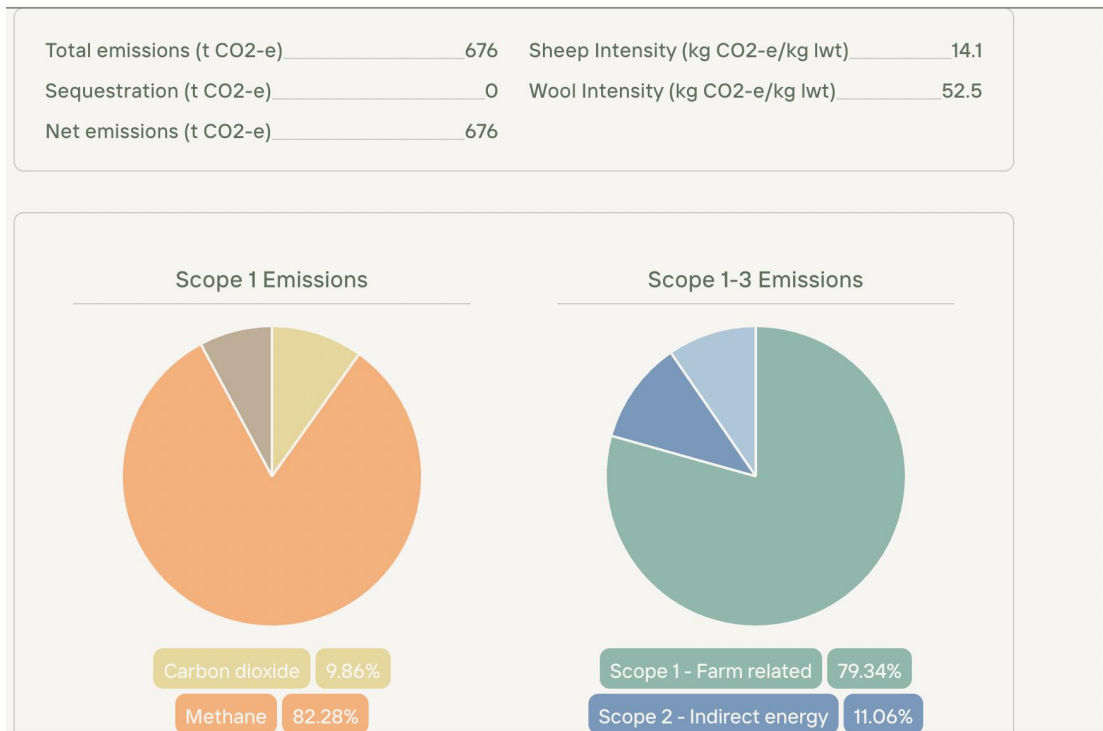
In addition to ACCUs being a source of income for farmers, farmers will need to produce carbon intensity measures for the commodities they produce and supply this information along with the commodity so that net prices can be established. Farmers who raise their carbon intensity will be penalised and those that reduce their carbon intensity will be rewarded. This penalty / reward structure is in place because buyers of commodities are required to report on their Scope 3 emissions from 2024 onwards. During this co-design we looked into the carbon intensity of David and Sally McDonald's farming enterprise and the opportunities for carbon sequestration at Gonn.

**Calculating Emissions:** Working with David McDonald, RFM mapped Gonn Station. This draws upon the location data, livestock emissions factors and inputs like fertiliser and fuel to come up with a net emissions for the business and emissions intensity for each commodity i.e. wool and lamb.

**Figure 1. Dashboard used to calculate carbon emissions.**

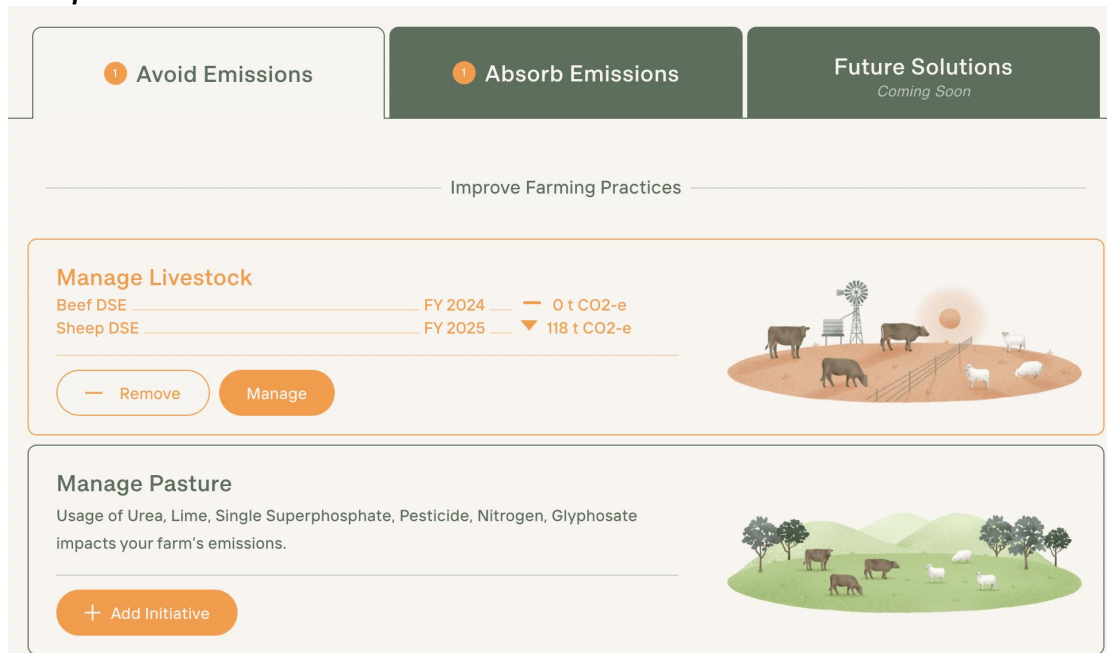


**Figure 2. Report identifying Net Emissions and Emissions Intensity.**



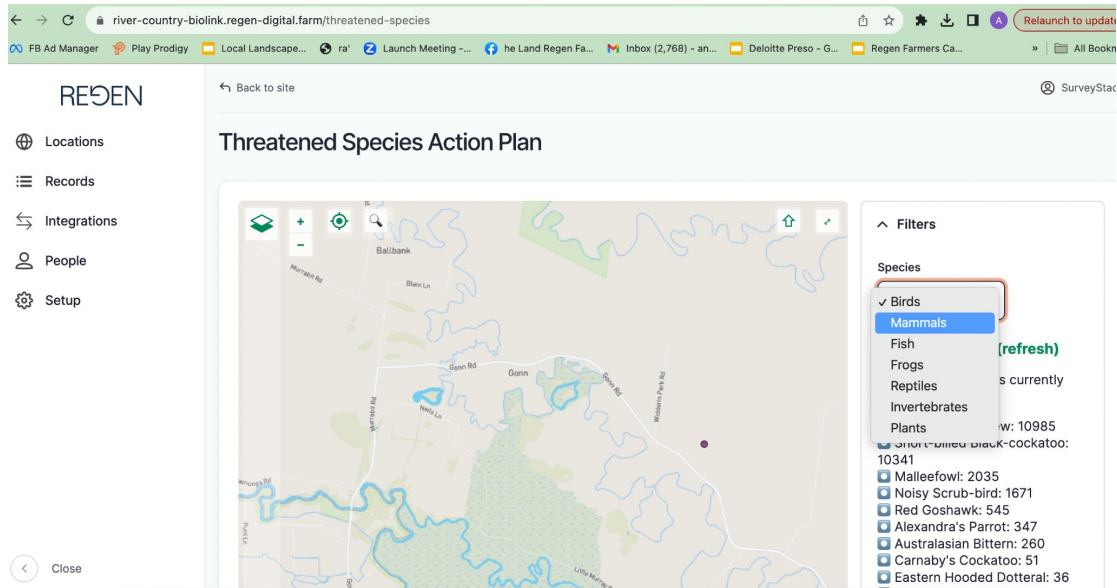
**Sequestration opportunities:** RFM and David established strategies that could reduce net emissions and emissions intensity over time. The emissions from livestock account for the majority of farm emissions.

**Figure 3. Sequestration Strategy Planning Tool identifying areas where the farming enterprise can avoid or absorb emissions**



**Biodiversity, Hydrology and Cultural Co-benefits:** Working with the farmers at Gonn and Moola a digital twin of the River Country Biolink was established by RFM. This represents - in data terms - the physical biolink. This data store contains the carbon information as well as other biodiversity information.

**Figure 4. River Country Biolink Digital Twin contains carbon and other environmental information in a farmer-owned data store.**





***Question 2: Could a natural inland delta with internationally-protected biodiversity hotspots and a sophisticated irrigation system become known as a highly valuable carbon sink and nature repair innovator while complementing sustainable agriculture?***

The River Country Biolink is an inherently valuable environmental asset because of the large number of birds, biodiversity and culturally significant sites. Protection and restoration of such habitat is important - hence the local RAMSAR recognised wetlands. However, the market mechanisms that reward protection and restoration remain immature.

An emergent driver for this type of asset are the international efforts around the Taskforce for Nature-Related Disclosures (TNFD) and the Science Based Targets for Nature (land use). These are designed to work together to incentivise the high level corporate actions needed to achieve nature goals in land systems – namely halting conversion and freeing up agricultural land for natural ecosystems.

The River Country Biolink would be compliant with the requirements, which are broadly 1) “in context intervention” 2) “multi-party cooperation” 3) “scientifically measured” and 4) “ongoing management” requirements. As this market matures Regen Farmers Mutual looks forward to supporting the local farmers in similar environments.

# Cultural Heritage: A proxy for environmental value

Colin Pardoe

*“The link between evolutionary models of human behaviour and social organisation is through ecology. Landscape is the stage upon which life's themes of energy and reproduction are played out. It is the unique combinations of ecology, evolution and society which produce historical sequences of change and variation.”<sup>8</sup> Colin Pardoe*



Hotspot productivity & sustainable management - from Blandowski or more accurately Krefft, 1864

## Archaeology in the River Country Biolink region

Archaeology has been a good guide to the environment. The villages and other sites being documented in and around the Ramsar-listed Koondrook-Perricoota State Forests are typical of a large stretch of Murray River floodplain, from somewhere upstream of Tocumwal on the Murray and Shepparton on the Goulburn Rivers; downstream to the Murrumbidgee Junction. It follows that conservation efforts designed here might be applicable over the same general region. The Biolink area sits adjacent to several major archaeological sites or regions.

## Coobool Creek

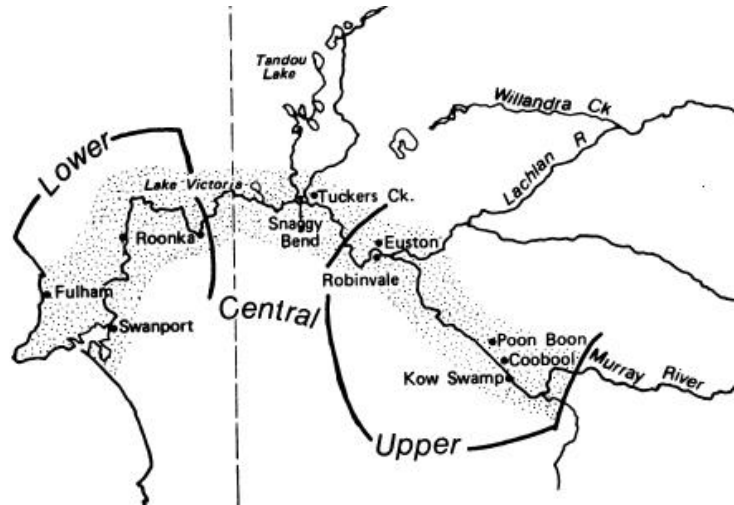
The ancient cemetery of Coobool Creek is one of the most important archaeological sites in Australia, yet most people have never heard of it. It is next door to the proposed bio-diversity region. The biology of these ancestors of Wemba and Barapa peoples gives us one of the best views of life at the end of the Ice Age [about 13,000 years ago] and the bodily changes that took place over the course of a few thousand years.

<sup>8</sup> Colin Pardoe(1994) **Bioscapes: the evolutionary landscape of Australia**, *Archaeol. Oceania* 29.

- Using archaeological evidence as environmental proxy.
- Intellectual property rights inherent in the archaeological record as a distillation of settlement decisions about the best places to live made over 3,500 years
- A simple supposition that larger numbers of people require more food. These places will be the environmental “hot-spots”.

Knowledge of this has disappeared from archaeological and public view over the years with the removal of skeletal remains from museums and from study. We never did know much about the archaeology of these people – where and how they lived. What is clear is that if there was a cemetery, there must have been a large residential place or places nearby.

Large cemeteries are seen along the Murray River. There are probably more, but we have not seen these yet.



### Campbell's Island

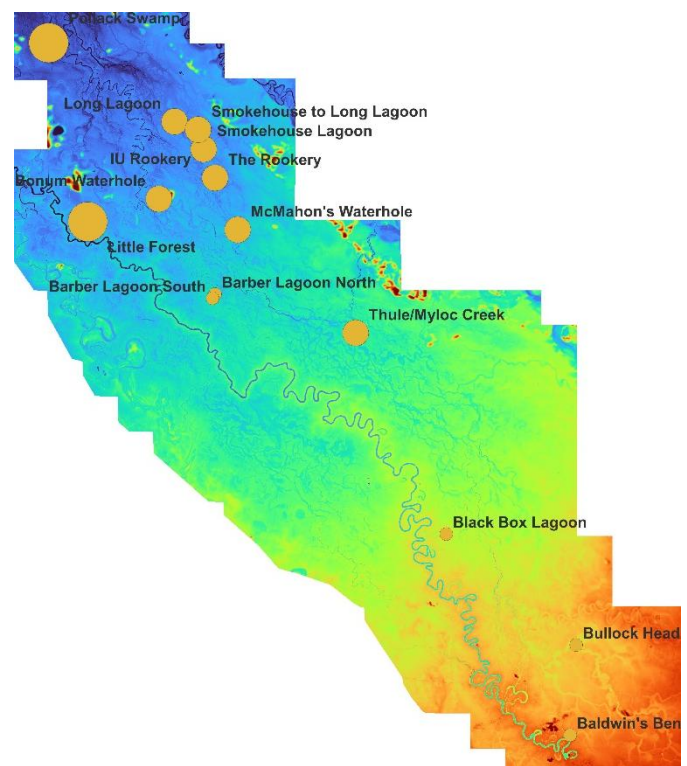


I have only visited Campbell's Island a couple of times. I always meant to return because there are a lot of earth mounds there [as there are upstream and across the Murray River in Guttrum and Benwell Forests]. The biggest draw was a large area that is to memory a cross between a low sand body and an earth mound. This site is very large and sits on the most westerly or downstream end of the Reserve.

### The villages of Koondrook Perricoota

Following efforts to map Pollack Swamp village [Pulitj], regeneration has been successful over the last 8 years. After the publication of the paper about using the archaeology as a proxy for environmental watering decisions, the team was funded to survey other locations in KP Forest. This is a map of those villages and hamlets [dots graded by number of mounds at each location].

This sort of residence patterning is almost certain to be found down as far as the Murrumbidgee Junction and upstream into the Millewa area.



The abstract from Dan Hutton and Colin Pardoe's article 'Aboriginal heritage as ecological proxy in south-eastern Australia: a Barapa wetland village', published in the *Australasian Journal of Environmental Management*, explains further the significance of cultural heritage in prioritising resources for regeneration.

"Aboriginal archaeology has a central role to play among the myriad government agencies and professional disciplines involved in land and water management of the Murray River Basin in south-eastern Australia. In this study, we examine managed water flows against the archaeological record which provides secure evidence of how people lived at the Murray River floodplain wetlands before European colonisation. Seasonal residential patterns and economic activities of large populations have been reconstructed using archaeological, environmental, and hydrological information. The result is a picture of people living in large groupings – villages and hamlets – around water bodies that we suggest are ecological 'hot spots' within the forest.

In identifying the preferred locations of village sites, we present the case for modification of environmental water delivery from large area forest flooding to targeted smaller water bodies that form ecological hot spots throughout the river floodplain landscape. Traditional Aboriginal land use in the form of the distribution of Aboriginal sites can act as an environmental proxy to inform heritage, land and water management policy and practices that seek to restore the health of the Murray River."

Dan Hutton, Ant Jones and David McDonald conducted a cultural heritage appraisal of the biolink zone at Gonn Station to help inform the project design and impart traditional and multi-generational farming knowledge of the landscape.

# Conclusion

**In what some are calling a ‘new gold rush’, Australian farmers may be asked to decide between providing food and fibre, carbon drawdown, nature repair and renewable energy.**

One key factor for farmers will be the potential returns per hectare.

As rural journalist Gabrielle Chan wrote, “When Australian farmers have become some of the [least trade protected in the world](#),<sup>9</sup> the dollar is a key determinant of survival in drought.

She asks: “Will one hectare of food give a greater economic return than one hectare of solar panels or one hectare of carbon farming or one hectare of native habitat or biodiversity in the predicted [“green Wall Street” markets](#)?”<sup>10</sup>

These are the decisions farmers will be weighing up.

The co-designers of the River Country hydrated biolink and carbon sink wanted to flip the focus on to something more intriguing.

What if the future we want actually attracts more types of returns, not just an individual financial one? And what if that individual financial return is greater because of that focus?

What if looking at our whole mid-river delta, and its many interconnections within the Murray-Darling Basin basin through this lens, and supporting joint projects like a series of well-designed hydrated biolinks and carbon sinks that are complementary to agriculture, help to tackle the main four losses associated with land degradation and removing water from the landscape, which are - loss of hope, loss of social networks, biodiversity and economic value - and, instead, aims to regenerate the landscape to create greater social, natural and financial returns?

The River Country Biolink co-design project, a work in progress, is an invitation to think deeply and take action on seeking sustainable ways to resource and be rewarded by whole-of-landscape regeneration as it complements sustainable food and fibre growing.

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<sup>9</sup> [5. Australia | Agricultural Policy Monitoring and Evaluation 2022 : Reforming Agricultural Policies for Climate Change Mitigation | OECD iLibrary \(oecd-ilibrary.org\)](#)

<sup>10</sup> [Labor’s plan for ‘green Wall Street’ in danger as Coalition backflips to oppose bill | Australian politics | The Guardian](#)

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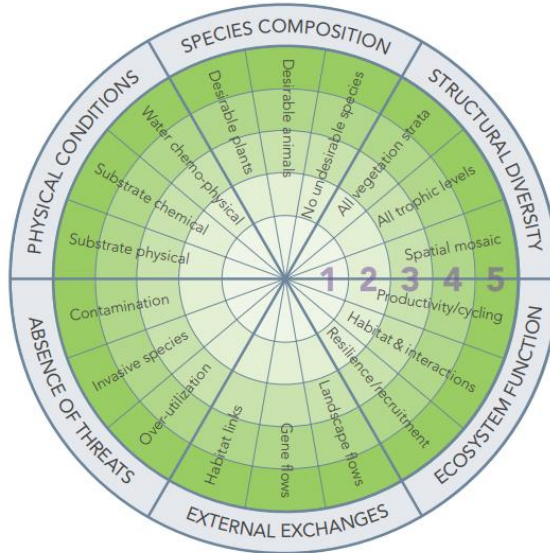
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# Appendix

## Appendix A: River Country Biolink Co-design notes



### RIVER COUNTRY BIOLINK - GONN STATION WORKSHOP CO-DESIGN NOTES &

### BARAPA BARAPA CO-DESIGN

13-Jul-23

ATTRIBUTE CATEGORY	SUGGESTIONS
Over-utilisation	
Invasive species (external)	Focus on integrated pest control measures, vertebrate pests, box thorn and bathurst burs, pest management concurrently with enviro programs
Contamination	
Substrate physical	
Substrate chemical	
Water chemo-physical	Rehydration- focus on what we can control/influence?
Desirable plants	Seed production, restoration of the low and mid-level story of native vegetation, protect totemic species



Desirable animals	Arboreal marsupials, more carpet pythons, bring back brolgas, reptiles, increase frog diversity and aim for 11 species (currently 8) 2005, fish (including crustacean) diversity, reinstate a healthy abundance of local totemic species back into the system eg Wadi Wadi totem from the Murray, the platypus. Reintroduce northern hairy nosed wombats to their former Riverina habitat, protect totemic species, design restoration to support reintroduction of small-medium sized mammals now locally extinct,
No undesirable species	
All strata present	
All trophic levels	multi-storey - trees, shrubs, ground cover
Spatial mosaic	
<b>ATTRIBUTE 5. Ecosystem function</b>	
Productivity, cycling etc	wetland water delivery to hydrate landscape and provide refugia during drought
Habitat interactions	
Resilience, recruitment etc	
<b>ATTRIBUTE 6. External exchanges</b>	
Landscape flows	Wetland watering regimes determined and implemented, hydrologic context/objective, wetland watering regime to compliment on farm management eg timing around irrigation
Gene flows	
Habitat links	

#### **SOCIO-ECOLOGICAL BENEFITS and 4 RETURNS & OTHER THOUGHTS**

- Climate resilience overlay throughout decision process
- Achieve community vision
- Revisit 'Murrakool' community wildlife surveys (Appendix C)
- Demonstrate knowledge enrichment in action (science, traditional and Indigenous knowledge)
- Possibly develop or monitor inline with accredited options eg, Accounting for Nature, ESG
- Engagement with local schools and wider community
- Demonstrate how ecological enhancement can be achieved in productive landscapes
- Employment more current methods that are easy to conduct -i.e e-DNA, COVRAM, Frog ID
- Recognition of and plan to conserve iconic/totem species
- Continue to engage with local experts and local champions

Establish a biolink that inspires an inland delta of biolinks extending from refugia and complementary to growing food/fibre/surviving drought financially

Use the biolink as a mechanism to obtain funding

Empower staff and landholders with information for entering environmental markets complying with ESG - don't rely on governments

CO2, biodiversity, ESG - what now?

Opportunity: look further into relationships with banks and how this can work to help farmers - i.e not just green loans but generally, loans

Multi-purpose water vs govt E-water - growing food helps biodiversity and carbon drawdown, both help with growing food - everything needs water. We need water!

Opportunity: Adding these biolinks to your property will increase the sustainability narrative for these farms

Opportunity: Undertake GHG audit and natural capital account on property to baseline prior to project commencement

Working on Country

Income diversification

Opportunity: could you sell private/voluntary market biodiversity certificates? Find a private buyer?

#### **Conversation notes: DH, MMc JMc**

Q: what does a River Country connected hydrated biolinks trophic cascade look like?

Start with heritage: occupation (residential patterning) is the proxy for environmental value, focus on water frequency, duration and extent of surface water and human occupation patterning in hotspots

drought proofing' human populations, where vertebrates choose to breed is reliable water in drought

look at lunettes, look for sand lens and big trees, are there soaks/swales, is the sandy spots where heritage found, therefore biodiversity?

each property is unique, there will be property specific totemic species ie southern bell frogs we know how to find the villages now, not the subtle difference between them; economic structure, food/medicine, tradable goods

Pollack didn't alter for 3000 years but sustained 450 people, Thule 300, Little Forest 350, distinguish the patterning - big ponds, wetlands, water manipulation, large productivity, design for surprise - we don't know everything, make the biolink the environment for surprises in regeneration

eg Channel country regenerates in surprising ways

#### **BARAPA BARAPA CO-DESIGN with Ant Jones**

DATE: 13/08/2023

Design for trophic cascade year by year - make for dragon flies> birds> seed distribution etc

Connectivity is Life

More life is more art - poetry, music, practise, painting, dance comes from connectivity/links bringing water and more diverse lifeforms/biodiversity

more biolinks across inland delta: good jobs for more people cross culture - design, plant/ rehydrate/ reintroduce, monitor, stewardship, market, sell

Food security - native food sources for diversity, native bees don't get varroa mite, nature jobs keep people in ag

Places to 'do' and 'be'

TOs handed back small land parcels ie travelling stock reserve - could join biolinks/ provide biodiverse seed stock

Travelling stock route seed banks could feed TO nurseries for biolinks projects

Native food production - contiguous biolink sites join old TSRs for local businesses to harvest native food/medicine

For viable biodiversity/nature repair projects invasive species management/ hunting is key

Co-design the biolinks for dragon flies, frogs, turtles, platypus

Small bodied fishes, yabbies, mussels bring bigger fish and turtles - little fish had/can have a big impact on a pumping food chain

Design for food plants - cabungi, reeds, water ribbon (little potatoes), salt bush (flavour to meat) design for big breeding events - Pollack had 360 pairs of great eastern egret successful breeding in 2022-23 (Hutton)

Werai - How could Werai have biolinks and types of connectivity?

Biolinks designed to attract Owlet Nightjar - Barapa womens' totem

Biolinks designed to attract Magpie - Barapa mens' totem

Food chain security big focus on insects and production benefits/interactions

Education: Linked places for people to gather and learn from each other and the environment, properties diverse

Good tucker: kangaroo or emu stew, galah stew, big fish

Micro bats eat insects so less predation on plants, megabats are pollinators so design for bats and bees

15 species recorded in Koondrook-Perricoota bat maps, of up to 23 species microbats - Barapa totemic species



**Sources:**

**Gonn Station Workshop:** David McDonald, Sally McDonald, Stephen Monk, Sarah Ning, Jack Smart, Andrew Ward, Tahlia Stewart, Maggie McDonald, Sascha Healy, Kathleen Bartlett, Jacqueline McArthur, Roger Knight

**Barham workshop:** Anthony Jones, Maggie McDonald, Jacqueline McArthur

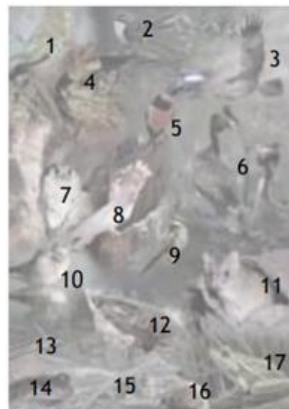
**Conversation:** Dan Hutton, Maggie McDonald, Jacqueline McArthur

**Diagram outline** as per McDonald T., Jonson J. and Dixon K.W. (eds) (2016) *National Standards for the Practice of Ecological Restoration in Australia*. Restoration Ecology

**Photos:** Barapa Barapa totems- Owlet Nightjar, Magpie and Chocolate wattled bat. Southern Bell Frogs is an endangered species found in Murray inland delta wetlands.

## Appendix B

Murrakool Wildlife Survey: Magnificent Diversity, Precarious Future - 2003-2004. Herring, M. W (2005)



### Murrakool's Unique Mix

1. Budgerigar - D. Webb
2. Chestnut-crowned Babbler - P. Merritt
3. Spotted Harrier - P. Merritt
4. Freetail Bat - C. Grabham
5. Red-capped Robin - D. Webb
6. Great Crested Grebe - P. Merritt
7. Australian Owlet Nightjar - P. Merritt
8. Major Mitchell's Cockatoo - P. Merritt
9. Rainbow Bee-eater - D. Webb
10. Sharp-tailed Sandpiper - D. Webb
11. Yellow-footed Antechinus - P. Merritt
12. Lace Monitor - D. Webb
13. Regal Skink - D. Webb
14. Spotted Marsh Frog - P. Merritt
15. Southern Spiny-tailed Gecko - D. Webb
16. Echidna - D. Webb
17. Southern Bell Frog - D. Webb

The Murrakool is the area between the Murray and Wakool Rivers where they run parallel to each other, from east of Barham westwards to their junction north of Tooleybuc and Goodnight, in the south western NSW Riverina.

In the most comprehensive survey ever recorded in the area, the region was found to support a minimum of **244** wildlife species during the period January 2003 - February 2004. (38 other species were expected but not found in the 44 sites during the survey)

**182 Birds, 27 Reptiles, 27 Mammals, 8 Frogs**

**12 species officially considered threatened in New South Wales were found during the study, including 11 birds and 1 frog.**

Including the **Australasian Bittern**. The booming call of the Australasian Bittern, the most threatened of the world's 12 bittern species, was acclaimed as **the call of the Bunyip** by some Aboriginal clans and early European settlers.

More than a quarter of the bird species found in the Murrakool, including **4 migratory shorebirds** species, are dependent on wetlands.

### **Biodiversity Hotspots**

#### **Wakool River and surrounds**

Regent Parrot, Feathertail Glider, Hooded Robin, Apostlebird, numerous Red-capped Robins, Diamond Firetail, three babbler species including significant 'edge-of-range' Chestnut-crowned Babbler population, three fairy-wren species, Yellow-footed Antechinus, Sugar Glider.

#### **Murray River region, specifically Campbell's Island and surrounds**

Gilbert's Whistler, Black-chinned Honeyeater, White-bellied Cuckooshrike, Azure Kingfisher, Sugar Glider, Yellow-footed Antechinus, Black Wallaby

### **Appendix C: Commonland's 4 Returns**



#### **Inspiration**

Giving people hope and a sense of purpose.



#### **Social Capital**

Bringing back jobs, business activity, education and security.



#### **Natural Capital**

Restoring biodiversity, soil, water quality and capturing carbon.



#### **Financial Capital**

Realising long-term sustainable profit.

### **Appendix D: Aerial and LIDAR images of the biolink zone**

# The Bridge

THE KOONDROOK AND BARHAM BRIDGE NEWSPAPER

No: 4332 Print Post: 10002834 **Thursday, September 14, 2023** Recommended Price \$2.00 Inc. GST Pages: 16

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**A CHAT WITH...**  
PAGE 7

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**FREE**  
inside today

Dan Hutton, Ant Jones, with Colin Pardoe via video link, presenting to the audience.

## River Country Bio Link

**Lloyd Polkinghorne**

51 people gathered at Western Murray Land Improvement Group's Bio Link field day to hear about the evolution in the way big business views farmland. The financial world loves a market and being 'green' is set to become the biggest market going. With carbon targets already set in the Paris Agreement, the next could come via the International Financial Reporting Standards (IFRS), which will also factor in biodiversity (nature).

Next year, there will be a legislated requirement for big business to report on their carbon emissions and the IFRS will demand business compliance to the standard or face higher borrowing rates.

"There's a golden rule, and if you're a Christian, it's do unto others what you'd have done to yourself, but if you're a capitalist, it's the person with the gold makes the rules," said Andrew Ward of Regen Farmers Mutual as he addressed the crowd at Murray Connect.

Regen Farmers Mutual helps its members first learn about opportunities with their environmental assets and then create new income streams or enhance existing food and fibre revenue.

"What they are all seeking to do with the frameworks, TCFD (Taskforce on Climate-related Financial Disclosure), TNFD (Taskforce on Nature-related Financial Disclosure), the science-based targets for nature, is trying to work out how to measure and value climate and environment.

"What that means is those costs were previously externalised and now they are going to be brought into organisations.

"Basically, they say 'we now need in order for you to do a financial report', you're familiar with a balance sheet and profit and loss, but to be IFRS compliant from next year, you also need to show your scope one, scope two and scope three emissions, so they are your direct costs."

While farmers at this stage are excluded in the legislated requirements, they, along with mining are the very beginning of the supply chain and so the large companies selling products will be required to drill down into the climate and nature-based origins of the goods.

"As farmers, we're in primary production. Apart from mining, we are the start of the economy. We are the inputs that then get manufactured into bread, food and fibre and all our clothes," said Mr Ward.

Banks also have an interest into the carbon and nature-based assets on farmers' lands, as the banks' emissions are sum of the emissions of their lenders. Likewise, the fast food industry emissions are the sum total of the farmers that supply them the ingredients that go into the burgers and the chips that they sell for everybody around the world.

With such a top-down approach looming on the horizon, the River Country Bio Link seeks to identify the unique opportunities with our productive inland river delta, and empower farmers to attract not just income but a large premium in the emerging environmental goods and services markets.

With farmers understanding their assets and opportunities, they can avoid being at the mercy of big business or banks using a computer model to make calculations on their operations.

Gonn farmers Stephen Monk and David McDonald have already been involved in a pilot project demonstrating how mid-Murray River delta communities could use landscape rehydration techniques to enhance biodiversity, cultural preservation and carbon drawdown.

The day saw a range of presentations centred around the opportunities for farmers and also the exciting work that has been done with a collaborative approach to natural resource management, such as Pollack Swamp.

Dan Hutton, ecologist and cultural heritage specialist, Colin Pardoe, bioanthropologist and archaeologist; and Ant Jones, cultural heritage consultant and expert in natural resource management, presented the rich cultural heritage of our area and explained how cultural heritage can be seen as a proxy for exceptional environmental value, outlining the bounty that the land once provided to its people and the sheer number of indigenous Australians it supported.

Ecologists Dr John Conallin and Maggie McDonald presented 'Nature Repair', which discussed ecological restoration and all the core benefits that this provided to our interconnected environment.

The Bio Mulleton Institute's Carolyn Hall and Jack Smart gave a glimpse of the work that they been doing on the institute's farms in NSW, but also across Australia in rehydrating landscapes. In what appears to be opposite to the Federal Government's push to remove water from our landscape, Carolyn and Matt explained environmental, social and economic benefits of rehydrating the landscape.

The morning finished with presentations from the Murray-Darling Wetlands Working Group's Sascha Healy on the philosophy and impact of over 30 years of wetland restoration, and Murray Local Land Services' Josh Campbell on applying NRM regional strategy to market projects and gearing up for environmental markets.

WMLG members can tap into grants of up to \$10,000 per landowner. Thanks to the NSW Primary Industry and Productivity Abatement Program (PIPAP) and the Regen Farmers Mutual, Western Murray farmers have the opportunity to leverage grants and advisory services to co-design aggregated projects and take them to an environmental market transaction.



Western Murray Land Improvement Group thanks its partners for their support of the River Country Biolink project.



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