SUSTAINABLE AGRICULTURE STRATEGY

LODDON PLAINS LANDCARE NETWORK

Prepared by Mal Brown | Scarlet Consulting 2020

ACKNOWLEDGEMENT OF COUNTRY

The Loddon Plains Landcare Network Inc. (LPLN) respectfully acknowledges that Indigenous Australians are intrinsically connected to the continent – including the area now known as Victoria. The Loddon Plains is Dja Dja Wurrung - Jaara People country and the Committee of Management pays their respects to Elders both past and present.

STRATEGY ACKNOWLEDGEMENTS

This strategy was written by Mal Brown through a process of consultation with LPLN representatives Michael Moore and Danny Pettingill and participants attending a focussed workshop in Serpentine during July 2019.

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Base map and data (page 5) from OpenStreetMap and OpenStreetMap Foundation

Cover photo by Jade Killoran

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www.greengraphics.com.au

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KEY TERMINOLOGY

Biodiversity

Biodiversity is the variety of life and its processes. It includes the variety of living organisms, the genetic differences between them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting. Biodiversity underpins ecosystems and the services they provide, upon which all people fundamentally depend. It supports recreational, cultural, spiritual and aesthetic values (Noss & Cooperrider, 1994).

Habitat connectivity

A section of the landscape managed primarily as habitat for native biodiversity, which is linked wherever possible to areas of native vegetation such as forests, woodlands, grasslands or other types of natural areas such as wetlands, waterways or rocky outcrops (Neerim and District Landcare Group, 2011).

Ecosystem Services

Ecosystem Services are the processes by which the environment produces resources that we often take for granted such as clean water, timber, and habitat for fisheries, and pollination of native and agricultural plants. Whether we find ourselves in the city or a rural area, the ecosystems in which humans live provide goods and services that are very familiar to us (Ecological Society of America).

Ecosystem Engineers

Ecosystem engineers directly affect the availability of resources to other species by changing the physical state of the environment. In Victorian woodlands, termites contribute to the development of tree hollows qualifying them as both ecosystem engineers and keystone species.
Managing for keystone species will help the survival of dependent species, although this will rarely be enough on its own. For example, although owls require hollows, managing for termites will not ensure owls are present.

Focal Species

This approach links a particular species with threatening processes, based on quantitative data. It requires extensive field sampling and involves identifying the threatening processes in a landscape, identifying the species most sensitive to each threat and managing each threat at a level that will protect the associated focal species. Threats can include patch isolation, patch size, habitat condition, and processes such as fire.

Keystone Species

Some species have functional impacts that bear much greater than their proportional abundance in the community. For example, the loss of top predators may lead to an increase in herbivores and loss of plant diversity and environmental degradation through overgrazing. Mistletoes are considered keystone species in Australian woodlands because they provide an array of resources for many other species (e.g. nectar, fruit, foliage, nest sites), and woodlands without mistletoes may have lower bird diversity.

Soil regeneration

Throughout history, humanity has constantly fought a war with the elements of wind and rain in trying to conserve the small amount of topsoil that is the living skin of the earth. In many countries like Australia we have largely lost that war and are also facing other related problems of land degradation in the form of salinity and tree decline. The challenge before us is to look beyond the problem and seek commercial ways to regenerate or to literally 'grow' increasing volumes of topsoil in order to achieve sustainable plant production.

The concept of soil regeneration involves the creation of new topsoil and to achieve this two main goals have to be achieved simultaneously: to increase both soil fertility and the granular structure of the soil. Soil regeneration is about building or making topsoil. For example, where one inch of topsoil is now on your farm the aim is to have twice as much in under three to five years.

In order to regenerate or rebuild your topsoil it is essential to have an understanding of the main natural principals that allow a soil to literally regenerate itself. Nature constantly uses these principles in order to build topsoil. For example, consider how nature rebuilds a biological worn out paddock with nature's own mineral gatherers which we call "weeds." The plants collect minerals from the subsoil and bring them to the surface in addition to their root systems aerating the soil.

It is also essential for you to interpret and assess your own soil's current state of regeneration, as by doing this you can identify its potential limitation with a view to determine what form of long and short-term cost-effective soil regenerative strategy can be taken. These soil regenerative strategies can be described as "triggering mechanisms" that change the soil environment and so enable the further progression and development of a greater quality and volume of topsoil within a given soil type. Triggering mechanisms may including soil aeration, appropriate fertiliser applications i.e. Lime if it is needed, and grazing.

Soil regeneration greatly relies on soil forming plant life and active beneficial soil organisms. Many soils are biologically dead and part of our aim is to create the right environment so the "life" in the soil can continue to recycle nutrients and thus increase the sustainability of the property. The end result of nutrient recycling is a farmer's most valuable asset - humus. The ongoing formation of humus in the form of Polysaccharides is the natural outcome of a biologically healthy and productive soil.

The LPLN Inc. will focus on exploring different management strategies in the form of triggering mechanisms that can be used to enhance a soil's own natural self-perpetuating regenerative process.

INTRODUCTION

Photo: James Nelsson

The Loddon Plains Landcare Network Inc. (LPLN) is an incorporated body established in 2009 that has grown to include 18 member groups and more than 300 land managers responsible for approximately 300,000 ha of private land. The LPLN area mirrors the Loddon Shire boundary, but also takes in parts of the City of Greater Bendigo, along with Gannawarra and Buloke Shires.

The Network values the financial support it receives from the Wettenhall Environmental Trust and all three levels of government. The LPLN collaborates with land managers and government agencies to enhance biodiversity on both private and public land to help ensure a future for a diverse range of native flora and fauna species.

The LPLN's vision is to achieve long-term sustainable landscape change through biolink projects and raising community awareness about the importance of biodiversity in an agricultural landscape. The LPLN recognises the importance of agricultural land across the Loddon Plains and its contribution to supporting the Network's farming families and adding value to Victoria's food and fibre supply chain.

The LPLN Committee of Management has developed this Sustainable Agriculture Strategy and Action Plan in response to the local agricultural community's desire to be more resilient, particularly in the face of climate change and other threatening processes. A consultation workshop involving local farmers and experts in sustainable farming systems has informed this Strategy.

The Strategy aims to proactively facilitate the transition to healthier soils across the Network's agricultural land as the foundation for achieving long-term sustainable landscape change, new economic opportunities and securing the future of the region and halting the exit of its farming families.

Implementing the Sustainable Agriculture Strategy will be a separate LPLN initiative, but it will complement the Network's other habitat connectivity and species conservation initiative, known as the GOANNA Project. The GOANNA Project is a landscape-scale restoration project across the Loddon Plains - home to diverse natural and cultural assets. The importance of this region as a primary food production area both locally and internationally is also recognised. The LPLN regards that a healthy environment is the foundation of healthy agriculture and a sustainable community.

The LPLN proposes that implementing the Sustainable Agriculture Strategy will involve a widespread community program that generates economic benefits, promotes environmental stewardship and social responsibility. In addition to keeping the current farming families in the area it will grow the community by supporting farmers and providing extension advice to facilitate the adoption of agriculture practices that underpin more sustainable and more efficient, productive enterprises that will create jobs.

The Strategy includes innovative solutions that are fit-for-purpose for our local landscape. These include, but are not limited to: land use change, practice change, farming native flora, regenerative forestry, carbon farming, and the opportunities provided by technology e.g. the Internet of Things and Industry 4.0.

Implementing the Strategy involves advocating for regenerative works in agricultural landscapes to restore ecosystem processes that underpin sustainable agriculture and natural ecosystems. Restoring native plant and animal populations and ecosystem processes in the agricultural landscapes of northern Victoria requires a concerted focus on private land. This is because while the public reserve system protects irreplaceable core areas, it is inadequate in extent and diversity to sustain all species or maintain broad-scale ecosystem processes. Many of the most ecologically productive parts of the landscape remain on private land.

Agriculture has made a significant contribution to Australia's prosperity. But such wealth has come at a cost. Farming practices and altered hydrological regimes have degraded the biophysical environment upon which agricultural production depends. Dryland salinity, increasing soil acidification and erosion, loss of soil biota, nutrient pollution of waterways and wetlands, and the spread of exotic animals and weeds are symptomatic of dysfunctional landscapes.

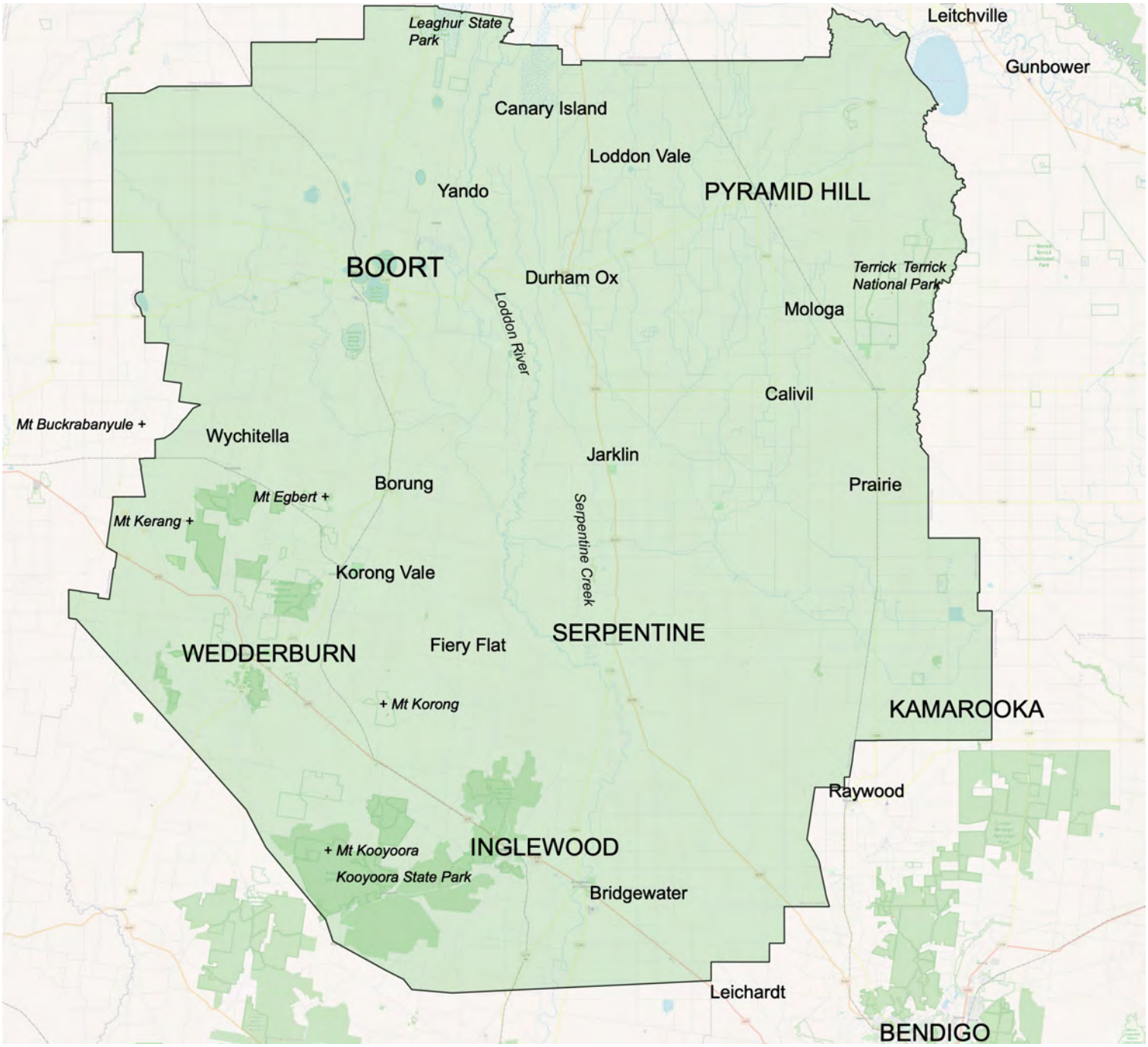
The LPLN proposes that implementing the Sustainable Agriculture Strategy will involve a widespread community program that generates economic benefits, promotes environmental stewardship and social responsibility. In addition to keeping the current farming families in the area it will grow the community by supporting farmers and providing extension advice to facilitate the adoption of agriculture practices that underpin more sustainable and more efficient, productive enterprises that will create jobs.

Changes in farming practices is just one of many actions that can improve ecosystem resilience. However, land managers seeking to undertake restoration works are confronted with an unfamiliar array of approaches, best described as 'guidelines' or 'rules' for restoration.

In addition to monitoring changes in the soil health of agricultural land (Carbon, Phosphorous, Nitrogen, microbial biodiversity, and invertebrate biodiversity), a species-based approach will be included for planning actions to restore degraded landscapes and as indicators for monitoring restoration success. In general, actions are designed based on the chosen species in the belief that this will result in wider benefits. This approach will better integrate the LPLN's goals for achieving a sustainable agricultural landscape with the biodiversity outcomes it is seeking.

LODDON PLAINS LANDCARE NETWORK AREA MAP

Photo: Malcolm Cousland



WHAT IS SUSTAINABLE AGRICULTURE?

Photo: Jade Killoran

Sustainable agriculture is farming in sustainable ways (meeting society's food and textile needs in the present without compromising the ability of future generations to meet their own needs) based on an understanding of ecosystem services, the study of relationships between organisms and their environment.

It is a long-term methodological structure that incorporates profit, environmental stewardship, fairness, health, business and familial aspects on a farm setting. It is defined by three integral aspects which are: economic profit, environmental stewardship and social responsibility.

Sustainability focuses on the business process and practice of a farm in general, rather than a specific agricultural product. The integrated economic, environmental, and social principles are incorporated into a "triple bottom line" (TBL); when the general impacts of the farm are assessed. Unlike a traditional approach where the profit-margin is the single major factor; Agriculture sustainability is also involved with the social and environmental factors.

THE LOCAL IMPERATIVE

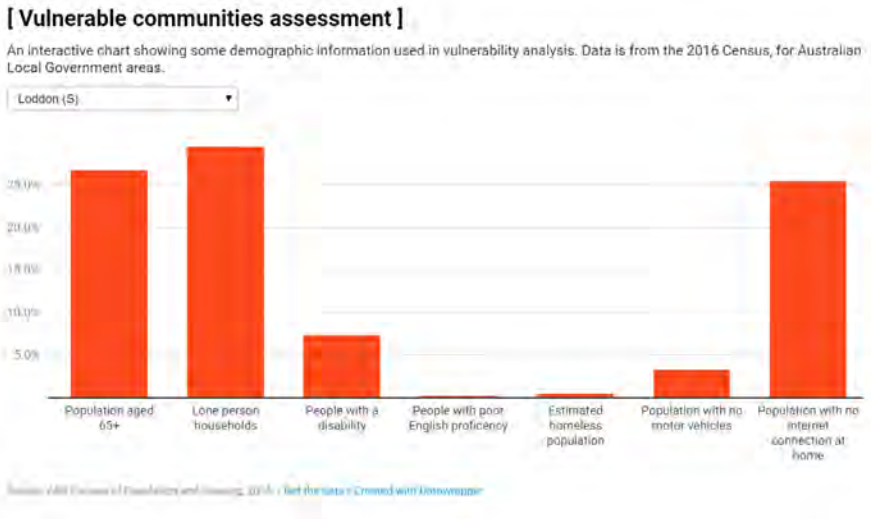
Transforming food and agriculture to achieve the United Nations Sustainable Development Goals

Photo: Jade Killoran

The Loddon Plains Landcare Network Area is home to a significant number of families suffering financial distress from climate change, low commodity prices, high energy and other input costs.

The Loddon Shire Estimated Resident Population for 2019 is 7,504, with a population density of 0.01 persons per hectare.

The national 'vulnerable communities assessment' arising from the 2016 Census identifies that communities in the Loddon Shire are among the most vulnerable in Australia. The 2016 Census revealed that 26.7% of the population is over 65 years of age, 29.5% of residents live in lone person households, 5% of residents have a disability, and 25.4% of residents had no internet connection at home.



The LPLN Sustainable Agriculture Strategy seeks to address these issues. By creating employment, providing food security, and implementing more sustainable farming practices that can increase the nutrient density of our agricultural produce, particularly for local consumption, we are confident that the 2026 Census 'vulnerable communities assessment' will be on the improve.

Photos (top right to bottom right):
Jade Killoran

This Sustainable Agriculture Strategy aligns with the Food and Agriculture Organization of the United Nations path to inclusive prosperity for all communities which is clearly marked by the 2030 Agenda for Sustainable Development. Overcoming the complex challenges that the world faces requires transformative action, embracing the principles of sustainability and tackling the root causes of poverty and hunger to leave no one behind.

As the prime connection between people and the planet, food and agriculture can help achieve multiple Sustainable Development Goals (SDGs).

Properly nourished, children can learn, people can lead healthy and productive lives and societies can prosper. By nurturing our land and adopting sustainable agriculture, present and future generations will be able to feed a growing population.

Agriculture and its associated industries (including aquaculture, fisheries and forestry), is the world's biggest employer, largest economic sector for many countries, while providing the main source of food and income for the extreme poor. Sustainable food and agriculture have great potential to revitalize the rural landscape, deliver inclusive growth to countries and drive positive change right across the 2030 Agenda.

The guidelines include 20 practical and interconnected actions with the aim of transforming food and agriculture and driving achievement across the Sustainable Development Goals (SDGs). They are:

1. Facilitate access to productive resources, finance and services
2. Connect smallholders to markets
3. Encourage diversification of production and income
4. Build producers' knowledge and develop their capacities
5. Enhance soil health and restore land
6. Protect water and manage scarcity
7. Mainstream biodiversity conservation and protect ecosystem functions
8. Reduce losses, encourage reuse and recycle, and promote sustainable consumption
9. Empower people and fight inequalities
10. Promote secure tenure rights
11. Use social protection tools to enhance productivity and income
12. Improve nutrition and promote balanced diets
13. Prevent and protect against shocks: enhance resilience
14. Prepare for and respond to shocks
15. Address and adapt to climate change
16. Strengthen ecosystem resilience
17. Enhance policy dialogue and coordination
18. Strengthen innovation systems
19. Adapt and improve investment and finance
20. Strengthen the enabling environment and reform the institutional framework.

WHY IS IT IMPORTANT IN THE LODDON PLAINS LANDCARE NETWORK AREA?

Photo: Jade Killoran

Sustainable agriculture across the Loddon Plains is important because it helps promote sustainable food systems and build community resilience. It keeps our farming families on the land which in turn support local businesses and maintain the vibrancy of the local community.

Photo: Jade Killoran

By being part of a growing network of farmers in pursuit of measurable and achievable sustainable farming practices that enhance biodiversity the area will become known as the source of quality produce that will help grow 'prosperity for all' across the Loddon Plains.

The extension advice, and in particular the property planning advice, that will flow by implementing the proposed program will be framed by the three cornerstones of economic, environmental, and social principles. This is fundamental to achieving the LPLN's goals for the program. For example, for many farming families on the Loddon Plains the issue of succession planning is currently front and centre as a generation of older farmers retire from farming. Extension advice is needed that is timely and that will help the younger farmers with informed decision making around the benefits / disbenefits of new methods and practices, farm layout, and machinery requirements for the future development of their farm.

Systems thinking is required and will be important in transitioning to a more dynamic decision-making framework for practices such as no till, cover cropping and holistic grazing strategies.

WHAT IS THE LPLN INC. DOING

to support the widespread pursuit of sustainable agriculture across the Loddon Plains?

Photo: James Nelsson

The Loddon Plains Landcare Network Inc. (LPLN Inc.) aspires to be an Australian leader in sustainable agriculture to complement its vision for enhancing the area's biodiversity. The LPLN Inc. has adopted the five key principles of the United Nations FAO to guide its work in this important area:

1. Increase productivity, employment and value addition in food systems
2. Protect and enhance natural resources
3. Improve livelihoods and foster inclusive economic growth
4. Enhance the resilience of people, communities and ecosystems
5. Adapt governance to new challenges.

To achieve its' goal the LPLN Inc. is seeking funding to employ a dedicated Sustainable Agriculture Project Officer to implement and drive this Strategy and to collect the data that will establish the evidence base for the transition to more sustainable, biologically diverse and profitable agricultural systems across the Loddon Plains.

We will:

- Develop an annual program of events and activities to promote sustainable agriculture to our farming community.
- Support our farmers to have confidence in taking the steps required to transition to more sustainable and profitable systems at flagship sites where we will collect and share the data that will establish the evidence base for accelerated change.
- Trial different systems - e.g silvo-pastoral systems – that have benefits for improved productivity, better animal welfare and healthier and more robust local ecosystems.
- Promote sustainable agriculture through publications, resources and reference tools and on the network's website. This would include access to monitoring station data such as soil moisture probes and climate change modelling outcomes, along with resources that are developed through the program, such as reports and podcasts as they arise.
- Collaborate with local educational institutions to promote sustainable agriculture in schools and tertiary institutions.

Photos (top right to bottom right): Jade Killoran, Danny Pettingill, credit unknown

- Build partnerships with other organisations and groups. These would include, but are not limited to:

  Vic No-Till (A senior committee member is a Network area resident)

  Victorian Farmers Federation (complementary support programs such as 'Look over the farm gate').

  North Central CMA (work with the soon to be appointed Manager, Sustainable Agriculture, Regenerative Agriculture Group, and other related initiatives).

  Agriculture Victoria (Smart Farms initiative, Soil Moisture Probe Network (Climate Kelpie), Artisanal Agriculture and the Victorian Food Innovation Network)

  Dja Dja Wurrung Aboriginal Corporation (grazing and native grasses, native foods e.g. wattle seed).

- Work with the relevant NRM agencies to optimise funding opportunities to increase the rate of adoption of sustainable agricultural practices across the Loddon Plains.
- Facilitate opportunities for organisations working in the sustainable agriculture space to work together.
- Support agricultural initiatives that have cross benefits for biodiversity. We will explore opportunities to work with agencies - DELWP in particular - to support properties that are also putting in corridors for shade and shelter, or fencing off the river frontage, etc.

THE BENEFITS OF IMPLEMENTING

the LPLN Sustainable Agriculture Strategy

Photo: James Nelsson

6.1 Education and community building

The increased adoption of sustainable agricultural practices will help the Loddon Plains farming community to better understand the benefits of diversity in agricultural systems and build stronger connections around the health of both agricultural soils and the natural environment.

6.2 Increasing environmental sustainability

Sustainable agricultural practices will contribute to the biological diversity of our agricultural lands and help to buffer the threatening processes of climate change and species loss.

6.3 Building the local economy

More sustainable food and fibre production across the Loddon Plains will have benefits to the local economy, keep our farming families on the land and strengthen the link between producers, providers and consumers and build employment opportunities.

As stated above, by being part of a growing network of farmers in pursuit of measurable and achievable sustainable farming practices we will become known as the source of quality food and fibre products that support biodiversity which in turn will help grow the prosperity of our community and strengthen the local economy for all families across the Loddon Plains.

We will support local farmers markets and promote the benefits of our food products, particularly the pursuit of producing high nutrient density foods.

NIL DESPERANDUM: A CASE STUDY IN REVEGETATION HISTORY

Nil Desperandum at Bears Lagoon -in the heart of the Loddon Plains Landcare network area -has been owned and managed by the Twigg family for 100 years. For the last 50 years, Bill and Gwen Twigg have conceived and trialled many innovative ideas to improve the landscape and increase productivity. Some worked, some didn't, some worked in unexpected ways, but Nil Desperandum is a living example of the evolution of ecological restoration for both biodiversity and production. With no sign of a farming heir, Bill concedes his focus is now continued environmental improvement with a commitment to biodiversity while maintaining the productivity and infrastructure of the farm.

Bill and Gwen Twigg inherited a stressed and treeless farm with declining productivity, and wanted to improve land condition sensing that productivity and profitability could be increased by farming in accordance with the land's capability.

Photo: Danny Pettingill

The Twigg's first challenge was to return perenniality to the landscape. Bill was a pioneer of lucerne-based pastures; around 80% of the 1325 ha farm is now lucerne-based pasture, mixed with other exotic pastures such as rye and sub clover, and a variety of other 'palatable weeds'. Native species (mostly Wallaby grasses Austrodanthonia spp.) comprise about 5% of the pasture. Bill contends this system, combined with relatively light stocking rates and rotational grazing, has proved successful, with consistently high primary productivity, reliable fodder in dry times, lower water tables, and improved ground cover and soil structure.

Bill is now interested in increasing the carrying capacity of his land by increasing the native component in his pastures, particularly Kangaroo Grass Themeda triandra, which is slowly returning, and saltbushes Atriplex spp., as lucerne production falls.

Paddock trees, patches of remnant vegetation and dead (standing) trees were (and still are) valued for shade, shelter and their contribution to biodiversity, which in turn helps control invertebrate pests. Remnant patches have been fenced to protect them from grazing. In their place, Bill has established 'forage' plots of acacias and saltbushes, which provide biodiversity and land condition gains, as well as an alternative fodder source. Many early strip plantings on Nil Desperandum were too narrow to produce the anticipated biodiversity benefits from increased connectivity. However, revegetated block plantings have incorporated remnant scattered trees, further increasing their habitat value. The blocks have probably played a key role in attracting and supporting several bird species (e.g. Superb Fairy-wren, Grey Shrike-thrush, Common Bronzewing) that have returned in recent decades.

A 'third generation' revegetation strategy has been to establish wide (~100 metres) biodiverse plantings along drainage lines, resulting in long, snaking swathes of vegetation through the property. These swathes not only provide habitat and movement pathways for fauna but also capture the most productive parts of the landscape enhancing ecosystem processes. As Bill continues to experiment, watch and learn, it is inevitable he will modify his methods and approach to improving the landscape – adaptive management in action.

Footnote: In July 2019 Bill and Gwen's 4,000 ewes produced over 6,000 lambs – a testimony to their landscape vision and the achieving of a productive landscape.

LODDON PLAINS LANDCARE NETWORK INC.

SUSTAINABLE AGRICULTURE 5 - YEAR STRATEGIC ACTION PLAN 2019-2024

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
1	Seek funding to employ a Sustainable Agriculture Project Officer to drive implementation of the LPLN Sustainable Agriculture Strategy.	LPLN Committee of Management and Wettenhall Environmental Trust.	Project Officer PD developed, funding sourced, and person appointed
2	Establish the LPLN Sustainable Agriculture Farmer Network.	LPLN members will be invited to sign up to a specific Sustainable Agriculture Farmer Network and to register their interest via login to the LPLN website. Members will receive quarterly newsletters, trial updates, access to soil moisture probe data, and invitations to field days etc.	No. of farmers participating in the program
3A	Deliver and manage flagship projects across the LPLN Sustainable Agriculture Farmer Network's cropping properties. Provide financial support to cropping farmers wanting to transition to more sustainable agriculture practices, establish governance arrangements and participation guidelines, monitor implementation and share data collected. Benchmark current local practices with sustainable/regenerative practices, including $/Ha and landscape function. Meet and engage with local experts for involvement and advice in trials and programs. Conduct an annual workshop for members of the LPLN Sustainable Agriculture Farmer Network.	Facilitate the adoption of the six principal steps to improving soil health for an array of cropping enterprises across the Loddon Plains: 1. Eliminate or minimise tillage 2. Keep soil covered 3. Maximise diversity and rotations 4. Minimise chemical and synthetic inputs 5. Stop compaction (Controlled Traffic Farming) 6. Include livestock in the system. (A difficult transition for existing 'cropping only' enterprises). It is recommended that the LPLN establish 4-8 flagship trial sites of 30 ha throughout the Loddon Plains area. Produce a step-by-step manual for land managers on the Loddon Plains to use on how to transition to more sustainable land management practices.	No. of farmers participating in the program. Participation in field days at each flagship site. Benchmarking data: $/Ha and landscape function. Practice change.
3B	Deliver and manage flagship projects across the LPLN Sustainable Agriculture Farmer Network's grazing properties. Provide financial support to livestock farmers wanting to transition to more sustainable agriculture practices, establish governance arrangements and participation guidelines, monitor implementation and share data collected. Benchmark current local practices with sustainable/regenerative practices, including $/live weight gain and landscape function.	Facilitate the adoption of the principal steps to improving soil health for an array of livestock enterprises across the Loddon Plains: Focus on systems approaches and holistic grazing management to preserve pastures and improve soil benefit. Develop watering point strategies to mitigate erosion and compaction. Encourage silvo-pasture and forestry planning for over-wintering of stock to maximise live weight gain, increase production and enhance biodiversity.	No. of farmers participating in the program. Participation in field days at each flagship site. Benchmarking data: $/live weight gain. Practice change.

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
4	Identify key sites, source funding and install a soil moisture probe and soil temperature probe network across the LPLN area, similar to the Lockington network available on-line at: http://lockingtonlc.weebly.com/	Source funding and work with software developers to improve the visual display of data, particularly annual rainfall. There is an IP opportunity to make this the best software for farmers accessing soil probe data. Work with dale Boyd, Agriculture Victoria.	No. of visits to website to access probe data.
5	Seek funding to undertake a project similar to the North East CMA's 'Embedding climate adaptation in Agriculture' (ECAiA) initiative in order to provide the best possible climate projections for the Loddon Plains Network area.	The North East CMA has initiated the Embedding climate adaptation in Agriculture (ECAiA) to increase the capacity of landholders, communities and local government to adapt to changes in regional climatic conditions. The first part of this four-year project has developed spatial tools to help guide discussions about climate adaptation pathways. The knowledge and tools developed through the ECAiA will assist councils to support the local agricultural economy. See https://www.necma.vic.gov.au/Solutions/Climate-Change/Embedding-Climate-Adaptation-in-Agriculture	No. of farmers accessing and using the data in their planning.
6	Compile a summary of the essential data from the North Central CMA Farming for Sustainable Soils and other groups to create a one-stop-shop as a resource for members and farming enterprises across the LPLN area.	This concept looks positive, but does it translate to practice change? For example, from the Lockington FSS group 2014 survey. • 52% of farmers were moderately satisfied, and 38% were highly satisfied with their participation in the project • Almost half of surveyed farmers have been highly motivated to undertake more trials and/or implement new approaches by the project, with a further one third moderately motivated. • 70% felt that their participation has helped them in achieving their sustainable soils management goals.	Changes to farmer understanding of soils and changes to soil management practices.
7	Engage with Dja Dja Wurrung Aboriginal Corporation to include a message of support for the LPLN Sustainable Agriculture Strategy.	The message suggested is that DDWAC is keen to work with the Loddon Plains Landcare Network in building and implementing a Sustainable Agriculture Strategy which supports health, wellbeing, connection to Country and the re-introduction of traditional food species.	Agreed Foreword to Sustainable Agriculture Strategy. Partnership projects.

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
8	Assist and support smaller farms in transition to sustainable agricultural practices with machinery access, loans or other arrangements.	Machinery is expensive and sometimes cost prohibitive for small operations. A cooperative arrangement should be discussed with flagship site participants.	No. of machinery loans or other machinery access arrangements.
9	Engage experts to assess costs, practices and methods to encourage farming enterprises into Sustainable Agriculture. Document evidence to prove or outline sustainable agriculture practice benefits for participants on economic, time and operational scales. Continue to build on previous work done by other groups and organisations.	This was a high priority for workshop participants. What is the cost of the transition from more conventional farming to sustainable practices and what is the ROI?	Detailed cost benefit analysis that helps support the business case for the transition.
10	Establish a mentoring model with key farming enterprises across the LPLN area. Ensure results (advantage and disadvantage) are well documented and publicised.	This would help fast track an individual's transition from more conventional farming to sustainable practices and provide the mentor with an additional source of off-farm income.	No. of mentor/ mentee relationships established and working well.
11	Continue to invest in native vegetation pasture trials.	LPLN Sustainable Agriculture Project Officer. Possible involvement of Dja Dja Wurrung.	No of trials. No. of farmers accessing the report.
12	Gather information from all groups and produce a public database for members. Translate skills and knowledge within the LPLN and greater community into a cohesive LPLN project	LPLN Sustainable Agriculture Project Officer.	Connect people across the area.
13	Seek expressions interest from LPLN land managers to participate in a Farming Flora / Regenerative Forestry exercise for: 1. Diversification/employment - native foods / flavours / essential oils / forest products / bioenergy / apiary 2. Resilience - climate regulation 3. Refugia for biodiversity.	LPLN Sustainable Agriculture Project Officer. Another opportunity to engage with Traditional Owners in producing native foods and other products	No of participating farmers and products produced and sold. Revenue received.
14	Establish an Advisory Group of interested farmers to drive the Strategy.	Whilst everyone is busy, there is value in having a dedicated group of respected farmers to oversee the implementation of the Strategy. It could be an LPLN CoM sub-committee, but better to draw on expertise from outside.	No. of expressions of interest to be on the Advisory Group.

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
15	Build community capacity across the Plains by supporting network members to attend key professional development opportunities focusing on sustainable agriculture.	LPLN Sustainable Agriculture Project Officer. Vic No-till annual conference August 2019 is a classic example of the opportunities to learn from experts in the field.	Requires funding but offers a big ROI.
16	The LPLN's role in ensuring food and fibre education initiatives are supported across the schools in the Network area.	LPLN Sustainable Agriculture Project Officer and existing LPLN farmers who visit schools voluntarily	Educate our next generation.
17	The LPLN's role in communicating the results of technology trials	The Department of Agriculture IoT trials offer big benefits to farmers on the Loddon Plains. Let's keep our farmers in the loop.	Improve access to farming technology in pursuit of sustainable agriculture.
18	Trial a silvo-pastoral system (shrub and grasses mix) for livestock.	• Farming flora for additional non-traditional income. • Growing the right species for in-demand products e.g. wattles for fruit, wood and seeds; Victorian sandalwood for essential oils. • Wattles fix nitrogen in the soil. • Quandong and wattle seed system developed for Orana. • Opportunities for multi, palatable species trials (silvopastoral systems). High value timber species can be grown in this landscape in a much shorter timeframe than previously believed.	An important trial to collect data and demonstrate profitable land use change options.
19	Establish and maintain an online library of priority podcasts that are of value to the LPLN Sustainable Agriculture Subscriber Network. Feature a different podcast each week to network members.	**"Regenerative agriculture is just booming. I think this is a train that you're not going to stop"** **Nicole Masters - Agroecologist and soil educator.** **Vic No-Till Facebook (multiple posts)** **How Investing In Regenerative Agriculture Can Help Stem Climate Change Profitably** **Regenerative Ranching in North Dakota** **Native birds create bigger yield for farmers** **Climate Crisis – Saving landscapes?** **Regenerating Land & Food Systems** **A conversation with Frances Jones from the remote Wooleen Station**	

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
		Grassroots Revolution: Radical experiments regenerating land & life - Charles Massey (Call of the Reed Warbler) David Pollock and Francis Jones (Wooleen Station) **An Underground Insurgency: Regenerative Agriculture & Human Agriculture & Humans** **Cultivating Regeneration from Industrial Wastelands, with Charles Massy** **Three geckos and three thousand cows** **Peter Andrews, Verity Morgan Schmidt, Alan Broughton**	
20	Establish a LPLN Regenerative Agriculture Landcare Group in the area. The group would move around the Network area holding a minimum of 6 meetings per year.	This group would work as a conduit to disseminate information, provide guest speakers, provide a place for open learning and conversation regarding new methods and allow for an informal setting to encourage take up and celebrate success stories. We recognise that the North Central Landcare Group is operating but we see the need for a broader group across the Network area.	LPLN Sustainable Ag officer, LPLN Landcare Facilitator
21	Provide local and regional information on a pasture species mix for annual coverage and stock feed succession.	The aim is to provide detailed cover cropping species mixes for seasonal sowing to maximise successful sowing and survival of cover crops and pasture covers on an annual basis that are specific to the Loddon Plains	LPLN Sustainable Ag officer
22	Include a Carbon sequestration target. e.g. increase carbon in cropping soils to 2% with an aim to get to 3% within 5 years. Include a pasture and revegetation cover target for grazing lands and increase perennial vegetation (forestry) to say 20% of the Network area. Publish progress measurements.	'Soil organic carbon' (SOC) – the amount of carbon stored in the soil is a component of soil organic matter. It releases nutrients for plant growth, promotes the structure, biological and physical health of soil, and is a buffer against harmful substances. SOC is part of the natural carbon cycle, and the world's soils holds around twice the amount of carbon that is found in the atmosphere and in vegetation. Organic material is manufactured by plants using carbon dioxide from the air and water. Plants (and animals, as part of the food chain), die and return to the soil where they are decomposed and recycled. Minerals are released into the soil and carbon dioxide is released into the atmosphere. SOC accounts for less than 5% on average of the mass of upper soil layers, and diminishes with depth.	

	Actions	Lead Responsibility and/or comments	Measurable Outcomes
		According to the CSIRO, in rain-forests or good soils, soil organic carbon can be greater than 10%, while in poorer or heavily exploited soils, levels are likely to be less than 1%.	LPLN Sustainable Ag officer
23	Preserve and develop soils as a super organism. Advocate for the importance of healthy soil to farming enterprises with less reliance on chemicals and artificial fertilisers and more emphasis on building biodiversity and biomass (including carbon) for healthier soils and more nutrient dense food products.	Nutrient density of foods has declined in recent years. The LPLN is keen to measure whether more sustainable agriculture practices can increase nutrient density.	LPLN Sustainable Ag officer

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