Ballance Farm Environment awards

2023 National Ambassadors for Sustainable and Profitable Farming and Growing “Study and Flag-Flying Tour” report

Our whirlwind tour of Tasmania

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Contents

Acknowledgements

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- Yolanda Hanusch from NRM South Tasmania
- Tim Ackroyd from NRM South, Tasmania
- Chris and Clair Headlam from Ratharney, Southern Midland's area, Tasmania
- Rae and Lindsay Young from Lewisham, Northern Midland's area, Tasmania.
- Tim and Sarah Clark from "Back Run", Derwent Valley, Tasmania
- Peter Ball from the Derwent Catchment Project
- Karen Phillips from the "The Derwent Catchment Group" plant nursery
- Collette Glazik who is a consultant and Australian 2022 Nuffield Scholar from Hobart
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Introduction

We are delighted to be the 2023 recipients of the Gordon Stephenson National Ambassadors for Sustainable and Profitable Farming and Growing.

In addition to our ambassadorial duties, and with the assistance of the Ministry of Primary Industries (MPI) we were provided with the opportunity to participate in a directed study and ambassadorial overseas tour called "Study and Flag-Flying Tour".

The objective of our tour was to develop our understanding of natural grasslands ecosystems and how they complement our current pastoral grazing systems. We were interested in understanding the value proposition of improving our own environmental credentials and selling these outcomes to provide new revenue streams.

To understand the purpose of our study tour we will give you a brief overview of our farming business, and how we determine progress.

We operate a 1470ha dryland property, located in Otago called Auldamor Ltd. The farm is currently used for sheep breeding, finishing and cattle grazing. We have recently diversified into timber and carbon trading (both exotic and regenerating native) through the nationally recognised New Zealand Emission Trading Scheme (NZETS).

The farm is situated within the Taiari Wai catchment. The catchment is known for its rocky landscapes, significant waterways and wetland areas as well as its richly diverse dryland tussock ecosystems. The area has been identified as a biodiversity hotspot.

Approximately 35% of our farm is undeveloped, mainly in snow tussock and/or upland grey shrub. This is found predominately in our gully systems where most of our Critical Source Areas (CSAs) and waterways are located. The natural or semi-modified tussock grasslands complement our current farming system as they provide light grazing for stock, shelter and to some extent riparian management for our developed grasslands due to the natural topography.

Progress and our decision making on farm is underpinned by our core values and filtered through our three key parameters: financial resilience, environmental performance and our social impact. This has been a shift away from purely production focused to farming more in tune with our natural capital. We are an intergenerational farming family which give us purpose and connection to an area and a community. It gives our family grounding and balance as well as autonomy and flexibility in our lives. We get a lot of enjoyment and fulfillment in producing quality food and fibre products and it is satisfying to see the tangible progress we have made on farm over recent years.

To strengthen our financial resilience, we are looking to diversify on farm with consideration to the lands capability and to create enduring and nature positive outcomes. Our limited pool of natural resources and challenging climate mean we have significant land use limitations, with pastoral grazing, occasional cropping and some forestry as our best option. Approximately 80% of the Taieri catchment that is not in conservation estate is used for sheep and beef farming. Our recent integration of primarily exotic forestry into our marginal country was the result of economic drivers, family succession considerations as well as regulatory pressures. However, we understand the change in land use may lead to unintended consequences such as: loss of biodiversity, change in water flows, increase fire risk and the intrusion of weed and pests all of which may be exacerbated by climate change.

Our current economic models reward farmers for the food and fibre we sell but not necessarily the essential role they play in mitigating climate change and increasing biodiversity. The tussock grasslands are rich in biodiversity and have been a key component of New Zealand's prosperity through livestock

farming and tourism. Livestock farming is transitioning from an economic model which prioritises commodity products to one that prioritises, measures and validates natural capital on farm.
The change in focus creates a new role for farmers which can be capitalised on through a number if mechanisms such as new emerging markets designed to bridge the gap between farmers trying to create positive environmental change and investors looking to fund these pursuits.
Our tussock grasslands are rich in biodiversity and are a key component of our national identity, but in some cases lack the appropriate incentives, especially with private landowners to conserve and reward our farmers for their stewardship.

Study and Flag-Flying Tour- Project outline.

We ventured to Tasmania, Australia for our Study and Flying the Flag tour. The tour was focused within the Midlands and Derwent Valley regions.
The regions generally experience a temperate climate with low to moderate rainfall, similar to our own catchment. The Midlands is known for its temperate natural grasslands, one of the most threatened ecosystems in the world.
The economy is driven by sectors reliant on natural resources, including agriculture, fisheries, aquaculture, forestry, tourism, and energy production. The Midlands area has a diverse agricultural sector, due to the productive soils and a number of microclimates. The most valuable agricultural commodities (based on gross value of production) are wool, cherries, and sheep sales.
Tasmania is known for its rich biodiversity of which 80% of the plant species are endemic and unique to the island. Southern Tasmania is recognised globally for its healthy, intact and diverse natural landscapes. The wealth of natural resources contribute significantly to the region's identity and economic, social, and environmental wellbeing.
There are numerous conservation initiatives in progress to support landowners with sustainable management practices and conservation efforts. Currently 37% of all farms in Tasmania have conservation areas.
We created a 3-day itinerary with the assistance of MPI and the Southern Tasmanian Natural Resource Management (NRM) Association known as NRM South. The role of NRM organisations is to protect, sustainably manage and improve natural resources for the shared environmental, cultural, social and economic benefit of the community.
The first two days involved visiting farming operations within the Midlands and Derwent regions and on day 3 we were able to catch up with Colette Glazik who is currently undertaking a Nuffield scholarship in farm scale carbon accounting methodology.
Following on from the visits we connected with several people post tour to strengthen our understanding and knowledge on several different aspects including the natural resource models currently being piloted in Australia.

Project itinerary and observations

Visit number: 1.

Date: 18th Jan 2024

Area: Southern Midlands near the Tamar River

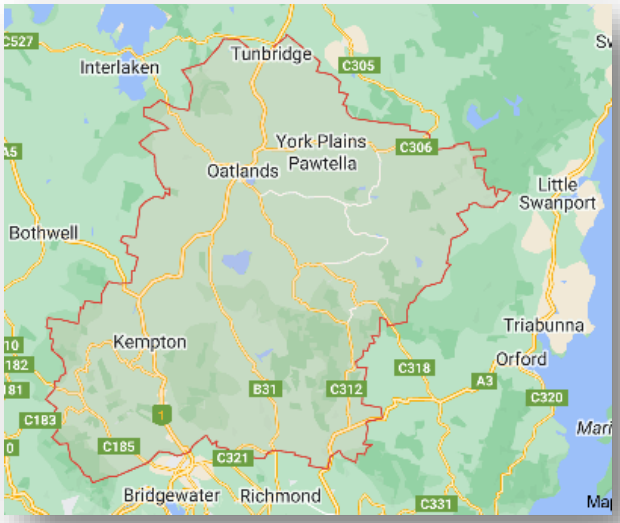
Landowners: Chris and Clair Headlam

Farm name: Ratharney

Total area: 1800ha

Farm overview: Approx 8000 sheep, mix of crossbreed and Merino ewes for fine wool and lamb production.

They currently have approximately 450ha under centre pivot irrigation, growing a variety of crops including poppies and hemp.



Observations and points of interest

We were accompanied by NRM South's Land Program Coordinator Tim Ackroyd to Ratharney where we discussed several aspects of Ratharney's farming operation including the integration of the grazing management tool "Farming Forecaster".

Farming Forecaster is a publicly available decision support program for pastoral grazers. It was developed by multiple farming systems in NSW in close conjunction with Commonwealth Scientific and Industrial Research (CSIRO). This risk management tool provides a road map for pasture growth and livestock performance and comprises two key components. The first is soil moisture probes and rain gauge sites, situated in dryland pastures on participating farms, providing real time data on soil moisture, soil temperature and rainfall. The second is a pasture forecasts showing likely pasture growth trends and availability for the next 3-4 months for each location. This information is generated by the decision-support tool "GrassGro" – a farm simulation model for pasture growth. Weather information is also provided, and all key data is displayed in an easy to interpret format. The software has been modified for regional variances including a Tasmanian platform.

Ratharney has been one of the farms to utilise the tool and has been beneficial to aid decision making and discuss "what if" scenarios. By intervening earlier, the tool should reduce the risk of denuding pasture covers which leads to soil degradation, erosion and topsoil loss.

Chris and Clair are passionate about building a sustainable productive business with consideration to their environmental footprint. They are involved in several projects including the "Tamar River Restoration Project" and a project funded through the University of Tasmania which is focused on "Growing red meat productivity through the selection and establishment of perennial legumes."

The research project aims to enhance the legume component of pastures, improving productivity and resilience for Tasmanian red meat producers. The trials are looking at different legume species and how new sowing practices could advantage legumes during establishment. They will also investigate how to effectively re-establish legumes in grass dominant pastures, potentially removing the need and risk of a full pasture renovation.

Chris is aiming to extend the grazing phase of his cropping rotation to compensate for a reduction in poppy area and provide his soils with a longer rest period. This may lead to environmentally beneficial outcomes including reduced Nitrogen use and reduced soil degradation from extensive cultivation and cropping. The project is ongoing, with no results currently available.

A more recent introduction to the cropping rotation is the incorporation of red clover small seed production under irrigation. Red clover is a valuable break crop with several associated benefits including improving soil structure and nutrient status through Nitrogen fixation. The seed is harvested for small seed production and then grazed intermittently by stock in situ once recovered, providing two sources of income. The intention post-grazing is to "stitch" a diverse pastoral perennial species mix into the stand to reduce conventional cultivation.

Chris and Clair have also partnered with New Zealand Merino, who started sourcing wool from ethical producers in Australia to manage wool supply constraints in New Zealand. To fulfill their contractual agreements the Headlam's ceased mulesing and have had to meet a globally recognised set of standards that cover fleece quality, animal welfare, environmental sustainability, and social responsibility.

The Headlam's are also currently prioritising further development on farm including subdivision, improving stock water access and pasture quality through pasture renwewal on their dryland and irrigated areas.

Containment feeding

The Midlands area is a low rainfall environment, the area is currently experiencing a prolonged dry period. The Headlam's at the time of visit had approximately 3000 ewes and replacements in some form of containment feeding. Containment feeding (similar to "sacrifice paddocks" in New Zealand) is widely practised in the Midlands area and is where stock are confined to small paddocks or pens for a defined period of time (as opposed to feedlots which are considered permanent). Their primarily objective is to supply livestock daily requirements to maintain their core breeder base, preserve projected cash flows and reduce grazing pressure over the remainder of their property until pasture covers recover.

Livestock feed requirements are formulated using whole mixed rations dependant on liveweight age and physiological state (pregnant or dry). Feed grains are an important component of their rations as they can be grown on the property and are balanced with other rations such as processed meals and other alternative feeds or by-products depending on availability and costs. There are several tools and calculators available to help determine suitable feed requirements, rations and gross margins for economic feeding scenarios.

The environmental benefits can be substantial by reducing grazing pressure on ground cover especially their native grasses as well as reducing the risk of topsoil and nutrient losses. Current legislation provides provisions for temporary containment feeding and does not require development consent. Site selection must consider buffer distances around waterways and other environmentally sensitive areas

such as native vegetation, topography, access, soil type, shelter, access to quality water, biosecurity and waste disposal.

Visit number: 2.
Date: 18th Jan 2024
Area: Northern Midland's area
Landowners: Rae and Lindsay Young
Farm name: Lewisham
Total area: 1,124ha
Farm overview: Approximately 6000 poll merinos breeding replacements. Currently 180ha under centre pivot irrigation, used for cash cropping and pastoral grazing.

Observations and points of interest

The Youngs are passionate conservationist and sheep farmers with a key emphasis on the production of ethically produced wool. The farm is Responsible Wool Standard (RWS) accredited. RWS is a global standard developed by the Textile Exchange, an international nonprofit organisation focused on sustainability in the textile industry. The standard key principles are based on various aspects of wool production, including animal welfare, land management, and farm management practices.

Their approach is to utilise conservation principles to farm with the landscape and maintain high standards of animal welfare. Protecting the land and its native inhabitants are paramount for them.

They have made a significant investment into irrigation on farm to improve land use options and to build resilience within their farming system in the face of a notably changing climate where rainfall is becoming unpredictable. They apply sustainable grazing management practices such as rotational grazing, utilising cell grazing principles and grow suitable perennial pastures to maintain pasture covers and quality. Rotational grazing is still relatively uncommon within the Midlands area.

Rae is a trained botanist who operates their own nursery. The nursery has been pivotal not only for planting projects on farm but also for external conservation projects in the Midlands and Highlands area. The Youngs have planted thousands of trees and shrubs on their property through several funding initiatives or funded them by themselves. The areas are strategically planted to provide habitat for a large range of insects and to provide ecological corridors for indigenous birds such as Wedge tailed Eagles and Masked owls as well as other animals such as echidnas and the Tasmanian devil. Their goal is to be a showcase farm for sustainable management.

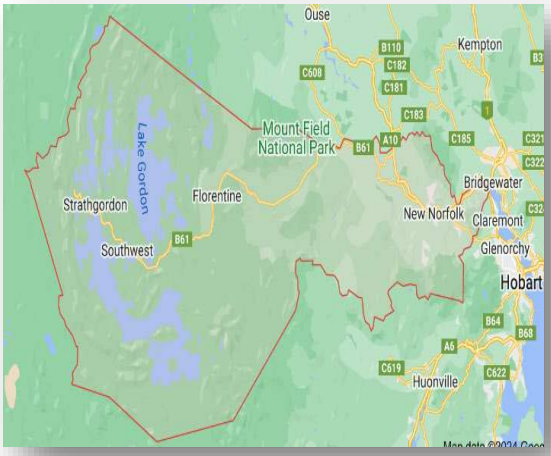
The following photo below demonstrates the whole farm systems planning approach which considers the natural and farming landscape, existing vegetation and other benefits to their current pastoral farming system such as the reintroduction of insect pollinators and shelter for animals.

Recently Lewisham also purchased 900ha of land for conservation purposes near Lake Leake in the Highlands to protect it from logging. Logging of native trees in Tasmania is still permitted in some circumstances.

Raes philosophy when it comes to restoration projects is not to focus on perfection but the direction of travel. Rae is happy to use exotic weeds as canopy crops to improve success rates if required.
Most of the seed used within the nursery is eco-sourced on farm or from their block in the Highlands. They focus on plants they have had reasonable success with.
Several different techniques have been implemented for restoration planting with various success rates, including the use of tree guards and netting cages to reduce grazing pressure from browsing animals such as wallabies, kangaroos and possums. The caged areas are used for native grass and herb species

plots to reduce costs and increase diversity. The current planting project is planted under an existing canopy of regenerating native gum trees.
There was a notable abundance of insect fauna including spiders, moths and butterflies.

Visit number: 3.
Date: 19th Jan 2024
Area: Upper Derwent Valley
Landowners: Tom and Sarah Clark
Farm name: “Back Run” – part of Lanoma
Farm overview: Crossbreed ewes (Poll Dorset/White Suffolk) for fat lamb production and Angus breeding cows with calves sold at weaning. They also have an extensive agroforestry operation with several pine plantations for timber production and a pine nursery.



Observations and points of interest

The second day we visited the Clarks from the Upper Derwent Valley. We were accompanied by Agricultural Extension officer Peter Ball who works for the Derwent Catchment Project (DCP). The DCP are a community-based organisation who are responsible for delivering evidence-based practical on-ground programs that reflect the core issues and management required to address sustainability and

land degradation in the Catchment and is co-funded through local councils. The DCP is governed by a committee of management under its constitution of which Sarah Clark is the vice president.
The DCP are involved with planning, management, facilitation and delivery of numerous on-ground works projects, including weed management, river restoration and revegetation.
The Derwent Pasture Network project (an NRM South- Derwent Catchment Project partnership funded through the Australian Government's National Landcare Program) was developed to support farmers management of dryland pastures particularly north facing slopes using a range of locally relevant approaches and information resources. North facing slopes are seen as a priority as stock will tend to preferentially graze the warmer slopes, increasing grazing pressure and potentially leading to soil erosion if overgrazed.
As part of the DPN extension services, a series of pasture and saltbush forage shrub demonstration sites were set up in the Derwent Catchment, including one at the Clarks "Back Run" property. The Back Run trial site looked at the persistence of several dryland pasture species mixes including several cultivars of Cocksfoot and Phalaris with legumes such as lucerne and sub clover. The trial also considered grazing management (rotational grazing and suitable stock classes), and different establishment techniques in terms of drilling technique and the use of break crops for weed management.

One of the key messages from this site was the benefit of a "whole of catchment" approach. The trial was successful in demonstrating the benefits of introducing suitable pasture species to north-facing site and utilizing rotational grazing management practices to improve pasture covers, pasture quality and persistence but has been partially abandoned due to severe grazing pressure from native browsing animals especially Wallabies due to the improved pasture covers on farm. The neighbouring properties are still using traditional policies including long-term set-stocking practices of animals. The increasing stock grazing pressure especially over summer causes over grazing of dryland slopes. This has resulted in an influx of wallabies on to the Clarks property due to the improved pasture covers. Future endeavors for the Clarks will focus on wallaby proof fencing.
The Clarks are focused on integrating natural landscapes into their land holdings and reducing their environmental impact by riparian zone protection, tree plantings, and careful land management. Tree

planting sites for timber plantations are carefully selected for suitable sites, which can be eventually returned to pastoral use or restored to indigenous vegetation.

To help diversify their farming operation they have planted over 60,000 pine trees and some Eucalyptus nitens in the Central Highlands. The plantings are part of a commercial carbon farming project under the Emissions Reduction Fund Project (ERFP).

The ERFP was established by the Australian government to provide financial incentives to businesses, farmers, and other organisations to undertake projects that reduce or remove greenhouse gas emissions. ERF projects earn Australian Carbon credit Units (ACCUs) for achieving carbon abatement. ACCUs can be sold by establishing a contract, or to other purchasers including businesses and state governments.

The Clarks trees were planted either as forest stands for timber or in wide shelterbelts for shelter and timber production. The Clarks have adopted a two-plantation methodology under the criteria stipulated by the ERFP, where the trees are transitioned from a short to long-term rotation. The shelterbelts are thinned at around year 15, where two of the rows will be replanted with native trees, which will continue to provide shelter for stock after harvest.

The project allows the Clarks to sell carbon credits from the moment the trees are planted to help finance the project. The trees were sourced from their own pine nursery.

ERF projects are selected on a competitive auction process and can include activities such as energy efficiency improvements, waste management (reduce methane emissions at landfill), renewal energy projects and implementing agricultural practices that reduce emissions (increase soil sequestration, methane reduction from livestock, improvements in animal effluent or reduce Nitrogen fertiliser use).

In addition to carbon abatement, projects may achieve a range of other environmental, economic, social and cultural benefits, called co-benefits which can be registered with the project. Examples of co-benefits include:

- increasing biodiversity from the protection and regeneration of native vegetation
- use of traditional fire management practices providing new income streams for Indigenous communities, and
- improved soil health and resilience in the land sector.

For purchasers, ACCUs with co-benefits can offer additional value in meeting sustainability commitments.

Visit number: 4.
Date: 19th Jan 2024
Area: Hamilton, Derwent valley
Nursery owner: Karen Phillips
Owners: Derwent Catchment Group
Name: Derwent Catchment Group Plant nursery
Overview: Commercial native plant nursery

Observations and points of interest

The nursery is owned and operated by Karen Phillips with the support of the Derwent Catchment Project (DCP) and provides a range of hardy native species for shelterbelt and revegetation projects. The seed is sourced locally around the valley for propagation. There is a strong emphasis on treating and preparing the seed well.

The seed is planted in the "warming house" to improve germination rates and then transplanted outside in larger trays to acclimatise the plants to the local climate.

Karen is involved with several restoration projects including the eradication and occasional removal of willows and eventually re-planting of indigenous vegetation for several river systems including the Tyenna river. As in New Zealand, cracked willows are a weed of national significance that degrade water

quality and fisheries habitat. Willows also present a risk to infrastructure and assets as they are shallow rooted and easily dislodged in flood events. They also use considerably more water than native vegetation.

The DCP coordinate a project which utilises a volunteer and employed workforce. They work to eradicate willows from the Tyenna River and re-plant riverbanks with native plants. Most of the work revolves around eradicating Willows by “drill and fill or cut and pasting” techniques from spring through to the end of summer. In autumn and winter, the focus shifts to regeneration with site preparation and planting. Often only the willows that threaten infrastructure such as bridges are removed.

Karen has seen an improvement in local ownership and stewardship with the introduction of projects such as the eradication of Willows around waterways, and a shift to planting natives over exotics for residential property owners.

Interviews

Interview number: 1.
Interview name: Colette Glazik
Date: 20/01/2024
Role: Consultant and Australian 2022 Nuffield Scholar
Topic: Several topics including natural capital accounting and carbon accounting methodology in wool production systems and the different regulatory and legal frameworks that are being constructed around these topics.

Overview

Colette Glazik (daughter of Ray Young, one of the owners of Lewisham) is based in Hobart and is currently completing her Australian Wool Innovation Nuffield scholarship on carbon accounting systems methodologies for wool producing sheep farms in Australia and internationally. Colette is also looking at the carbon footprint of the processing of wool and end of life impact of the garments to provide an accurate and fair reflection of the environmental impacts of all fibres.

Points of interest

Two years ago, Colette and her family farm Lewisham participated in a pilot project called the "Farm-scale Natural Capital Accounting (NCA) project".

Natural capital from refers to the stock of renewable and non-renewable resources (such as plants, animals, air, water, minerals, and ecosystems) that provide benefits to humans and other species. It encompasses the natural resources and ecosystem services that support life and economic activity.

The NCA project provides a standardised set of concepts and methods to measure all the natural capital assets at a farm scale including soil, water, native and exotic vegetation, crops and livestock. The pilot project generated NCA accounts for each of the farms involved in the project including Lewisham which are then displayed on a user-friendly platform under internationally recognised standards for environmental-economic accounting such as the UN system of Environmental Economic Accounting (SEEA) framework.

The idea of the platform is to allow farmers to make more informed decisions around farm management and leverage their sustainable farm practices for commercial benefit when engaging with investors, buyers and lenders. Farmers can use their accounts for evidence-based sustainability reporting to buyers (collect once, share many) who need to disclose their climate and nature risks and impacts and support negotiations with financial stakeholders.

The power of natural capital accounts is to show change over time. The accounts provide a baseline for each farm and can be used as a reference point when reassessments of natural capital are undertaken in the future.

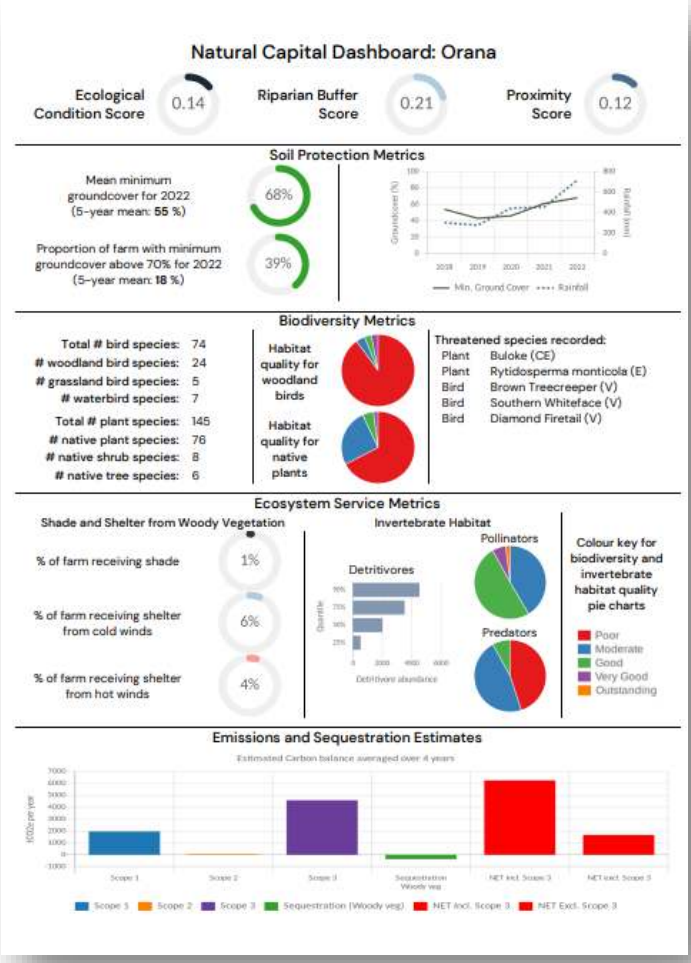
The initial pilot looks promising but requires further development to streamline the process (possibly through computer generated learning) and confirm the accounts for each farm are robust, reliable and repeatable to create demand and recognition on a national and global scale.

The NCA project has been criticised for being too complex and costly, the Lewisham farm assessment costing approximately $80,000. The relevance and applicability of farm scale capital accounts may vary depending on the scale of operations, geographical context and geographical conditions and there will likely be challenges in standardizing methodologies and valuation approaches for different regions.

The real value of Natural capital accounts have yet to be realized. One suggestion will be to help ensure farming business are identifying foreseeable and potentially material nature-related risks that could affect their business either in the form of access to finance, access to markets or potentially their social license to operate.

A company called Agronomeye in partnership with Virtual Tas are currently producing 3D interactive maps using aerial imaging (LiDar) for the entire Tasmanian state, with the ability to integrate live data for a dynamic overview of the farm. There are numerous applications for this platform particularly for natural capital accounting and certification, as well as offering an intuitive "insight" tool for real time farm management decision making especially when used in conjunction with the "Farming Forecaster" app previously discussed.

Example of a natural capital account dashboard



Interview number: 2.
Interview name: Pierre Defourney
Date: 7/02/2024
Role: Midlands Conservation Fund Coordinator with the Tasmanian Land Conservancy
Topic: Midlands Conservation Partnership
Overview:
Pierre Defourney is the current funding coordinator for the Midlands Conservation Partnership (MCP).

Points of interest

The MCP is a joint initiative of The Tasmanian Land Conservancy (TLC) and Bush Heritage Australia (BHA) and was created to protect the natural grasslands of the Midlands catchment and support the environmentally minded farmers of the region.

The MCP is a not-for-profit company funded through philanthropic donors. The MCP model is based around an endowment fund called the Midlands Conservation fund.

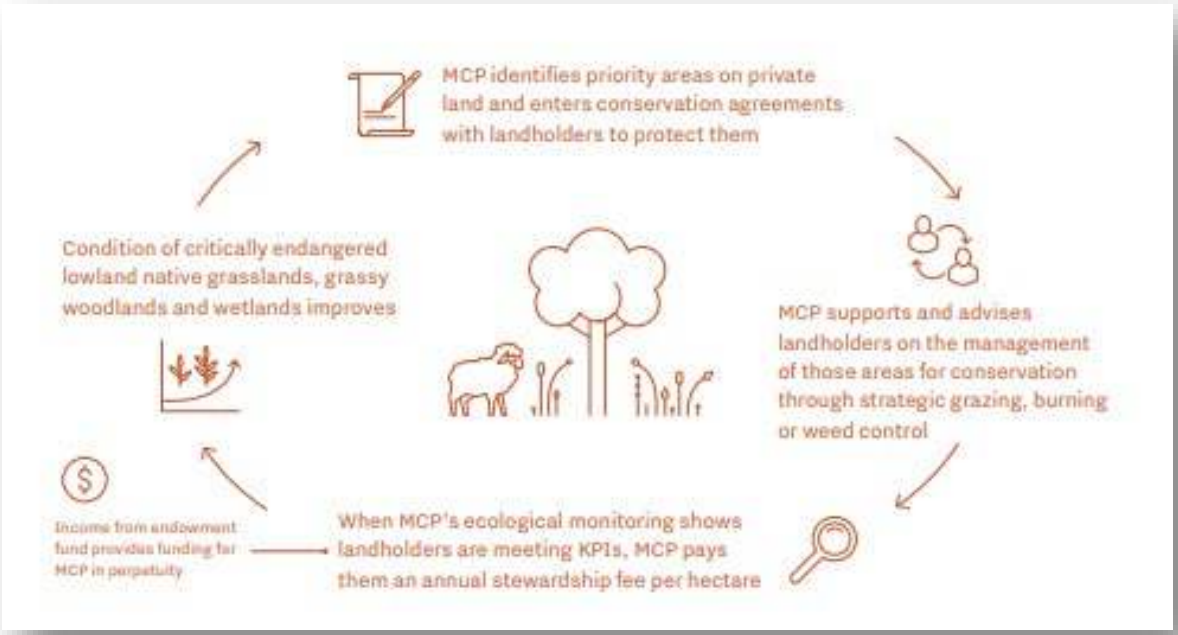
It provides stable, long-term financial support to resource ongoing conservation management on properties secured through agreements in the Tasmanian Midlands.

The MCP ecologist works with farmers to access on a whole farm scale their priority areas for conservation and eventually enter into conservation agreements (as opposed to covenants) with the landowners on 5 to 10-year renewals. The fund is not overly prescriptive and is “outcome focused” rewarding farmers with a stewardship payment if they are meeting their objectives and are able to maintain or improve their monitoring sites on farm.

Ecologists advise on the condition of plants, communities and animals on their land and advises on best management practices to maintain or enhance their conservation areas.

Conservation grazing and potentially fire management practices are encouraged to maintain the ecological integrity of the grassland and providing the appropriate habitat for companion plant species such as orchids.

The stewardship payment is based on the sites “conservation priority” which depends on the type of species or ecosystem present. Generally, the payment is approximately $45 per hectare per year with up to $80,000 currently been paid to some landowners.



The endowment fund should allow a sustainable and predictable source of income. The principal amount of the fund is invested to generate income, and only a portion of the earnings (usually a percentage, often referred to as the spending rate) is spent each year to support the conservation efforts.

The MCL model has allowed on farm support and guidance for landowners and tangible improvements in community engagement. Landowners can leverage off the project to create external value from market incentives or farm assurance schemes.

Some of the criticisms from landowners include a lack of flexibility of the payment schedule over time with increased inflationary pressures and the current model being oversubscribed beyond the means of the funding criteria.

Interview number: 3.
Interview name: Lachlan Van Balen
Date: 15/02/2024
Role: Land Manager for Logie farm
Topic: Carbon inset project and the Carbon and Biodiversity Project Pilot
Overview:
Lachie is the current land manager for Logie farm, a 325ha farm located in South-East Midlands in Tasmania. Logie farm is owned by a subsidiary company of Gowing Bros Limited, a family-owned investment and wealth company in Australia.

Points of interest
"Logie farm" is a sheep breeding and finishing operation which prioritises sustainable practices and conservation. They are involved with a couple of environmentally beneficial projects, the first a 48ha soil carbon sequestration project utilised as a carbon inset program for the Gowing Bros shopping centre complexes. The program is validated and certified through "The Natural Bank". Lachlan is using several restorative techniques to improve soil carbon levels including the use of natural soil conditioners, mineral inputs and direct drilling perennial pastures. They are currently doing no cropping on farm except making hay for contingency or to sell any excess. The soil carbon levels are tested annually, the resulting increase in soil carbon over the total area is quantified and converted to a percentage net reduction in greenhouse gas emissions (termed the 'net abatement') and calculated as tonnes of carbon dioxide equivalent (t CO2-e).
To be eligible for the project it must be maintained 'permanently' (which is currently either 25 or 100 years under the project).
Logie farm are also participating in one of the "Agriculture Biodiversity Stewardship" pilots, called the "Carbon + Biodiversity" (C+B) project. The projects have been designed to increase private sector participation and promote access to the Australian Nature Repair Market. The other pilot is called the "Enhancing Remnant Vegetation" program.
Australia recently became a signatory for the Kumming-Montreal Global Biodiversity Framework (GBF) designed to protect natural capital and limit biodiversity loss. The GBF has multiple goals and targets, including to protect at least 30 percent of terrestrial, inland water and coastal and marine areas and ensuring that at least 30 percent of degraded areas are under effective restoration.
The Australian Nature Repair Market (NRM) is a biodiversity trading platform developed by the Australian government to secure and mobilise finance to reach some of these goals. The market mechanism allows you to buy and sell biodiversity services and provide a new financial opportunity for farmers.
The "Agriculture Biodiversity Stewardship" pilots are testing the concept of buying and selling biodiversity services, by creating new income from plantings that deliver biodiversity improvements and carbon abatement.
The Logie farm C+B pilot project is a 60ha re-planting site and registered for a term of 25 years. The species planted are required to be eco-sourced locally and endemic to the specific region.

Participants under the C+B Pilot are required to establish and maintain environmental plantings consisting of a mix of native tree and shrub species that provide benefits for biodiversity. Projects will also be subject to measurement, reporting and verification requirements under the ERF and C+B Pilot. The projects undertaken in the C+B Pilot will be eligible to receive:

- Australian Carbon Credit Units (ACCU) for the carbon dioxide they sequester in the plants if they comply with the Emissions Reduction Fund (ERF).
- Cash payments for the biodiversity benefits they provide. Projects are ranked by their benefit-cost score and selected on a competitive basis. Biodiversity benefit scores are based on the predicted future biodiversity value of the site and its contribution to regional biodiversity conservation.

The biodiversity payment covers a portion of establishment costs, depending on the project, and considers:

- projected ACCUs a project could earn.
- cost of establishing and maintaining the planting/s.
- cost of reporting.
- which include the cost estimates and the projected benefit score.

The Logie farm project have been awarded $250,000 to supplement the initial fencing (5km of fencing) and planting (35,000 native trees, shrubs and grasses) costs. Once the trees are established there are provisions allowed for intermittent grazing within the site. The carbon abatement achieved is based on the change in canopy cover using the most recent Geographic Information System (GIS) photography. Lachlan is unlikely to make a claim until atleast year 5 due to the slow establishment and growth rates of plants in their dryland environment and the administrative burden of submitting a report which is subject to inspection.

From the six initial interested landowners in the C+B pilot, only the Logie farm application proceeded to the funding stage as others found that maintaining the project for 25 or 100 years an unrealistic time commitment, as it would leave the potential burden for the next generation to administer and maintain. There was also concern around the practicality and delivery of the application process and the lack of intrinsic support and resources to maintain the project from a monitoring and reporting perspective.

The “Enhancing Remnant Vegetation (ERV)” pilot project in South Tasmania to date has had a much better uptake due to more favourable and flexible terms such as the shorter time commitment, greater scope in terms of native vegetation and the mechanism required to capture regeneration which the C+B Pilot did not.

The areas must have remnant vegetation management areas which comprise up to 20% of the total management area and must undertake one or more eligible management activities such as grazing control and weed and pest control.

The payment comprises a rental component for conservation purposes and a management activity payment to covers the costs of management.

Notably, the rental component will be calculated based on the estimated value of the total management area (i.e. both the remnant management areas and any revegetation areas) and be paid annually over the 10-year project period. Payments will rise by 3.5 per cent annually to account for increasing land values.

To incentivise greater uptake of conservation projects of this nature especially for private landowners Lachlan suggested additional mechanisms could be considered such as tax exemptions, environmental accounting rebates or potentially in setting programs where investments in carbon and biodiversity improvements made on farm could be used to repay property loans.

Discussion – Incentivising nature positive solutions

"A shift in attitude is emerging regarding the responsibility we all share for conservation and how nature is valued at political, commercial and community levels. Concepts such as valuing nature as capital, sharing natural resources, community solutions to local issues and business investment in sustainable programmes are all gaining wider acceptance and endorsement".

James Guild – QE11 National Trust 2013 Chairperson

The term "nature-positive outcomes" refers to actions and practices that benefit nature and contribute to the conservation and restoration of biodiversity, ecosystems, and natural resources. Our diverse natural ecosystems of New Zealand are recognised as unique due to their geographical history and absence of native land mammals and thus requires thoughtful and targeted responses to conservation efforts.

Private landowners play a key role in resolving some of our biggest environmental challenges including the protection and enhancement of our natural ecosystems. Sheep and beef farms in New Zealand are recognised as holding a large percentage of our remaining privately owned indigenous vegetation and therefore have a disproportionate responsibility to protect it.

To create real behavioral change within the sector, farmers needed to be incentivised to act and create nature positive improvements to their own environment.

There are many reasons for farmers and growers wanting to improve their environment and it is usually a mix of practical and personal reasons. For many farmers the desire to pass on a legacy for future generations is a main motivator, with financial incentives a supporting factor.

The increased activity in conservation and sustainable land management increases competition for limited funding and resources. New Zealand is a small country with a huge conservation challenge and a small economy to fund that challenge. A balance needs to be found in the provision of conservation between the private sector, the non-government sector and the public sector. The conservation dollar could be made to go further by pooling resources, sharing knowledge and encouraging people and business nationwide to be more involved.

There are a number of different tools which can be used to incentivise farmers and private land owners, which can be either financial or non-financial. From a financial perspective this can be achieved by two means, improving returns or decreasing costs.

To reduce costs associated with improving sustainability on farm, the main vehicle is through the finance sector which has developed an array of sustainable finance options. Agribusinesses are now able to link their sustainability objectives to their cost of debt, with incentives tied to the customer's ability to meet pre-agreed sustainability targets with internationally recognised methods to prove the improvement.

The most common being sustainability-linked loans, which encourage uptake through reduced interest rate margins or preferential long-term loans for agri-businesses that meet their specific sustainability standards.

A combination of regulatory, market, and strategic factors are influencing financial institutions in New Zealand to create sustainable finance initiatives that usually incorporate Environmental, Social, and Governance (ESG) considerations. ESG refers to an internationally recognised set of criteria used by investors to evaluate the sustainability and ethical impact of their investments. There are several internationally recognised frameworks, the United Nations Environment Programme Finance Initiative (UNEP FI) is one of the most familiar. Financial institutions use the frameworks to align their goals with

the goals set out by the Sustainable Development Goals (SDGs) and the 2015 Paris Agreement adopted under the United Nations Framework Convention on Climate Change (UNFCCC).
Banks are also influenced by national and international standards related to sustainable finance such as the Task Force on Climate-related Financial Disclosures (TCFD), Taskforce for Nature related Financial Disclosures and the Principles for Responsible Investment (PRI). Large financial institutions are encouraged and in some cases required to disclose information on their climate related performance and activities to improve credibility.
Careful consideration of the risks associated with these types of loans needs to be evaluated for each agribusiness as they often pose challenges in terms of complexity of measurement and reporting as well as potential costs of compliance.
There has been a rise in the use of "green banks" globally, which are financial institutions dedicated to financing projects and initiatives aimed at promoting environmental sustainability. These banks provide targeted financial products and services to support "green" projects that might otherwise face barriers to financing through traditional channels. The use of green banks can have numerous benefits but often face challenges related to funding constraints and fragmentation within the market due to inconsistencies around the standards used for monitoring and the evaluation of measured outcomes in terms of the contribution to sustainability goals.

Improving returns for landowners with good environmental credentials can be achieved through multiple mechanisms, most of which require some form of market place to function. The markets are usually either mandatory or voluntary. Mandatory markets rely on government compliance and enforcement to create behavioural change while voluntary markets are optional and are often self-regulated with a wide range of standards.
One of the most common tools applied in New Zealand is certification programs for meeting minimum environmental standards to access premium or value add markets. Certification programs such as seen for organic farming, the New Zealand Farm Assurance Programme Plus and the New Zealand Merino ZQRX programme are examples of which have achieved a premium to suppliers at some point of time. Certification programs can create differentiation with the market and improve the brands reputation but often the extra value is not always realised as this oftens progresses to a prerequisite for market access.
Another well established and contentious incentive is the rise of the carbon commodity markets. Carbon offset markets were introduced as a mechanism to encourage GHG emission reductions and for governments to meet regulatory frameworks such as the Kyoto protocol and the Paris Agreement. The most well known in New Zealand is the Emissions Trading Scheme (ETS), a cap-and-trade market which essentially monetises the environmental benefit of trees sequestering carbon.
The platform, especially in marginal land often creates a greater value for carbon stored in timber than the timber it-self. The recent rise in land values for hill country is widely attributed to the way the NZ ETS functions, resulting in the transition of pastoral land to pine forest also known as "carbon farming". The rapid land use change particularly within our sheep and beef sector and our rural communities has been widely felt especially from an environmental and social perspective. The recent rise in adverse climate related events has highlighted the incentives for our landowners need to be strategic and inherently correlated to the land use capability.
The NZ ETS has been recently amended, however there remains criticism over the limited impact on emission reductions to date for several reasons including the ability for industries to be able to offset

their emissions through the purchasing of cheap international carbon credits and the significant price volatility over the last couple of years.
Carbon insetting schemes are designed to reduce the carbon footprint by implementing carbon reduction measures within their own supply chains or operations as demonstrated at Logie farm for the Gowing Bros, as opposed to carbon offsetting, where companies invest in external projects to compensate for their emissions.
Although not widely used at a farm scale this could potentially be a valuable strategy for landowners to promote their environmental credentials and capture more value from their natural resources. Based on internationally recognised frameworks and targets, agriculturally based organisations are often required to reduce their indirect emissions, of which the primary constituent comes from the farms who supplies them.
The role of carbon in-setting programs have been criticised as the term and methodology is not well defined and the schemes are often not fully integrated into value chains.

The rise of biodiversity credit (or offset) markets has allowed a more holistic approach to environmental conservation and sustainable development. Biodiversity markets are becoming increasingly common globally, particularly in regions where development activities may have significant impacts on natural habitats and biodiversity. Biodiversity credits are usually a type of environmental offset or compensation mechanism designed to mitigate the negative impacts of development projects on biodiversity.
The real opportunity lies in additionality where suppliers of these credit are rewarded by the sale of credits to a willing buyer for the improvements in biodiversity. Proceeds from the sale of credits would provide the landowner with funds to either offset the reduced income or refund the work to protect the biodiversity. An investor can expect returns from biodiversity credits, either through their financial value (as with carbon credits), providing environmental offsets and for marketing purposes. The New Zealand government is currently investigating the establishment of a large public sector biodiversity credit market.

Some of the other options which are not widely used nationally but are common overseas is the use of government subsidies and grants for practices that promote biodiversity such as agroforestry, cover cropping or creating wildlife habitat. The most common are long-term land stewardship agreements and “Payment for Ecosystem Services” (PES).
Essentially the government pay, on a willing buyer willing seller basis, to manage for the outcomes they want, in effect having a customer for the provision of environmental services.
PES programs are often designed to compensate farmers for ecosystem services including biodiversity conservation, the higher the number of restrictions generally the higher the payment. Long-term agreements between farmers and landowners, such as conservation easements or land trusts, can incentivise investments in natural capital by providing assurance of continued land stewardship and potential financial compensation.
Government backed schemes can provide certainty around income for farmers but are often criticised for resource and funding constraints required to administer and monitor the sites for compliance and credibility. However, in my opinion where a project is of high ecological importance but lacks significant resources or the opportunity to provide revenue for land owners, public sector funding should be considered.
A more novel approach is called “impact investing” where sustainable finance can be channeled into a meaningful environmental cause, with a known measurable outcome.

One of the tradable commodities in these markets are science backed or verifiable environmental positive impacts where private individuals and organisations can buy claims such as increasing soil carbon levels or limiting Nitrogen use by reducing Nitrogen fertiliser on farm. The benefit will be realized though a payment or another form of commodity such as carbon or biodiversity credits.
The markets will offer a great opportunity for landowners. However, caution is needed as it is a reasonably novel finance vehicle and raises concerns around market uncertainties as well as the complexity and integrity of the measuring required to substantiate the claims and potentially data privacy and security concerns.

The non-financial motivators to private landowners are not easily defined. Improvements in environmental outcomes often involve a huge commitment of time, energy and sometimes financial sacrifice.
Often people develop a strong sense of identity and belonging to an area, a landscape, a way of life and a community. Strong social connections strengthens the desire to contribute to the well-being of the community and the collective responsibility for maintaining or enhancing it. There is often a desire to make a difference and contribute to the public good beyond the needs of themselves and to enjoy our remaining natural spaces.
The owners of Lewisham farm are examples of people incentivised by non-financial means, motivated by their desire to improve the integrity of their natural ecosystems and to inspire the community they live in. For us it is the continuation of our family legacy, to be respectful guardians of the land and the connection to our community.
Enforcing regulations to improve sustainability on farm can offer numerous potential benefits and provide in essence a national bottom line for the protection or enhancement of our natural resources. However, policy makers need to carefully consider the challenges associated with the implementation of the intended outcomes including the compliance burden, the associated extra costs, the potential reduction in farm revenue and the unintended consequences as seen in the carbon trading markets.

Key findings from the tour

The trip to Tasmania and resulting connections made with farmers and industry provided useful insights into how landowners are creating value in their farming businesses by promoting their environmental credentials.

There seem to be a raising awareness of farms recognising the interconnections between on farm practices and ecosystem health.

The natural grasslands of Tasmania are recognised for their significance and several conservation efforts are being pursued by organisations and engaged landowners. Landowners are often provided guidance and support, complimented by sometimes innovative and enduring governmental and/or private sector funding models.

Projects such as the Midlands Conservation Partnership were often outcome focused and not overly prescriptive, which allowed for greater flexibility, and community engagement. The model supported the integration of targeted pastoral grazing to maintain the grasslands and rewarded the landowners with stewardship payments.

To create certainty for landowners some of the key messages were the need to make the funding payment incentives reliable and enduring and didn't create roadblocks for farm succession.

Integrated catchment management was noticeable through the planting and establishment of ecological corridors around their main waterways but sometimes lacked cohesion in terms of best management practices on farm. This occasionally led to unintended consequences or poor outcomes for early adopters. Further extension support for landowners would be valuable for the region to promote the benefits of catchment scale solutions.

The Australian government have created carbon and biodiversity marketing platforms to improve environmental outcomes and generate greater returns for landowners that will be able to compete with alternative land uses.

Landowners will be able to leverage their environmental performance if they are able to measure and prove their outcomes. Invested corporates, governments and investors will be able to purchase the farm scale data directly from landowners to potentially support their own claims.

The Natural Capital Accounting project and other emerging technologies will try to bridge the gap by creating a reputable science-based platform which accounts for all-natural capital on farm and provide an instrument for landowners to improve their environmental management.

The tour reinforced our position on the importance of our tussock grasslands and the complimentary nature they provide to our current farming system. New Zealand's agricultural sector farm management practices and the extension services provided are world leading and we didn't see any practices that would make us change what are currently doing on farm.

The key message for us was that as farmers we need to sell our story better and be rewarded for the tangible and verifiable environmentally beneficial outcomes we have and want to attain on our farm.

Significance to the New Zealand primary sector

Tussock grasslands are vital ecosystems that provide a wide range of ecological, economic, cultural, and recreational benefits to New Zealand. New Zealand's topographical features, low natural fertility, temperate maritime climate all favour our current pastoral grazing systems.

The benefits from livestock grazing within our natural grasslands can be significant. Grazing can help maintain biodiversity in tussock grasslands by preventing the dominance of invasive species and promoting the diversity of native plant species as well as contributing to nutrient cycling through the transfer of dung and urine. They can contribute to improved water quality and hydrological process in our waterways and are a cost-effective fire management tool to reduce the risks of wildfires.

However, they often do not get the accolades they deserve and do not provide the market incentives for our farmers to continue or enhance their preservation. Current incentives are focused on our commitments to reduce or offset our Green House Gas (GHG) emissions and promote the establishment or regeneration of woody vegetation.

The incentives need to carefully considered and balanced, especially for our fragile but richly diverse grasslands of New Zealand.

Financially incentivising our farmers to protect our grasslands could be achieved through multiple mechanisms depending on the specific context, goals and stakeholders involved.

This may include direct payments for ecosystem services or stewardship payments that maintain or enhance the grasslands to compensate for the opportunity cost of conservation. Novel financing options such as endowment funds and other philanthropic funds being leveraged through a pooled collective such as catchment groups could be an innovative financing solution. The Midlands Conservation Partnership is a great example of a progressive conservation relationship between the public and private sector.

The proposed New Zealand biodiversity credit system may present a valuable means to garner private and philanthropic sector support to address biodiversity loss and promote conservation.

To create a well-functioning market, the platform needs to demonstrate real impact across ecosystems and provide landowners sufficient funds to either offset the reduced income or refund the work to protect the biodiversity. There are several considerations that need to be addressed, such as what constitutes a credit and the long-term impact of who might own and control biodiversity on private land. For diverse ecosystems such as tussock grasslands the cost associated with the reestablishment or re-planting of landscapes need to consider the true value of diversity within each habitat, not just the costs used in typical forestry establishment models.

The carbon trading platforms constructed for greenhouse gas emissions are a reminder that the role of biodiversity credits should be a contribution towards the restoration of our ecosystems in the form of additionality, not just an offset. There has been global condemnation of carbon offset schemes, especially the deforestation offset schemes which have been accused of been used primarily for marketing purposes without making meaningful contributions to reducing emissions, also known as "Greenwashing".

New sustainability frameworks such as the Science Based Target Initiatives (SBTI) and the Science Based Targets Network (SBTN) initiative will regulate the use of offsets, emphasis emission reductions and help organisations to track and progress science-based targets for natural capital.

From my perspective the trading platforms should consider the co-benefits tussock grasslands could have in the form of biodiversity and carbon storage if adequately managed.

Grasslands store approximately one third of the global terrestrial carbon stocks and can act as an important soil carbon sink. Improved grazing management and biodiversity restoration can provide low-cost and/or high-carbon-gain options for natural climate solutions in grasslands.

In essence the value of natural capital needs to be equal or greater than the production system the land use can provide. In the context of commodity credit markets, the practice of "stacking" or combining

multiple sources of credits or benefits for the same project could be beneficial to capture as much value as possible to compete with alternative land use options.

As agriculturally based organisations aim to reduce their own environmental and emissions footprint including their indirect emissions produced on farm, the advent of verifiable, repeatable and internationally reputable natural capital accounting systems could be an important tool required for data exchange and allowing greater financial prosperity for farmers.