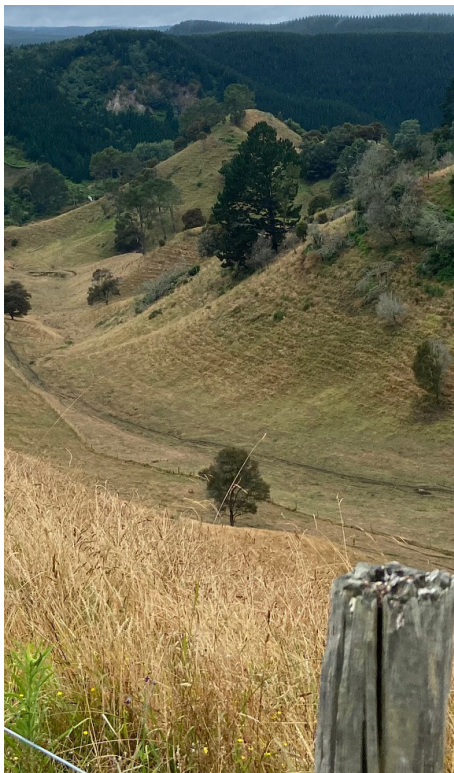




New Zealand Farm Forestry Association  
Oranga Rākau Aotearoa



**BOP FARM  
FORESTRY  
ASSOC.**  
*Field day*



***“TOWARDS FRESH WATER IMPROVEMENT”***

Thank you for providing lunch:





# RUN SHEET

BOP FFA Field Day - 2 November 2023 - Towards freshwater improvement  
Ann & Will - Ao Marama Farms, 699 Pongakawa Bush Rd

Duration (minutes)	Start	Finish	Speaker	Topic	Location
0:40	9:30 am	10:10 am	BOP FFA Team	Put out Field Day signs on road edge and post people to direct vehicles	Direct vehicles from house entrance (647) to tanker track (next up the road) and direct around milking shed, along race to Stop 1.
0:10	10:10 am	10:20 am	Graham West - NZ FFA	Introductions of the Property owners and supporting organisations	
0:20	10:20 am	10:40 am	Ann Cameron & Will Nettleingham	Welcome by property owners and outline of their land use plans	
0:20	10:40 am	11:00 am	Thomas Grant - BOP RC	What is the new regulatory framework for Fresh Water Management .	Stop 1. Assemble at top of the valley and leave non 4WD vehicles here. View over farm and down the valleys toward river. Consider farm hydrology and run off. Look at recent land use change, fencing and view commercial planting issues
0:10	11:00 am	11:10 am	Ian Tarbottom - Balance agri-nutrients	Fertiliser developments to slow nutrient loss	
0:20	11:10 am	11:30 am	Graham West - ForestX	View steep land conversion to forest, what to plant and why	
0:15	11:30 am	11:45 am		Move to next stop	Drive vehicles down valley and stop at native planting
0:20	11:45 am	12:05 pm	Alison Dewes - Wai Kokopu Society	What recent catchment and water quality progress has been made and what was learnt	Stop 2. Assemble at bottom of valley and adjacent native planting. Discuss WKK progress. View broader scale native planting on hill sides and practical issues. Then walk through to the river
0:20	12:05 pm	12:25 pm	Stef Kincheff - Hardwood Management	View riparian planting - development steps, what works	
0:20	12:25 pm	12:45 pm	John Burke - Wai Kokopu Society	Summary, what we have learnt and do we need to know	Stop 3. Overlooking spring and river. Discuss Fresh Water policy development and support group collaboration. Summarise field day
0:05	12:45 pm	12:50 pm	Richard Hart - BOP FFA	Thanks and acknowledgments – lunch arrangements	Stop 3. Acknowledgments and directions for lunch
0:15	12:50 pm	1:05 pm		Travel back in convoy to empty Farm Managers house	Just past the cowshed, on left
0:55	1:05 pm	2:00 pm		Lunch and informal discussion	

# AO MARAMA FARMS

## Farm Performance Summary

Ao Marama Farms	2020/2021	2021/2022	2022/2023	Change from Base
Effective Area (ha) Incl. Beef + Land	250	250	235	-6%
Peak Dairy Cow Numbers (Oct)	749	664	444	-41%
Milk Solids per Cow (Kg)	290	295	338	17%
Imported Supplement/cow (T/DM)	1.0	1.2	0.2	-80%
Homegrown Feed (T/DM/yr)	None	None	240	
Pasture Harvest (T/ha/yr)	11.5	10.0	11.3	-2%
Nitrogen use per grazed Hectare (Kg)	178	104	106	-41%
Average Nitrogen Loss Effective Area (Kg/ha)	73	51	39	-46%
Average Phosphorus Loss (Kg/ha)	7.9	7.3	6.1	-23%
Green House Gas (eCO2/Kg/ha/yr)	7,837	6,694	5,274	-33%
<i>*Nutrient Losses and GHG have been calculated using Overseer v6.5.3</i>				

“This farm is a once-a-day milking system, on challenging land. Significant changes have been made to the system over the past four seasons. This has resulted in a far less intensive system and large modelled reductions in nitrogen, greenhouse gases and phosphorus losses. The farm is set up in a reasonably steady state for the future, with built in resilience and reduced pressure on the land, animals and people.

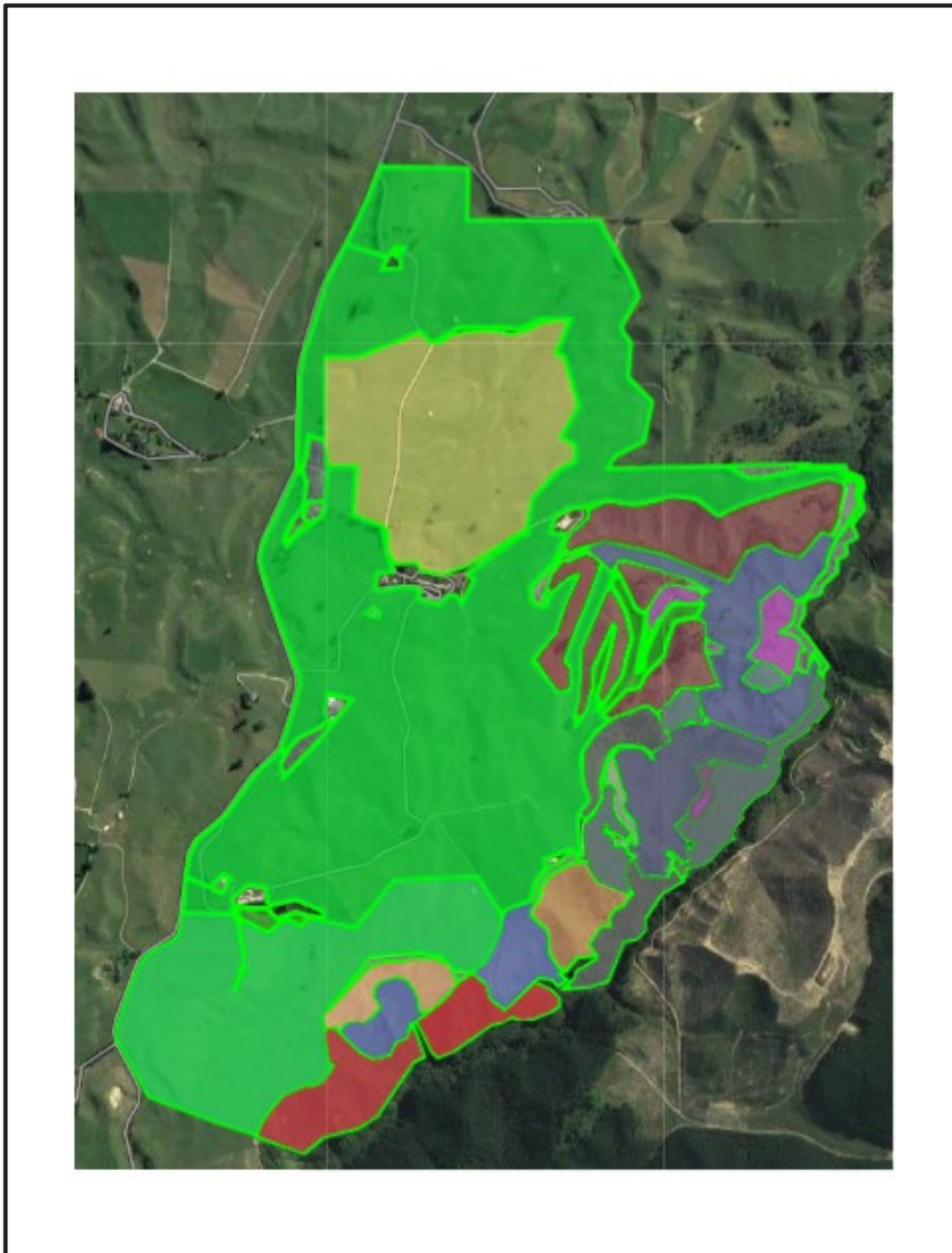
### Other key points of interest:









- Effluent is applied to 38 ha
- Total N loading on effluent area is 109kg/ha/yr.
- Critical Source Area challenges: Steep slopes, erosion from tracks and races, high water runoff volumes through ephemeral flow paths, valleys.

Block Soil Tests (75mm)	Olsen P (2021)	Olsen P (2023)
Effluent	56	46
Main Milking Area	60	58
Tiger Country	46	26



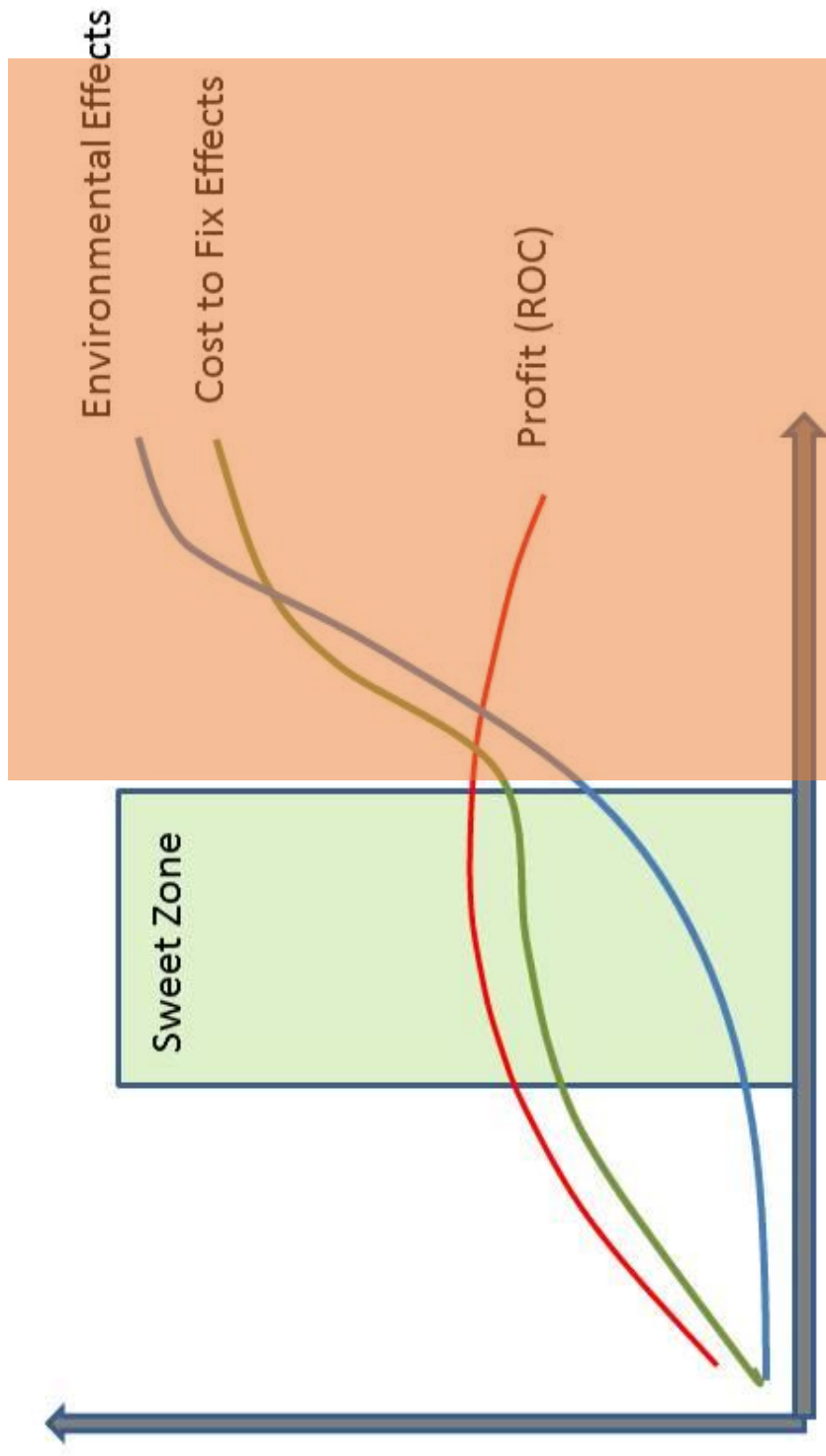
# Overseer Block Map - Ao Marama 2023



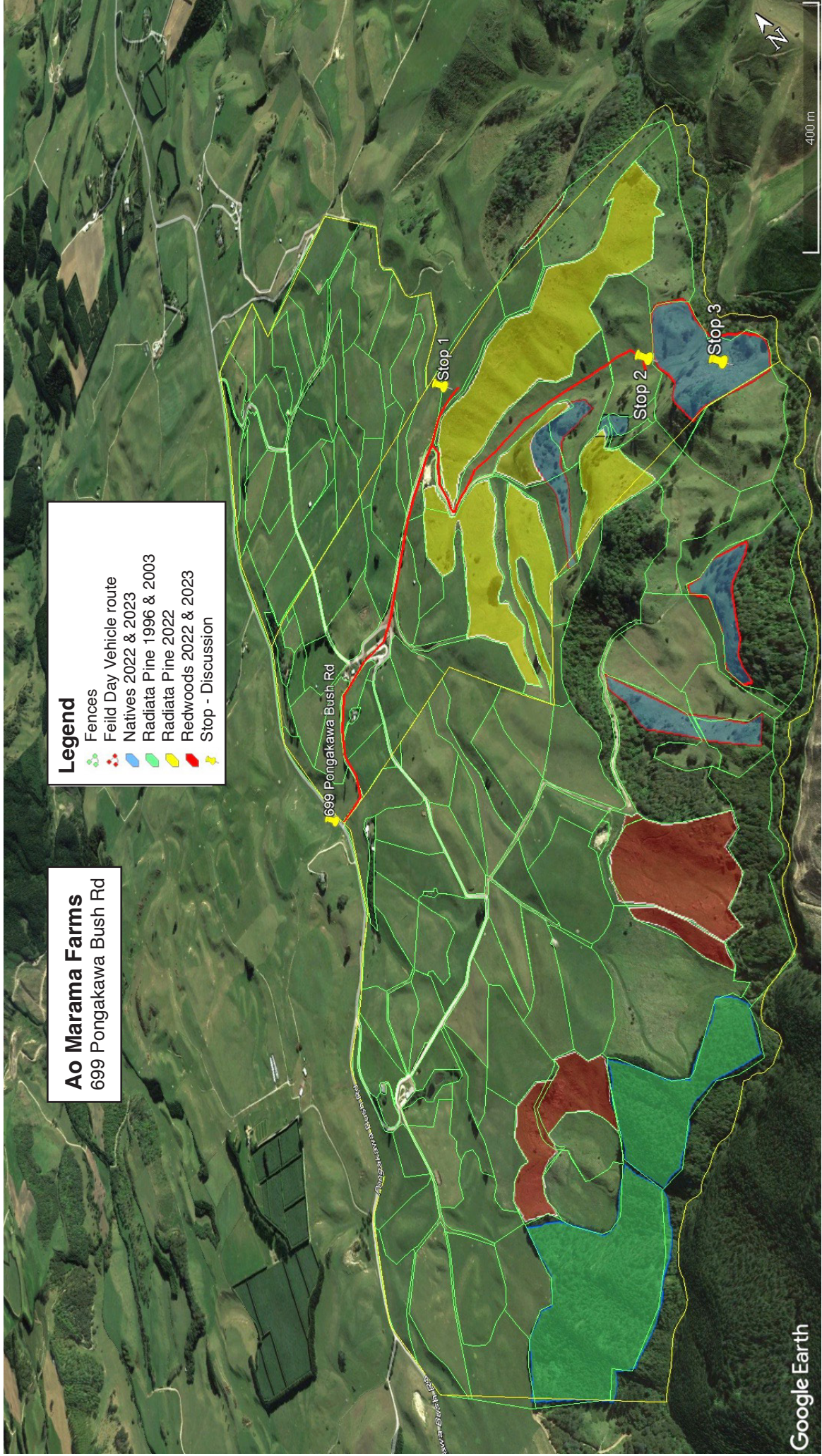
	Main Milking Platform
	Effluent Block
	Tiger Country/Beef +
	Old Pines
	New Pines
	Redwoods
	Existing Native
	New Native Plantings

# The Sweet Zone

## Physical Indicators







**Ao Marama Farms**  
699 Pongakawa Bush Rd

- Legend**
- Fences
  - Feild Day Vehicle route
  - Natives 2022 & 2023
  - Radiata Pine 1996 & 2003
  - Radiata Pine 2022
  - Redwoods 2022 & 2023
  - Stop - Discussion



# Landuse and Potential Landuse

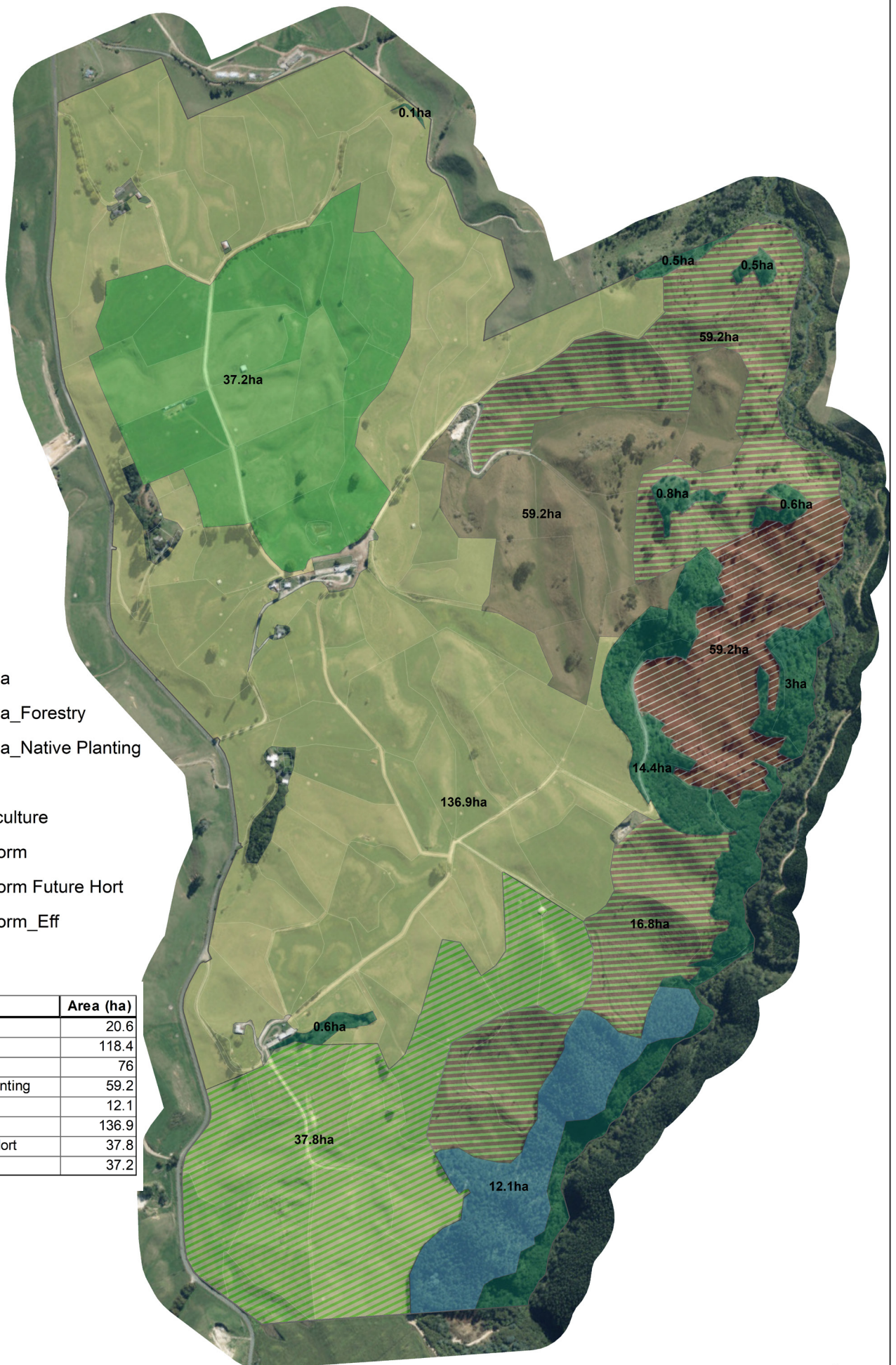
Ao Marama

## Legend

### Landuse

-  Bush
-  Drystock area
-  Drystock area\_Forestry
-  Drystock area\_Native Planting
-  Forestry
-  Future Horticulture
-  Milking Platform
-  Milking Platform Future Hort
-  Milking Platform\_Eff
- 

Landuse_Ty	Area (ha)
Bush	20.6
Drystock area	118.4
Drystock area_Forestry	76
Drystock area_Native Planting	59.2
Forestry	12.1
Milking Platform	136.9
Milking Platform Future Hort	37.8
Milking Platform_Eff	37.2



0 100 200 400 600 800 Meters

Sourced from the LINZ Data Service and licensed to Zealand licence

Author: S Dudin  
Date: 21/01/2022





# Land Use Capability

Ao Marama

LUC	Area (ha)
3e5	106.8
4e5	54.6
6e15	42.9
6e4	64
7e2	58.3

## Legend

### LUC

- 3e5
- 4e5
- 6e15
- 6e4
- 7e2

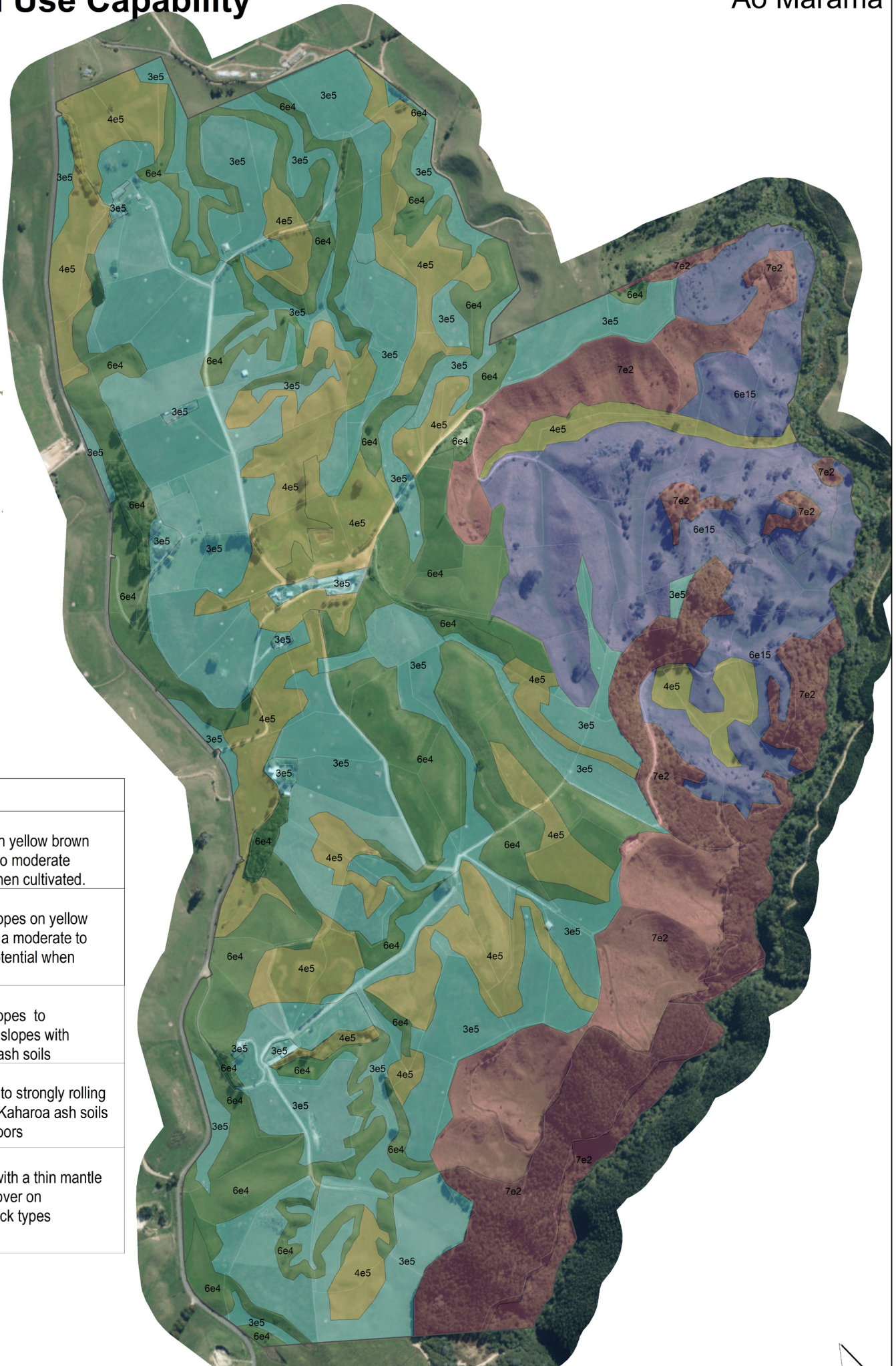
### LUC Unit

- 3e5**  
Rolling slopes with yellow brown loams with slight to moderate erosion hazard when cultivated.
- 4e5**  
Strongly rolling slopes on yellow brown loams with a moderate to severe erosion potential when cultivated.
- 6e4**  
Strongly rolling slopes to moderately steep slopes with shallow Kaharoa ash soils
- 6e15**  
Moderately steep to strongly rolling slopes with deep Kaharoa ash soils and wide valley floors
- 7e2**  
Steep slopes on with a thin mantle of Kaharoa ash cover on unconsolidated rock types

0 100 200 400 600 800 Meters

Sourced from the LINZ Data Service and licensed for Zealand licence

Author: S Dudin  
Date: 23/05/2022



# Planting Plan

## For:

### Ann & Will

Ao Marama Farms  
647 Pongakawa Bush Rd  
Paengaroa

This report develops a plan for tree planting on steep sidlings in the eastern paddocks adjacent the Pongakawa river. The report provides maps of suggested planting areas, measures areas, provides estimates of required trees stocks, and works out costings. The tree species considered for this plan are Radiata pine, and Coast Redwood.

## Prepared by:

**Graham West – Registered Forestry Consultant - ForestX**  
Email: [graham.west@forestx.com](mailto:graham.west@forestx.com) Telephone: 0274 410353

## Background

The Ao Marama Farms property has a gently rolling contour with some steeper sidling's on the eastern boundary near the Pongakawa River. The total property area is 329 hectares with elevation ranging from 40m – 110m. Rainfall is estimated to be 1500mm/ year. The property has extensive dairy races surfaced with pumice and has two pumice pits for further roading material.

The farm owners are considering their medium-term business objectives. They wish to reduce farming intensity and associated with that goal, want plant trees on some of the steeper sidling's and river riparian zones. The property is part of the Wai Kokopu Society (WKS) initiative which assists landowners with their improvement of environmental performance, especially water quality.

In 2021, a Land Use Capability Survey was completed by WKS. This was undertaken to help understand the land resource and support land use decisions. A comprehensive Farm Plan was completed by WKS and included whole farm economic modelling (by P. Journeaux) of various scenarios for land use change.

In early 2022 the farm collaborated with the WKS in fencing a riverside area at the end of a valley and was planted in natives during the 2022 winter. Concurrently, ForestX was asked to provide advice on planting commercial tree species and to provide a planting plan.



Existing areas of steep land near the river in the Southeast of the property had previously been planted in radiata pine. The first area of 7.8ha had been planted about 1980 and was harvested and replanted in 2006. A second area of 4.1ha was planted in 1996 and has been registered in the ETS.

To aid farm environmental goals, a tree planting plan was needed that focused on retiring additional areas of steeper land. The general criteria applied in site selection was land that had slope greater than approximately 26 degrees (LUC Class 6) would be considered for commercial and native forestry. Land with less slope was retained in pasture for occasional grazing, access, and recreational use.

The intention was to plant where possible within current fencing and hence achieve a minimum of fence restructuring costs. However, some new fencing was required, especially to place new boundaries along contours. Existing access tracks and setbacks from power lines and fence lines were not to be planted.

Another land use objective was to participate in the Emissions Trading Scheme and hence focus on forest species that maximised that opportunity for replacement revenue. A map of the property boundaries, paddock fencing and existing planted areas was supplied electronically. This was a significant help. Also, during a Wai Kokopu field day, discussions by the broader catchment group on areas for retirement, planting ideas, and suitable species, were all very helpful in the decision making process.

While many species options for fast growing exotic forests are available, the option of planting radiata pine was considered a first choice followed by redwoods and natives where longer-term forests may be required. Planting other species such as poplar, nut trees, tagasaste, and autumn colour species, will be added by the owners to enhance aesthetics and improve biodiversity.

This report develops a planting plan for Radiata pine and Coast Redwood by mapping and costing the operation for planting in winter 2022. Areas of planting of mixed native species was arranged by the owners.

## Mapping

After a follow up on-site discussion and tour of the farm, potential planting areas were identified, and planting areas by species within paddocks and legal boundaries sketched onto a draft map.

Several blocks in the northeast corner of the property were identified that suited current fencing. Where possible fencing and planting would follow contours and avoid straight lines. This will leave the valley bottoms clear for aesthetics, access, and occasional grazing (see map).

Table 1 gives the block number supplied, the mapped area and the suggested allocation of species. All areas exceed or meet the 1 ha minimum size for ETS registration.

Table 1: Blocks and areas for planting in 2022

Species	Planting Block No.	Area (ha)	Species Totals
Radiata pine	1	11.80	
Radiata pine	2	2.17	
Radiata pine	3	6.15	20.12
Redwood	4	3.76	3.76
Mixed Natives	5	0.89	
Mixed Natives	6	1.24	2.13
Wai Kokopu		3.60	3.60
	Total	29.61	29.61

## Tree stocks

There has been strong demand for tree stocks of commercial plantation species and we encouraged early planning and ordering of stock by November, prior to planting the following winter. The tree seedlings or cuttings should be from highest quality genetically improved stock available and can be sourced from range of nearby forest nurseries in the Central North Island.

The radiata seedlings were from Waimarino Tree Resource, a forestry nursery at Raetihi. The seedlings were bare rooted, genetically improved (control pollinated, CP) stock that have come from a 70+ year tree breeding programme. This results in faster growth of straight stems with smaller branches and higher density wood.

The Coast Redwood seedlings were supplied from ArborGen Australasia, at Te Teko. These trees are container stock, i.e., grown in trays of root trainers, and come out as plugs. They have soil around the roots and are slightly more resilient than “open rooted” seedlings that are commonly used, e.g., with pine lifted from nursery beds.

We received the following description of their genetic background. *“The redwood being grown at Te Teko this year is from seed imported by ProSeed; Seedlots 21855 & 20637, both from Zone 97/495 bc. Zone 97 is in the coastal area near Santa Cruz, so very much the southern part of the range. Won’t be very cold hardy but should be ok for Eastern BoP.”*

The property owners have sourced the native species themselves using the Wai Kokopu and BOP Regional Council connections. Hence costs have not been calculated.

Table 2 gives the suggested tree spacing for planting and the estimated trees stocks required.

Table 2: Tree stockings and number required.

Tree planting regime					
Species	Spacing	Stocking/ha	Area mapped (ha)	Tree stocks	Stock order*
Radiata pine	4m x 3m	833	20.13	16,768	17,600
Coast Redwood	4m x 3m	833	3.76	3,132	3,300
* 5% contingency added and rounded to nearest 100					

Table 3 gives the breakdown of costs by operation and provides a total.

Table 3: Details of costs by species for planting in 2022

Species	Name	Cost item	Cost per tree (\$)	Estimated Trees planted	Total Costs	Cost per ha
Pinus radiata	Radiata pine	Seedlings	0.60	17,600	\$ 10,560	
		Planting	0.70	17,600	\$ 12,320	
		Transport	0.03	17,600	\$ 528	
		Management	0.15	17,600	\$ 2,640	
		Release spot spray	0.35	17,600	\$ 6,160	
		Total	\$ 1.83		\$ 32,208	\$1600
Sequoia Sempervirens	Coast Redwood	Container seedlings	1.60	3,300	\$ 5,280	
		Planting	0.70	3,300	\$ 2,310	
		Transport	0.03	3,300	\$ 99	
		Management	0.15	3,300	\$ 495	
		Release spot spray	0.35	3,300	\$ 1,155	
		Total	\$ 2.83		\$ 9,339	\$2484
<b>Grand Total</b>					<b>\$ 41,547</b>	<b>\$1739</b>



## Operations

Tree stock quality, packing and handling, plus the quality of planting and grass release has a significant effect on tree survival and early growth. Fast early growth ensures trees get above frost and browse height and compete with weeds.

Planting was managed by Mark Drabble from Paengaroa. We recommend engaging an experience operator to get this important phase of forest establishment done professionally. Generally, they will organise the tree planters, transport the seedlings to the site, manage the planting quality control on site, and arrange the spot spray release contractors.

Prior to planting the owners grazed out the pasture and marked the boundary of the planting areas that are not fenced. We suggest a dazzle tree marker spray can is ideal to create dotted lines on the grass.

## 2023 Planting

On the owner's initiative, a further 2.9ha of natives and 3.8ha of Coast Redwood were established on steep areas along the eastern boundary in winter 2023.

## Total Tree areas

### Summary of all areas

Species	Area (ha)
Radiata pine	31.9
Redwood	8.6
Planted native	8.5
Existing native	18.0
Total	67.0

67.0 ha is 20% of the total farm area.

## Planting Area in Trees: Farm#1

	Effective Area (ha)	Area in Forestry (ha)	Cows wintered	Cows/ha	Total Milk solids (kg)	kg MS/cow	kg MS/ha
<b>Base</b>	308	0	802	3.0	216,950	293	704
<b>Plant Trees</b>	238	70	466	2.0	153,964	358	647

	EBITDA (\$/ha)	% Change	Total Biological GHGs (T/ha)	% Change	N Leached (kg/ha)	% Change
<b>Farm #1</b>						
<b>Base</b>	\$1,025		7.8		51	
<b>Plant Trees - dairy only</b>	\$1,979	93%	6.7	-14%	42	-18%
<b>Average across whole farm including pines</b>	\$1,622	58%	5.2	-33%	33	-35%
<b>Average across whole farm including natives</b>	\$1,359	33%	5.2	-33%	33	-35%

## Planting Area in Trees: Farm#1

	Old	New	With pines	Natives
Supplements (T DM)	618	72		
kg N/ha	137	109		
Total EBITDA	\$315,700	\$471,002	\$499,702	\$418,502



## Case Study Farm – Carbon Tax

Farm #1	Carbon Tax			
	Using Tonnes		Using Dollars	
	2025	2030	2025	2030
Base	\$10,210	\$33,153	\$10,210	\$33,153
Plant Trees - dairy only	\$6,777	\$22,005	\$6,777	\$22,005
Average across whole farm including pines	\$585	\$1,901	-\$117,057	-\$179,043
Average across whole farm including natives	\$4,742	\$15,398	-\$40,630	-\$44,069

Farm #2	Carbon Tax			
	Using Tonnes		Using Dollars	
	2025	2030	2025	2030
Base	\$4,067	\$13,207	\$4,067	\$13,207
Plant Trees - dairy only	\$2,933	\$9,522	\$2,933	\$9,522
Average across whole farm including pines	-\$1,490	-\$4,839	-\$85,521	-\$134,084
Average across whole farm including natives	\$2,754	\$4,802	-\$26,138	-\$37,674

## What do Farmers need to Think About?

### Nitrogen

1. Know your N leaching number
2. Can't apply more than an average across whole farm of 190kgN/ha – includes forage crops
3. Consider your autumn/winter grazing management
4. Know what the Regional rules are
5. All this needs to be included in your FEP

### GHGs

1. Know your GHG number and benchmark this
2. Think/plan through what options you have to mitigate &/or offset GHGs
3. Wait until we know what the farm level prices are, and what the rules are
4. Need to include GHG management in your FEP





**Summary points for the Catchment Meeting – Ian Tarbotton, Science Extension Lead**

Previously I worked at a research centre which included one of NZs longest running fertiliser trials plus some of the earliest paired catchment research in NZ.

An innovative catchment group I know of in Southland due to their Catchment analysis and mitigation rankings formed a legal entity. This farmer group then leased land from a farmer lower in the catchment so a wetland there could be greatly expanded as that was the fastest and most cost effective mitigation. Novel but effective solution.

**Key dimensions that contribute to great fertiliser management:**

<p><b>Principles</b> Evidence based decision making (science underpinned mgmt. and product selection) Steps ideally: Test – Diagnose - Recommend</p>	<p><b>Process</b> Understand your catchment Get advice on water sampling as flow rates and sampling greatly affect results Ideally agree what parameter is priority Utilise Catchment modelling re: mitigation</p>
<p><b>Product</b> Consider 2<sup>nd</sup> generation fertiliser products that align with farm and catchment goals. An example is SurePhos a slower release Phosphate which is a good example to reduce P loss to waterways.</p>	<p><b>Placement (Two key ones)</b> Within farm Blocks should be chosen that reflect scale of mgmt. and differences. Effluent areas are usually one on a dairy farm.  With paddocks consider avoiding near gateways and around troughs. Also along raceways or lanes.  Spreaders whether from ground or air should be professional, qualified and calibrated.</p>

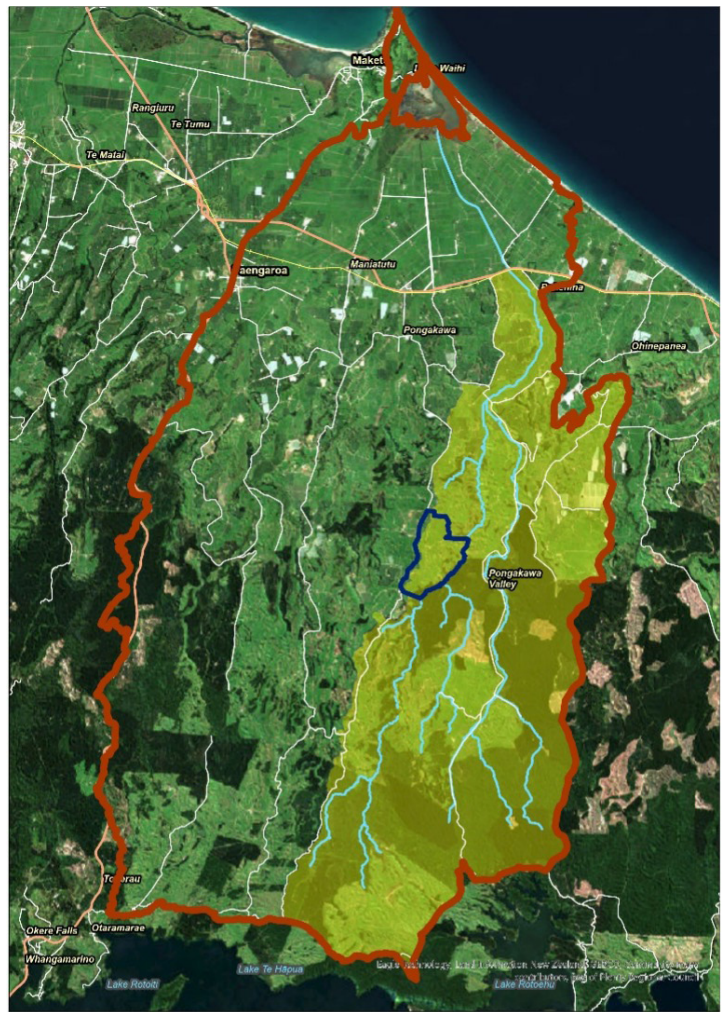
**Examples of Ballance’s Innovation s**

**Four products / services:**



## BOPRC Presentation, Farm Forestry Field Day, Ao Marama Farms 2023

- The Ao Marama Farm is located in the Pongakawa Sub-Catchment of the 35,000-hectare Waihi Estuary Catchment. This area forms one Freshwater Management Unit (FMU) under BOPRC's draft options to address the NPSFM's requirements.
- Waihi Estuary ecosystem health is in a poor state and declining state. Nutrients have caused algal blooms and there is a lot of soft sediment in the estuary. Seagrass cover in the estuary has reduced significantly over time. Sediment, phosphorus, and nitrogen loads from the catchment are the key cause of this.
- A large amount of work is underway in the catchment to improve the state of the estuary. Significant contaminant reductions will be achieved by these programmes, and national regulations, including Freshwater Farm Plan requirements. However, additional regional rules will also be required to achieve the large load reductions needed. It is considered likely that, over the long term, some land use change will be necessary.
- Estuary values and outcomes will drive the need for substantial change within this FMU to reduce the four key contaminants: in the order of 70% for nitrogen, 30% for phosphorus, 25%- 50% for E. coli, and 20%-65% for suspended sediment.
- A large amount of work is underway in the catchment to improve the state of the estuary. Significant contaminant reductions will be achieved by these programmes, and national regulations, including Freshwater Farm Plan requirements. However, additional regional rules will also be required to achieve the large load reductions needed. It is considered likely that, over the long term, some land use change will be necessary.
- Options we are exploring for this FMU could include:
  - » Achieving a large reduction in Nitrogen, Phosphorus, Sediment and E. coli from the catchment over time. 40 years is suggested with 10 yearly interim targets to measure progress along the way.
  - » Controlling grazing of steep (>25 degrees) erosion prone land – either no stock or stock size constraints.
- More info can be found at: <https://www.participate.boprc.govt.nz/Essential-Freshwater/draft-waihi-estuary-freshwater-management-unit-fmu>





## Wai -Kokopu Catchment Group 2021-2024

The Incorporated Society was initiated by Andre Hickson, who pulled together a group of like-minded farmers to act on improving the Little Waihi Estuary and the 34500 ha catchment that feeds it.

The Society raised \$7.5 Million of funding from MPI, MFE, Bay Trust and TECT to develop climate resilient solutions for the catchment, and initiate carbon farming, and look at lower footprint farming systems. \$3.2 Million raised by the society in 2021 from MFE was donated to the iwi collective Te Wahapu o Waihi.

The Wai Kokopu Society(catchment group) is in the final year of this original funding, and is working with landowners that are keen to continue to reduce their footprint ahead of local regulation. If you are a landowner looking to retire land, please get in touch with Stef Kincheff, John Burke or Guy Wilkins.

Achievements of the Society since 2021 include

- Work with 15 landowners(3 seasons) to develop lower footprint farming systems – Lighthouse farms and socialized their stories of change.
- Continued to raise awareness on lower footprint, more profitable systems.
- >50 farm plans on properties, looking at Nutrient, Sediment and E Coli reduction.
- Farm Team have completed/funded >60 Overseer files to track net reductions of nutrient loss from farmers making change like the Nettleinghams.
- Developed a pan sector digital farm plan and digital tools & won national awards.
- Held numerous events raising awareness with over 1000 attendees
- Retired and Restored 210 Ha of steep/vulnerable land to native and exotic planting.
- Looking for another 40-50 Ha to retire this year.
- Planted 200,000 trees and aiming to plant a further 100,000 trees this year(2024).
- Provided fully funded Effluent Warrant of Fitness Reviews
- Working closely with Pongakawa School to provide nature-based education
- Working closely with Fonterra and dairy farms to help understand how to reduce emissions
- Numerous fielddays with Zespri to raise awareness on Low N systems
- Water Testing - >60 rural drinking water samples
- 1200 water tests on distal rivers, shellfish and estuary monitoring E Coli
- Fish Passage Remediation project – mid to upper catchment.
- Undertaking a full catchment planning model to work out lowest cost remediation for water quality improvement
- The restoration team developed a nationally significant film on lower cost native restoration – Timata Method.

<https://ourlandandwater.nz/outputs/the-timata-method-a-low-cost-way-to-retire-farmland-into-native-forest/>



# Lower Cost Native Restoration of Farmland

## Timata Method Fact Sheet

OUR LAND  
AND WATER

Toitū te Whenua,  
Toiora te Wai

National  
**SCIENCE**  
Challenges

tipu



whenua



# Timata Method – Lower Cost Planting Method

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The Timata Method, which in Māori translates to begin, start, kick-off or commence, initiates the natural processes commonly seen by the appearance of seedling mānuka or kānuka that farmers classically have called scrub, which in time (50–100+ years) is known to evolve into fully restored ngahere (native forest). The fundamental principles of the Timata Method are use of easily propagated and planted nursery crop species, cultivation of plants in small-size (approx. 120ml) root trainers known as “forestry-grade” and fewer trees per hectare than conventional guidelines. Deployed as a whole, the Timata Method lowers the cost of planting and makes more efficient use of time and labour resources.

*The Timata method is particularly suitable for broadscale retirement of steep pastoral land but also riparian and wetland margins using professional forestry preparation and planting methods.*

It may be advisable to use higher-grade plants on more challenging sites such as cut-over pine and kikuyu pasture.

## Species Mix

The type of nursery crop species should reflect not only what is common for the location but also where plants are likely to perform best according to the topography of the site.

A typical Timata planting mix for a dry site might be 50% kānuka, 20% mānuka and 30% bird-loving species, whereas cooler and/or wetter sites would change to around 50% mānuka and 20% kānuka. Up to 100% mānuka or kānuka should be considered on sites where there is a high risk of browsing damage to the more palatable leafy plants listed below, which could be introduced in small groves later.

Bird-loving coloniser plants will vary according to the site but are likely to include species such as karamu, mahoe, makomako, whauwhaupaku, tarata, kohuhu, koromiko, ti kouka and harakeke. Strategic planting of tree lucerne (tagasaste) could also be considered.

*Eco-sourcing of plant seed is encouraged to maintain local flora characteristics and assist plant establishment and performance.*



## Plant Spacing

The Timata Method recommends that plants are set no closer than 2m x 2m apart (2,500 stems per ha). Whilst 2m spacings are recommended on most sites, 3m spacings could be contemplated on fertile, easy contour sites which may adjoin a critical source area or wetland. Well-managed planting at these densities can be expected to achieve canopy closure within 4–8 years of planting.

## Typical Forestry Grade Plant Specifications

- Minimum above ground seedling height of 30cm
- Root collar diameter of 3mm
- Seedlings grown in Lannen 64FD container trays or equivalent
- Root density such that plugs hold together during lifting, transport and handling for planting
- Seedlings packed and delivered in corrugated cardboard or returnable plastic boxes at 75–100 seedlings per carton
- Experienced planters are able to plant up to 1,000 stems per day

## Weed and Animal Pest Control

Specific details on different weeds and animal pests and their treatment is a specialized area that requires professional advice and assistance.

Comprehensive weed and pest control measures should be undertaken over the site and peripheral areas *prior to planting* – weed and animal pest control treatment may be required for up to 2 years before planting. This, along with ongoing weed & pest management should apply *irrespective of the planting regime*.

Control of browsing animal pests such as deer, goats, wallabies, hares, and rabbits should ideally be carried out by professional hunters. Regular surveillance is also required to identify potential recursion as even one or two deer can cause significant damage to young plants in a short space of time. Landowners should consider plant guards or spray-on repellants at planting in high-risk pest areas.

## Introduction of Succession Trees

It is possible that the planting of a well-managed nursery crop using the Tīmata method will eventually lead to the establishment of mature ngahere without the need for planting of broadleaf, podocarp and conifer tree succession trees; particularly if it is adjoining or near an existing native forest which can provide the seed source for dispersal. Species such as puriri, kohekohe, totara and ferns can spread from quite some distance, however others such as kauri, beech and kowhai require a close seed source.

It is recommended that introduction of succession broadleaf, podocarp and conifer trees is deferred until the nursery crop is well established (3–5 years+) and they are planted in strategic groves (at 100 to 200 trees per hectare). Delay of their planting which will encourage good tree form and provide shelter and friendly fungi for the taller trees (rakau) to thrive.

## Planning & Process Guidelines

Calendar Years >>>>>>>	Year 1				Year 2				Year 3				Year 4				Year 5+			
Action	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Initial Planning & Advice	█	█																		
Organising funding		█																		
Weed control		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Animal pest control		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Ordering of plants		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Arranging contractors		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Fencing & earthworks including tracking		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Pre-plant spot spray		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Planting		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Release		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Blanking		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Succession Tree Planting		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Weed Monitoring		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Animal Pest Monitoring		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

<b>Comparative Native Planting Costs (2022 pricing)</b>				
		<b>Timata</b>	<b>Timata</b>	<b>High Density</b>
		<b>Forestry Grade 3m</b>	<b>Forestry Grade 2m</b>	<b>PB3</b>
<b>Plant Spacing:</b>				
- Metres Between Plants		3.0	2.0	1.5
- Metres Between Rows		3.0	2.0	1.5
Plants per ha		1,111	2,500	4,444
Blanking %		15%	10%	0%
Blanking Plants		167	250	-
<b>Total Plants</b>		<b>1,278</b>	<b>2,750</b>	<b>4,444</b>
<b>Planting Cost Metrics</b>				
Preplant Spot Spray*	\$ Per plant	\$ 0.50	\$ 0.50	\$ 0.50
Plant	\$ Per plant	\$ 1.40	\$ 1.40	\$ 3.80
Planting	\$ Per plant	\$ 1.30	\$ 1.30	\$ 2.50
<b>Total</b>	<b>\$ Per plant</b>	<b>\$ 3.20</b>	<b>\$ 3.20</b>	<b>\$ 6.80</b>
<b>Total Planting Cost per Hectare</b>		<b>\$ 4,089</b>	<b>\$ 8,800</b>	<b>\$ 30,222</b>
<b>Release</b>	\$ Per plant	\$ 0.50	\$ 0.50	\$ 0.50
	Cost per ha	\$ 639	\$ 1,375	\$ 2,222
<b>Succession Trees</b>	Trees per ha	150	150	150
** Including Planting Labour	\$ Per Tree**	\$ 10.00	\$ 10.00	\$ 10.00
	Cost per ha	\$ 1,500	\$ 1,500	\$ 1,500
<b>Estimated:</b>				
<b>Weed Control</b>	Cost per ha	\$ 1,500	\$ 1,000	\$ 500
<b>Animal Pest Control</b>	Cost per ha	\$ 1,000	\$ 1,000	\$ 1,000
<b>Fencing</b>	Cost per ha	\$ 2,000	\$ 2,000	\$ 2,000
<b>Earthworks</b>		\$ 500	\$ 500	\$ 500
<b>TOTAL COST PER HECTARE</b>		<b>\$ 11,228</b>	<b>\$ 16,175</b>	<b>\$ 37,944</b>
* Ground based (Helicopter desiccation another option)				

For more information please go to the full report, and video here:

<https://ourlandandwater.nz/news/the-timata-method-for-low-cost-native-forest/>





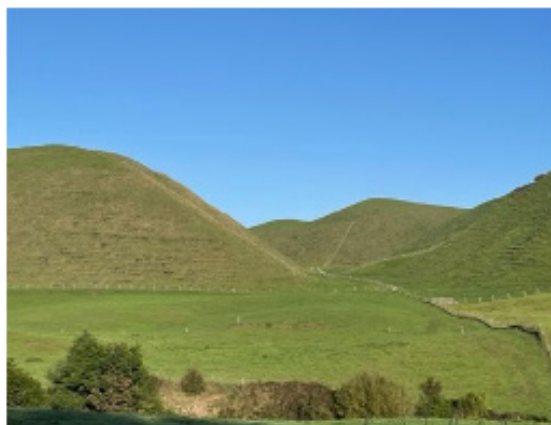




## RE-LANDSCAPING YOUR FARM

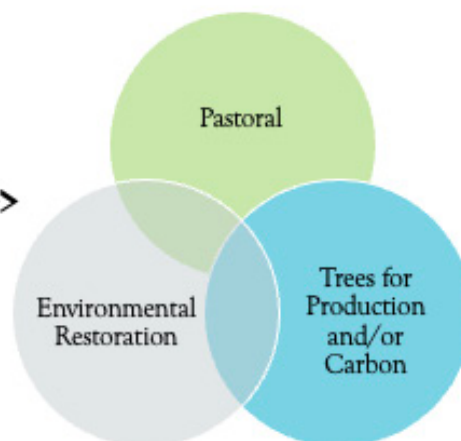
Freshwater & Forestry Field Day

### Changing the lens in the way we look at land use



Pastoral Farming (EGA)

Redesign >>



>>>>>>>

Integrated Land Use

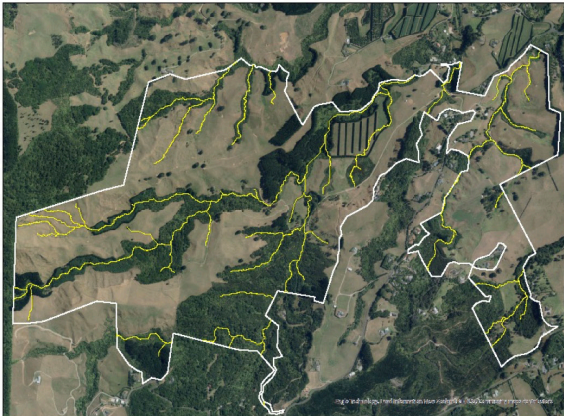
### Farmers Require a Support from a Multi-skilled Advisory/Coaching Team that can provide ....

- Farm system analysis and change management advice to reduce environmental footprint >> farming to the grass curve
- Livestock Management > reduced stock being farmed to genetic potential
- Nutrient budgeting and modelling (Overseer, Farmax, Dairybase)
- Soil health management (Organic Matter, HW Extractable Carbon, Total P)
- Highest and best environmental/economic land use assessment
- Native and Exotic Forestry and Carbon (ETS)
- LEP assessment, planning and Implementation

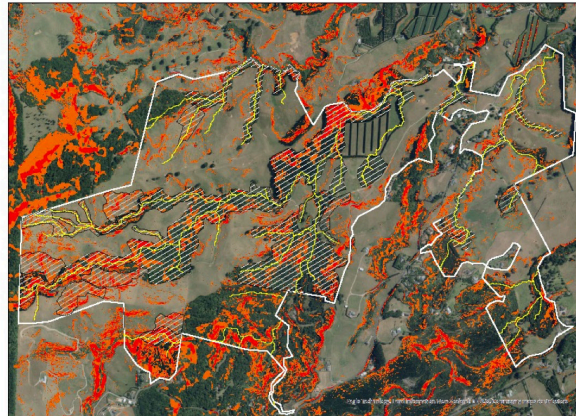
- Organic farming
- Ecological Restoration
- **People Management**

**Farmers Require a Support from a Multi-skilled Advisory/Coaching Team that can provide ....**

**Water Overland Flowpaths & CSA**



**Steep Erosion Prone Slopes**



**Production vs profit \$\$\$**

<b>B&amp;L Economic Survey - Apportionment to LUC</b>			
	<b>TOTAL HA</b>	<b>Balance</b>	<b>LUC 6-7</b>
Area Hectares	<b>1,000</b>	670	330
% Apportionment	100%	67%	33%
Drymatter Production per Ha	<b>6,010</b>	7,000	4,000
Drymatter Requirement per SU	<b>788</b>	<b>773</b>	<b>845</b>
SU/Ha	<b>7.63</b>	9.06	4.73
Stock Units	<b>7,629</b>	6,067	1,562
<b><u>FINANCIAL PERFORMANCE</u></b>			
Revenue per Stock Unit**	\$ 116	<b>\$ 116</b>	<b>\$ 116</b>
<b><u>Expenditure</u></b>			
Fixed Per Stock Unit**	\$ 36	<b>\$ 36</b>	<b>\$ 36</b>
Fixed Per Hectare**	\$ 299	<b>\$ 299</b>	<b>\$ 299</b>
<b>REVENUE</b>	<b>\$ 885,010</b>	<b>\$ 703,803</b>	<b>\$ 181,207</b>
<b><u>EXPENSES</u></b>			
Fixed Per Stock Unit**	\$ 274,658	\$ 218,422	\$ 56,237
Fixed Per Hectare**	\$ 299,000	\$ 200,330	\$ 98,670
<b>Total Expenses</b>	<b>\$ 573,658</b>	<b>\$ 418,752</b>	<b>\$ 154,907</b>
<b>DRYSTOCK GROSS MARGIN PER HA</b>	<b>\$ 311,352</b>	<b>\$ 285,052</b>	<b>\$ 26,300</b>
	<b>\$ 311</b>	<b>\$ 425</b>	<b>\$ 80</b>

\*\* B&LNZ 22/23 Economic Survey Class 3 - NI Hard Hill



## First Step: Ecological Restoration Land Retirement

Identify native planting retirement areas to restore:

- Stream health
- Wildlife habitat (birds, invertebrates, fish)
- Consider:
  - Riparian margins
  - Micro-wetlands
  - Wildlife corridors
  - Shade & Shelter for Livestock



Seek specialist advice from Regional Council, Catchment Groups, fellow Farmers, conservation services

## Pastoral vs Commercial Tree Crop Considerations

Multi-discipline Pastoral and Forestry advice required to evaluate:

- Erosion risk (LUC and Soil type)
- Pastoral enterprise functionality - LMU
- Retirement options – Native, Exotics (Production and/or Carbon), Manuka, Eco-tourism
- Integrated Land Use design – Aesthetic Value
- Phased development – start small
- Economics & financing



## Final Observations

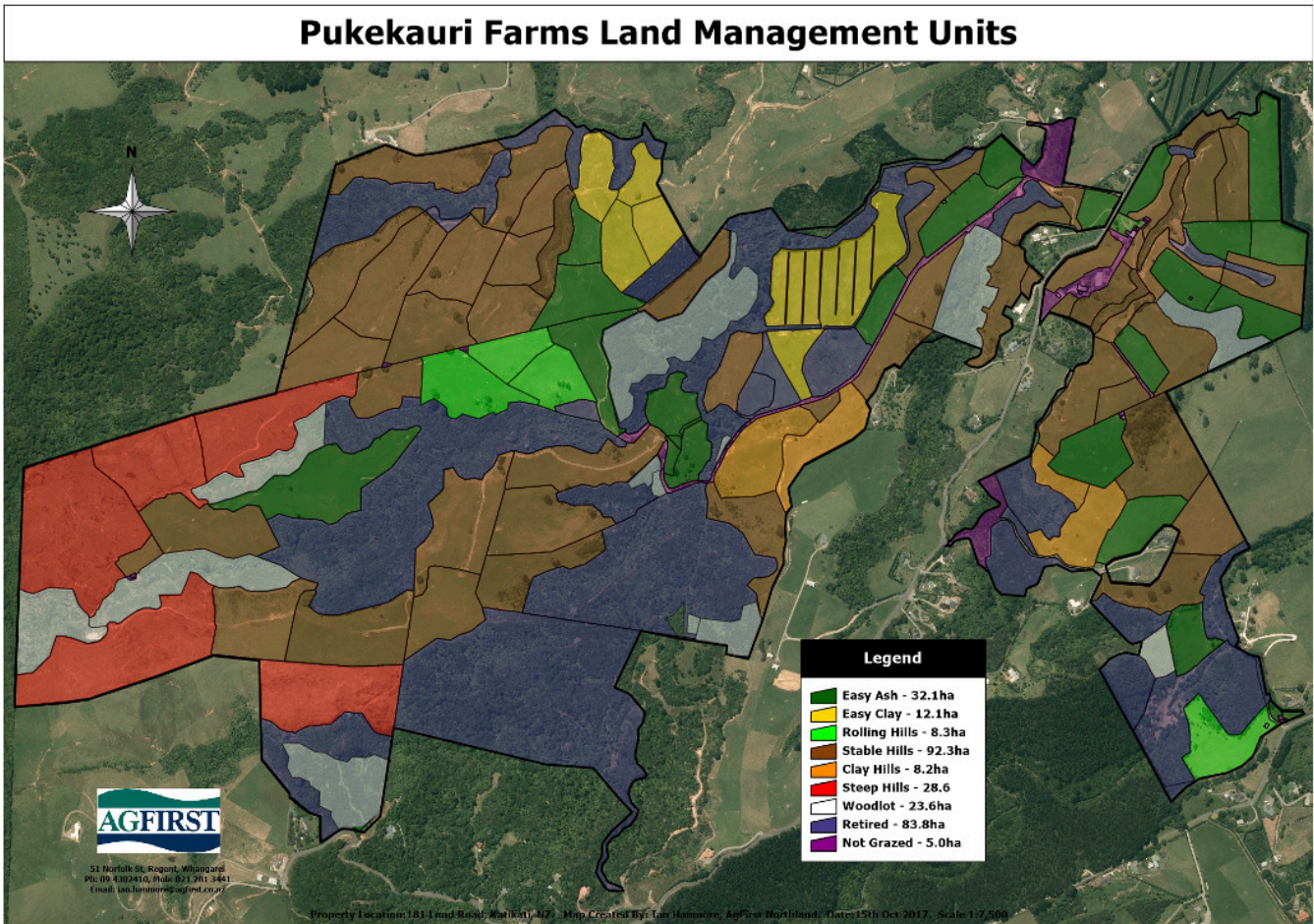
- LEP and land use change may appear to be challenging .....BUT
- The reality is more straightforward and a lot of the decisions are simply common sense
- We just have to start looking at our landscapes through a different lens
- Start small and build momentum
- We should treat the challenges we face as an opportunity to redesign pastoral farming to an integrated land use which ticks the boxes for:
  - Environmental sustainability
  - Business viability
  - Farmer and community well being

The results will be highly rewarding!!

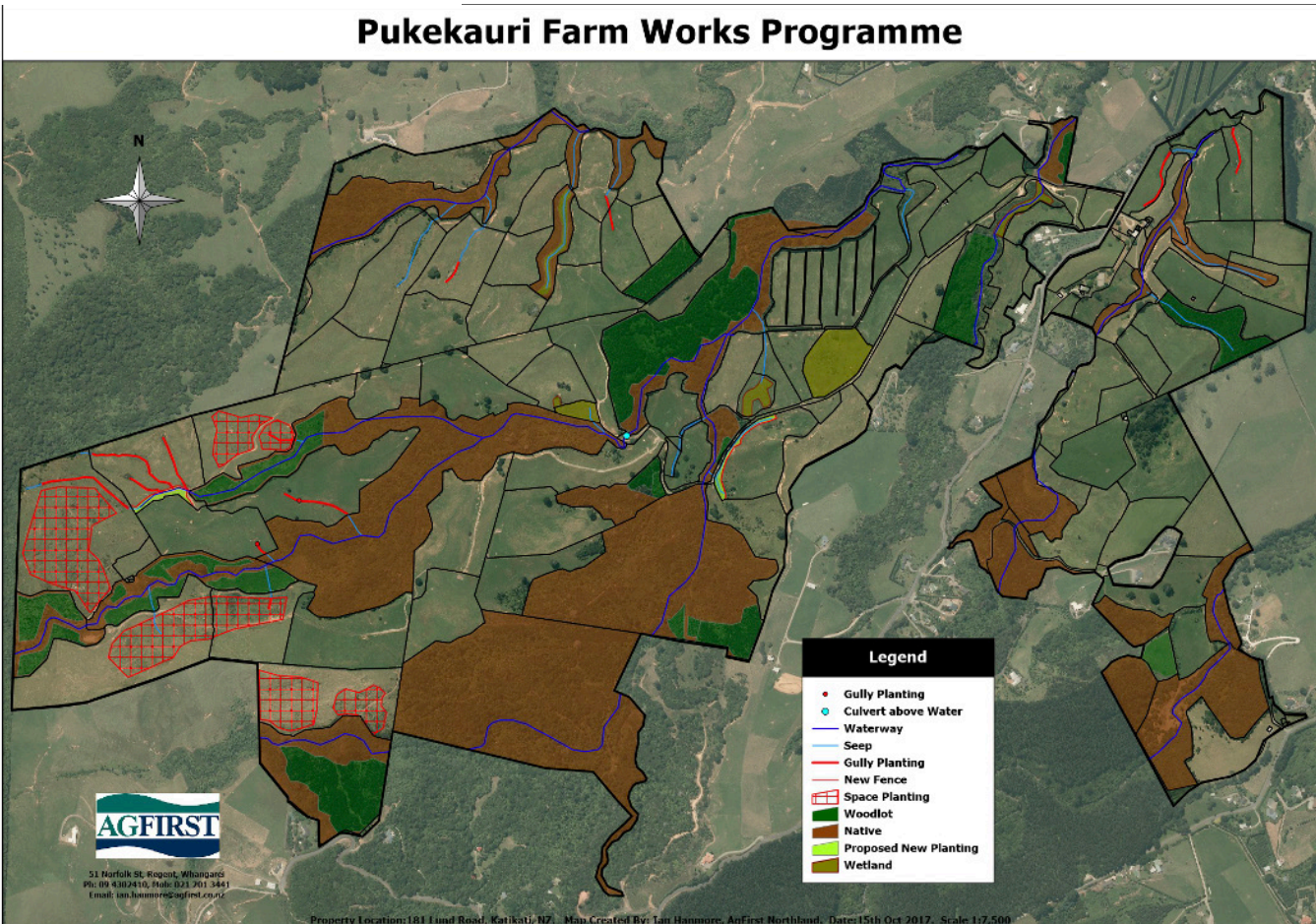


# Develop Your Plan

## Land Management Units



## Right Tree Right Place







**Think different.  
Grow veal.  
Join Pearl Veal.**

Pearl Veal is a producer of milk and pasture-raised veal. We're creating an opportunity for dairy x beef calves by producing tender, lean and delicious veal from vealers up to 12 months of age! Pearl Veal calves are fed only colostrum, fresh whole milk, and pasture. This is simply what nature intended. Pearl Veal is one of life's true luxuries. And fittingly, it is being showcased by leading chefs across New Zealand.

### **Dairy Farmer**

- Calves born on a dairy farm must receive gold colostrum, and fed only fresh whole milk, hay, and pasture through to weaning at 100kg plus.
- No calf meal/grain/PKE. No antibiotics or red milk.
- Heifers and steers.
- Dairy farmers can finish calves themselves (contracted to Pearl Veal) or they can be sold via Pearl Veal to a finishing farmer at a price reflecting the effort and cost involved.

### **Finisher**

- Purchases the calves from dairy farmers through Pearl Veal
- Finished on pasture/forage up to 12 months of age.
- 135-155kg carcass weight (260-320kg liveweight), earning a premium over schedule.

### **Farm System Benefits**

- High feed conversion efficiency with younger animals.
- A one-year system – no second winter, and some no first winter!
- Lighter cattle, so easier on the soil and pasture - less pugging and compaction.
- Pearl Veal is a very GHG emissions efficient pastoral-based meat production system.

**Come and join us as we Grow Pearls from Pasture.** We're small (for now!) We're nimble. And we want this to work for farmers and chefs. To discuss rearing or finishing veal contact:

Alan McDermott ph: 0274 778236 e: [alan@pearlpastures.com](mailto:alan@pearlpastures.com), Instagram: @pearlvealnz/



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