

# REGIONAL CONTEXT 1:60000



## CONTEXT

Animal agriculture uses 83% of the world's agricultural land to produce only 18% of the calories, making it the one of the most destructive yet easily addressed environmental issues we face. With the global population growing by 80 million each year, forests are being cleared at an unprecedented rate to grow animal feed, accelerating global warming and decimating already stressed ecosystems. This pattern is mirrored locally, with less than one percent of the Canterbury Plains' indigenous vegetation cover now remaining. Intensive dairy farming over the past two decades has led to severe water quality issues, with Canterbury now recording some of the highest per-capita levels of gastrointestinal illness in the developed world. Making headlines recently is the link between nitrates in drinking water and bowel cancer incidence, a significant concern in dairy farming regions. In spite of Environment Canterbury recently declaring a climate emergency, there is little urgent action being prescribed, leaving meaningful change to largely individual efforts. However major disruptions are just over the horizon. Rethink X, a group of scientists lead by Tony Seba of Stanford University predicts that by 2030, ten years from now, modern PF food products (plant-based precision fermentation) will replace animal derived foods and the American dairy and beef industries will collapse (Seba, T., Tubbs, C., 2019). Now is the time to withdraw from animal agriculture, restore health to ecosystems and take the opportunity to be a leader in farming for the future.

## ISSUES

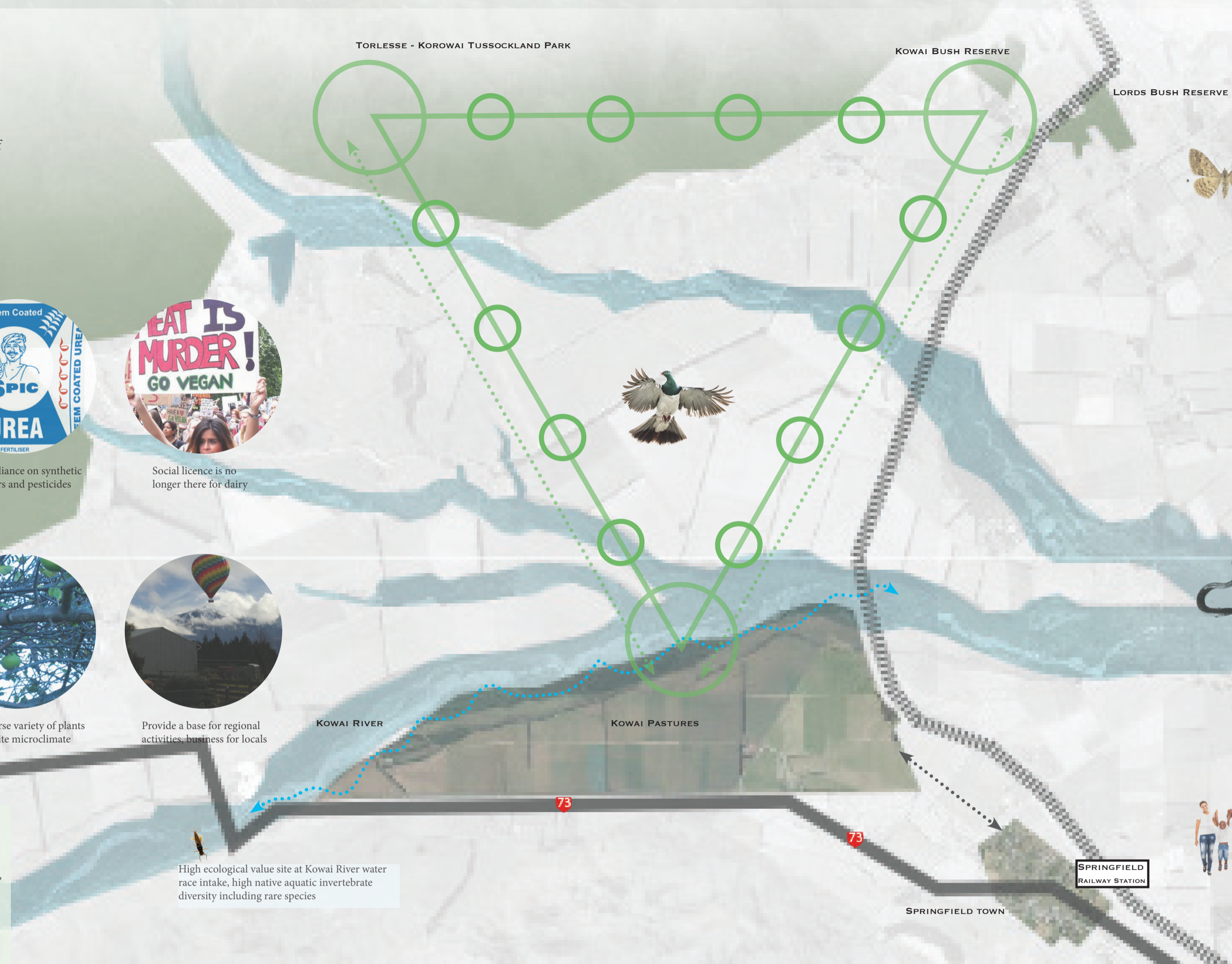
- Animal welfare, climate change, industry facing major disruption
- Stressful and unhealthy work environment
- Monocultural farming system, low biodiversity
- Water over-abstracted, polluted by nutrient run-off
- Over-reliance on synthetic fertilizers and pesticides
- Social licence is no longer there for dairy

## OPPORTUNITIES

- Supply green, emerging markets (hempcrete, marijuana, plant protein)
- Restoration planting for carbon credits (sequester) and ecosystem
- Relink to Springfield's history as health retreat from the city
- Connect people through work, trade, recreation and education
- Grow diverse variety of plants based on site microclimate
- Provide a base for regional activities, business for locals

## VISION

At the site formerly known as Kowai Pastures, the plain's gridded mosaic of rectangular paddocks dissolves and blurs as nature worms its way back in. For more than a century Papatuanuku's self-expression has been suppressed by the unbending rigid lines of industrial farming, but with the pressure lifting, she can rise once again and a healing can begin. The cows are gone, but stand still, and you can hear life at work, scratching and rustling, chirping and fluttering, indigenous critters doing their business. As a farmscape, Kowai Pastures has become less orderly as landuse has been linked to soil characteristics and microclimatic conditions, rather than a grid. Accommodation sites overlook the river with expansive views into the mountains, yet are invisible from the road, nestled in native bush patches. The old dairy shed and elevated yards with stunning mountain views are now used for hemp processing into fibre, which is bagged, ready to mix with lime to make hempcrete. Staff are bright and enthusiastic, proud to work in a business that is enhancing environmental and community health. Kowai Pastures is now known as Kowai Kaimanga (Maori word for vegan). Health is being restored to the land and adjacent waterway by large-scale restoration planting. Health is being restored to people by provisioning of healthy food, meaningful, well-paid employment and ecosystem services. We have transitioned from problem to solution.



## STRATEGIES

**ECOSYSTEM/ BIODIVERSITY/ CARBON CREDITS**

Foothills indigenous plant community dryland patches and corridors will be established over 100ha including the 40ha of DOC leasehold land. The distance from site to Lords and Kowai Bush Reserves is 6km and 5km to Torlesse Korowai. With small vegetation patches on private land as stepping stone patches and corridors along riverbeds, the site's large patch will function as a core sanctuary as described in Colin Meurk's idealised nested forest patch configuration (see diagram). Quality habitat will be available for most plants, lizards, insectivorous birds and invertebrates. This configuration will also support metapopulations of frugivorous birds and flying insects and allow gene flow between populations (Meurk, C. D., & Hall, G. M. 2006). The presence of a core sanctuary so close to Springfield will enhance biodiversity in town gardens and green patches while displaying kaitiakitanga of land. Planting will be connected to the carbon credit scheme so it can earn income for the farm while providing ecosystem services. Although native forests sequester carbon at lower rates than *Pinus radiata*, they are longer

### WATER

Wetland species will be planted over 5ha of low lying floodplains, and around natural springs and ephemeral waterways at higher elevations. On the riverbed, plantings will replace scrub, mainly *Salix*, gorse and broom, cooling water temperatures by shading and improving quality of riparian habitat for fish, tuna and invertebrates, there being several high biodiversity sites adjacent to farm (James, A., 2011). They also filter sediment, and absorb nutrient and chemical contaminants. Water abstraction from surface water (river) will be phased out to reduce negatively impacting river flow volumes. Water use will be reduced by less intensive farming methods and use of hardier productive plant species. Rainwater will be harvested from all roofs and water will be pumped from existing bores if required.

### HUMAN CONNECTIONS

The new functions on site will build on the strong gray network connection through State Highway 73 and the Midland Railway to reduce isolation from community and result in increased human connections.

The site will provide employment opportunities to Springfield locals, fruit, vegetable and marijuana horticulture being more labour intensive than dairy farming. Whanaungatanga will be displayed by providing a living wage and a caring, flexible work environment focused on wellness and success in all aspects of life. The cafe, native plant nursery and farmshop will attract visitors, as will the accommodation. The Kowai River Greenstone trail will encourage connection to neighbouring land owner who may wish to continue the track through their properties. The farm will become a specialist supplier of co-sourced Canterbury foothills plant community species and be a supplier and exemplar to farms in the area.

The farm will display manakitanga through provision of recreational space as native plantings and mahinga kai sites establish. The site will also host green composting facilities, community planting days, environmental and horticultural seminars, cross-country races for the local primary school, occasional fetes and annual dance festivals.

## THE SUMS

PRODUCT	ANNUAL YIELD KG/HA	PRODUCTION COST \$/KG	INCOME \$/KG	INCOME \$/HA	PROFIT \$/HA
GLASSHOUSE MARIJUANA COLAS	1000	200	2,000 (current low-end price in Colorado)	2,000,000	1,800,000
OUTDOOR MARIJUANA COLAS	500	40-400	2,000	1,000,000	800,000 @ \$400/Kg production cost
MILK SOLIDS	1000-1500	5	6	6,000-9,000	1,000-1,500 @ \$6/Kg MS payout

Pre-Kai Tahu, Waitaha lore describes Kowai Bush as being full of kereru, kaka and weka.

In pre-European times the Kowai River formed part of the Pounamu Trails, used to carry pounamu from the West Coast to Canterbury.

In 1849 surveyor Charles Torlesse, led by Maori guides made a track over Porter's Pass.

Springfield Hotel (est. 1862) had to expand several times as Springfield's reputation as a health resort grew.

The Midland Railway reached Springfield in 1880, Arthur's Pass in 1914, and the West Coast in 1923.

Plant-based farming, carbon credits, marijuana/ hemp products

Severe weather events, biodiversity restoration

1800: Podocarp-Beech forest pre human settlement

1850: Fire damage due to Maori burn-offs

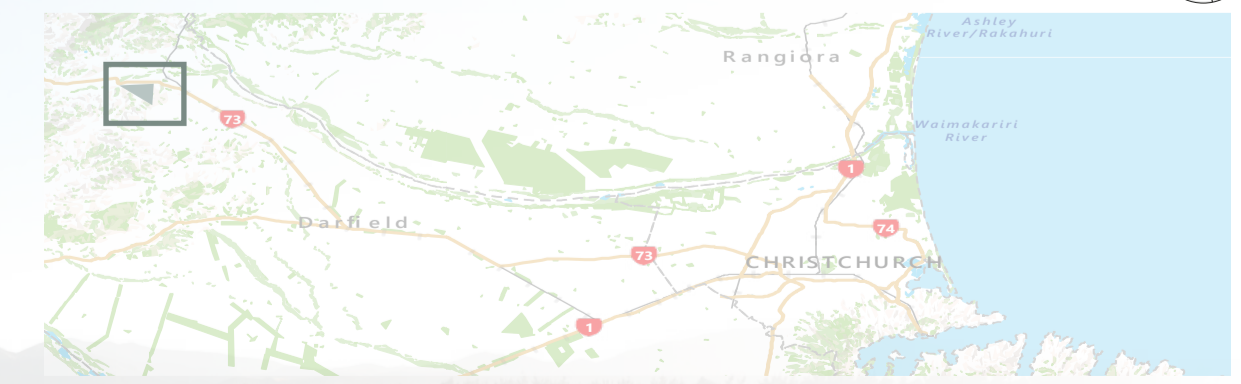
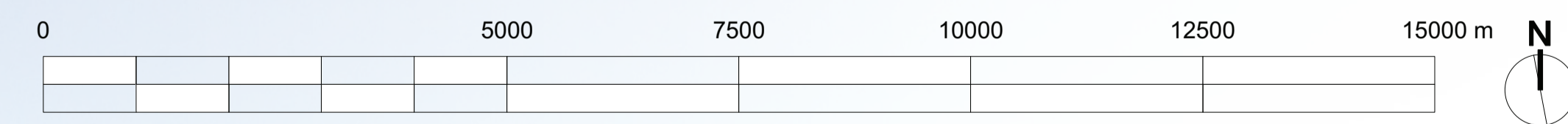
1860: Kowai Pastures sheep run established in 1860.

1950: Monocultural pasture with pine hedgerows dominates

2000: In 2001 Kowai Pastures converted to dairy.

2050: Severe weather events, biodiversity restoration

## KAIMANGA KOWAI DE-STRESS + RE-DRESS



# MASTERPLAN 1:3000



## GOALS AND OBJECTIVES

### Create a sustainable way forward for Kowai Pastures.

- Increase biodiversity, both on productive land and margins.
  - Establish large patches of indigenous plant community on DOC land (river terraces).
  - Plant wetland plants around ponds, waterways and springs.
  - Plant a wider range of crops and expand shelterbelts to include productive trees.
  - Keep scattered pockets of land for experimental planting of productive species.

### 2. Reduce reliance on external inputs and resources (feed, water, chemical sprays, fertilizer, fuel, electricity).

- Reduce water abstraction from Kowai River with goal of not replacing pivot irrigators after serviceable life.
- Select plant species that are well adapted to conditions and require less inputs to thrive.

### 3. Diversify income stream from agriculture only.

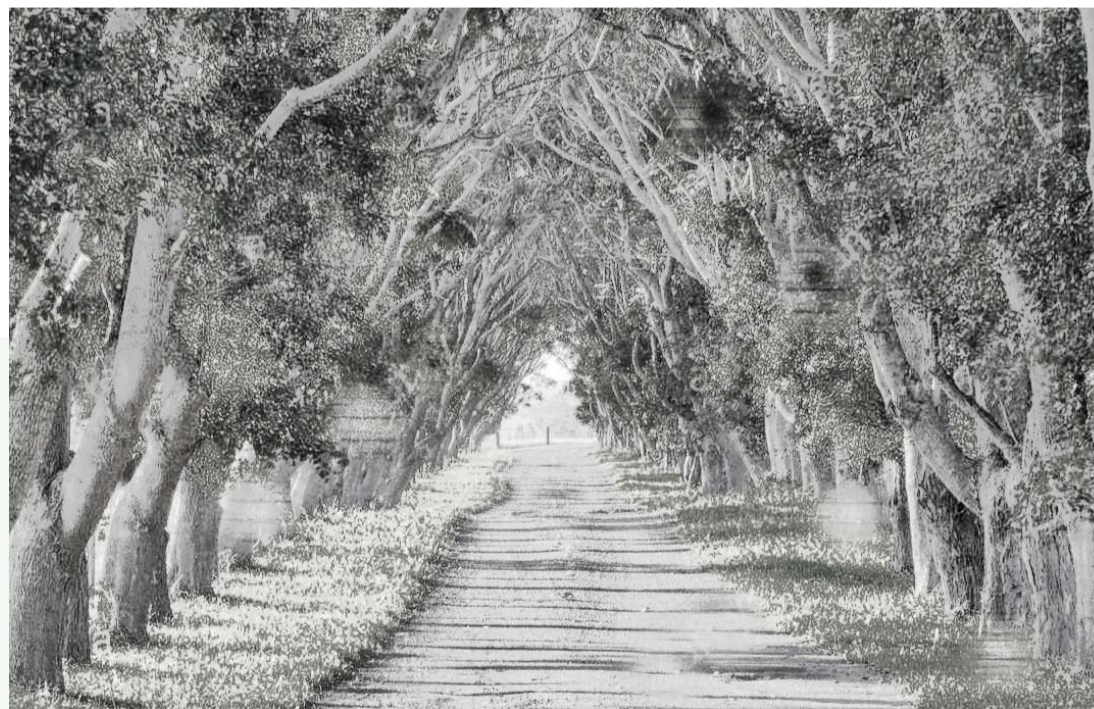
- Establish site as a healthy getaway/ retreat with restaurant, dispensary and accommodation.
- Promote farm as base for further regional activities/ exploration.

### Regain public approval and restore social licence to operate.

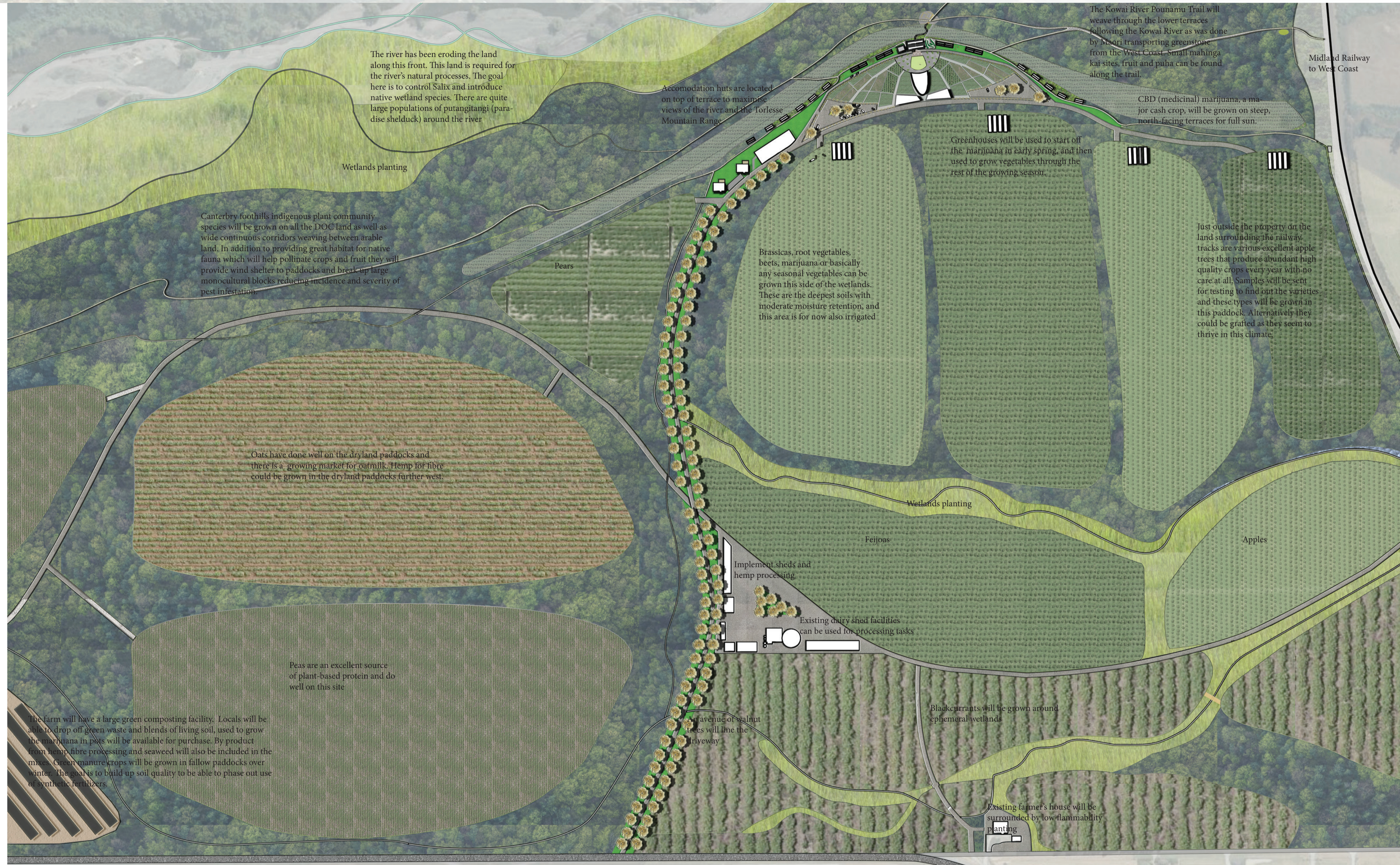
- Demonstrate commitment to care for the environment.
  - Protect and enhance waterways.
  - Plant large patches of indigenous plant community on DOC and marginal land.

### 2. Demonstrate community engagement and support.

- Create a private-public track on river terraces and work with neighbouring landowners to extend.
- Create more jobs for locals through diversifying farm activities.
- Provide community ecosystem services by enhancing green infrastructure and biodiversity.



Walnut avenue on driveway coming onto site off State Highway 73.



The river has been eroding the land along this front. This land is required for the river's natural processes. The goal here is to control Salix and introduce native wetland species. There are quite large populations of putangitangi (paradise shelduck) around the river

Accommodation huts are located on top of terrace to maximise views of the river and the Torlesse Mountain Range

The Kowai River Pounamu Trail will weave through the lower terraces following the Kowai River as was done by Moeri transporting greenstone from the West Coast. Small mahinga kai sites, fruit and puha can be found along the trail.

CBD (medicinal) marijuana, a major cash crop, will be grown on steep, north-facing terraces for full sun.

Greenhouses will be used to start off the marijuana in early spring, and then used to grow vegetables through the rest of the growing season.

Just outside the property on the land surrounding the railway tracks are various excellent apple trees that produce abundant high quality crops every year with no care at all. Samples will be sent for testing to find out the varieties and these types will be grown in this paddock. Alternatively they could be grafted as they seem to thrive in this climate.

Brassicas, root vegetables, beets, marijuana or basically any seasonal vegetables can be grown this side of the wetlands. These are the deepest soils with moderate moisture retention, and this area is for now also irrigated

Canterbury foothills indigenous plant community species will be grown on all the DOC land as well as wide continuous corridors weaving between arable land. In addition to providing great habitat for native fauna which will help pollinate crops and fruit they will provide wind shelter to paddocks and break up large monocultural blocks reducing incidence and severity of pest infestation.

Oats have done well on the dryland paddocks and there is a growing market for oatmilk. Hemp for fibre could be grown in the dryland paddocks further west.

Peas are an excellent source of plant-based protein and do well on this site

The farm will have a large green composting facility. Locals will be able to drop off green waste and blends of living soil, used to grow the marijuana in pots will be available for purchase. By product from hemp fibre processing and seaweed will also be included in the mixes. Green manure crops will be grown in fallow paddocks over winter. The goal is to build up soil quality to be able to phase out use of synthetic fertilizers.

## KAIMANGA KOWAI DE-STRESS + RE-DRESS



# INTERMEDIATE PLAN 1:500



Pepe (moth) was gliding along in a breeze when it suddenly calmed and she drifted gently down to the ground. She could hear a faint trickle of water, and looking down from the terrace top could see silver braids of the Kowai River, gently weaving through the valley below. She could see the peaks of the Torlesse Ranges across the river, jutting through the clouds. This place felt familiar. She had been here before. Yet looking around, it was different. Where once Papatuanuku had been clothed in the resplendent forests of Tane, she now seemed naked, covered in a thin veil of pale green grass. It sounded different too, the absence of birdsong very noticeable. However despite the change, it was still a beautiful spot. She was glad the wind had brought her down here and decided to have a sleep. She dreamt that Tane rewove Papatuanuku's beautiful green cloak, in all hues of green. She dreamt of tamariki splashing in the river while adults gathered kai. She dreamt of flocks of kereru clumsily crashing through the canopy. She dreamt.

Ngai Tahu called big native moths "takata wairua", a name referring to their capturing departed souls (ancestors) and the sound their fluttering wings make.

Aotearoa has more than 2000 moth species, 90 percent of them endemic. Despite their low profile, they are at the centre of the food web, both as consumers and food for those further up the chain. Pepe play an extremely important role as pollinators, not just of native plants for which they are specialists, but a multitude of plant species that require insect pollinators.

Pepe's form and markings were used as design inspiration for the heritage vegetable garden and research area around the café area. The Maori concept of their embodiment of departed ancestors informs the idea of collecting heritage fruit and vegetable breeds (the knowledge of our ancestors) and continuing their preservation and utilisation.

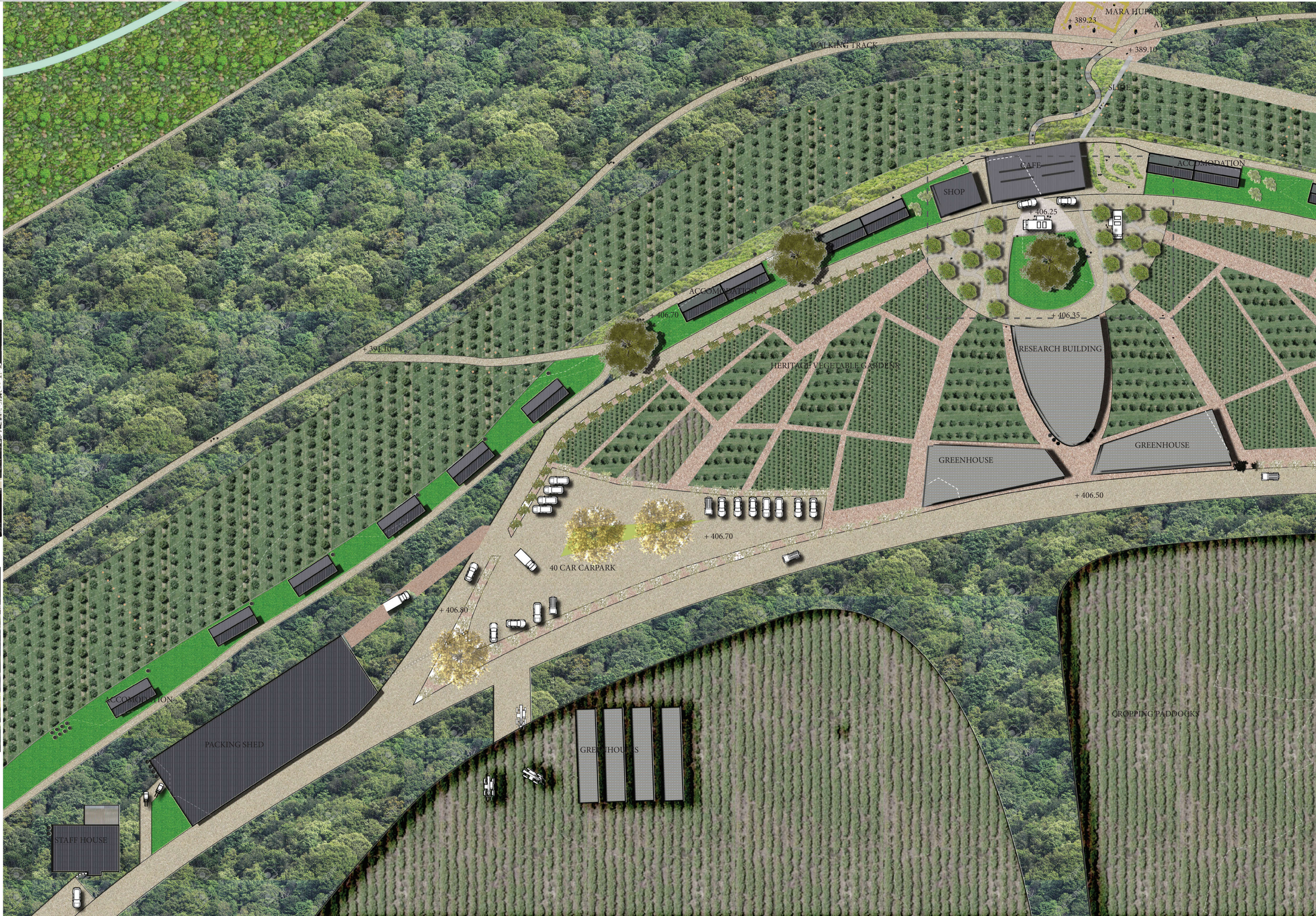


Kids clambering over logs in the Mara Hupara playground.

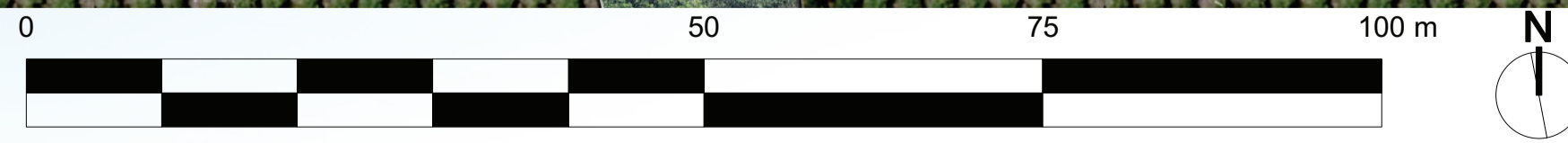


Impression of accommodation huts overlooking the alpine gardens at the top of terrace.

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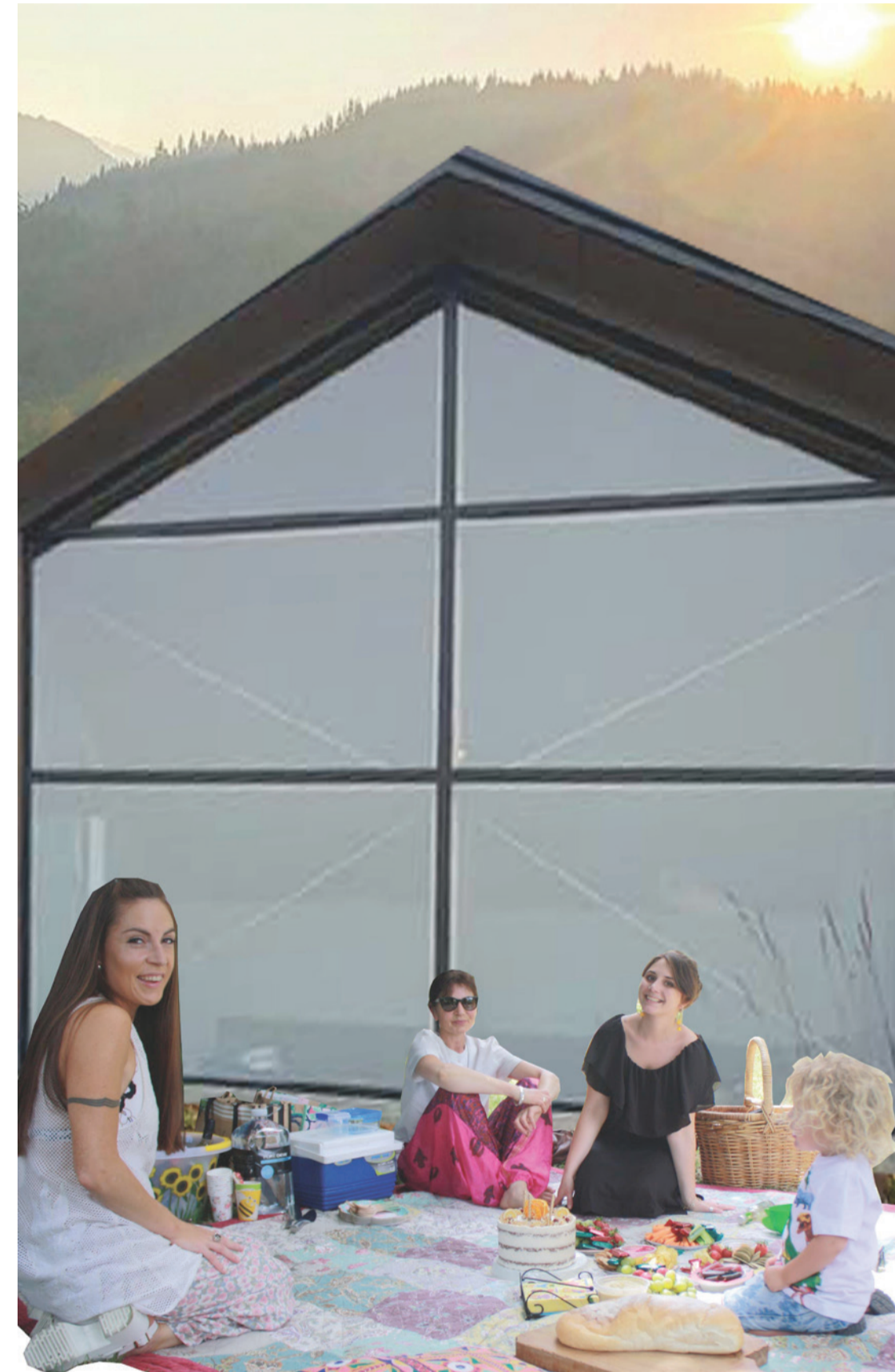
Cross section through Moth Garden



# DETAIL PLAN 1:100



This is the hub of the farm, the first stop when visitors arrive on site. The cafe will be fully plant-based and the shop to its left will sell farm produce and products such as CBD tinctures. The cafe will host vegan cooking and food production classes such as making plant-based milks and cheeses. On occasions the space outside the cafe, around the raised lawn area will be used for market days. It will also function as an outdoor classroom when educational seminars on gardening and horticulture are held. Vehicles can drive into the space around the apple trees. The research building will hold a seedbank of heritage vegetable and marijuana varieties. Horticultural scientists will conduct growing trials for new cultivars and breeds in the garden plots surrounding the facility. To the right of the cafe building are four garden beds featuring some Ngai Tahu taonga species that grow in the area. The cluster of red Ti kouka trees are there as place markers indicating this is the place to stop.



Family having a picnic in on lawn in front of research building.



## KAIMANGA KOWAI DE-STRESS + RE-DRESS



Garden paths will be covered in mulch made on site. This will help retain ground moisture and allow the soil underneath to remain living and connected to surrounds.

# PLANTING



INDICATIVE PLANT SPECIES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Marijuana	Pruning, trimming, mulching		Cover to protect from bad weather	Harvest	Harvest, Drying	Drying, Processing		Start off seeds and cuttings under cover		Prepare soil mix and containers	Pot up seedling and move outdoors	
Apple	Mulch		Start harvesting	Harvest			Winter prune				Set codling moth traps	Thinning
Peach	Harvest, Summer prune, mulch	Harvest, Summer prune, mulch, spray copper after harvest if required					Winter prune			Thinning		
Pear	Mulch		Start harvesting	Harvest			Winter prune				Set codling moth traps	Thinning
Lettuce	Sow seed, harvest	Sow seed, harvest	Sow seed, harvest	Harvest					Sow seed	Sow seed	Sow seed, harvest	Sow seed, harvest
Kale, Cabbage			Sow seed							Harvest	Harvest	Harvest
Oats			Harvest							Direct drill		
Native revegetation		Water young plants if required		Plant cold tolerant species	Take cuttings				Plant new areas, sow seed	Mulch, weed around young plants	Mulch, weed around young plants	

ID	Qty	Latin Name	Common Name	Scheduled Size	Remarks
Aci-aur	53	<i>Aciphylla aurea</i>	Taramea, Golden Spaniard	PB20	Ensure soil is well drained by adding aggregate
Heb-sal	24	<i>Hebe salicifolia</i>	Koromiko	PB 20	Fast growing, fire resistant
Pho-coo	31	<i>Phormium cookianum</i>	Wharariki, mountain flax	PB20	
Pse-col	17	<i>Pseudowintera colorata</i>	Horopito, pepper tree	PB10	Extremely slow growing so plant at close spacing, can be



**SOIL DEPTH**  

 Closer to the floodplain soil is higher quality due to past sedimentation. Erye zone suitable for vegetable and fruit tree planting. Ruapeka perhaps better suited to cereal and oil seed (temp, canola) production.

**WATERLOGGED**  

 These areas become boggy over winter and in heavy rains. Suitable for wetland and native planting.

**SOIL TYPE**  

 The deeper Lyndhurst soils are better at holding moisture so suit vegetable and fruit trees. Larger native patches and corridors should go in the shallow zone as well as marijuana grown in containers and cereal crops.

**OLD WATER CHANNELS**  

 The old water race channel has been filled in but is still depressed in parts. To the east the serpentine depressions are old streams and should be planted in wetland native species.

**IRRIGATED AREA**  

 The central pivot irrigation system draws water from the Kowai River when flow is above a set level. Ironically when water is most needed, flows are too low to take water. This system should be retired at end of serviceable life. In meantime these areas can grow vegetables, crops and fruit.

**STEEP SLOPE**  

 The north-facing slopes are above 50% gradient. Their aspect makes them sun traps, ideal for heat-loving plants like marijuana, grapes etc. The slope makes access difficult so much of it should be replanted in native cover.



**ENTRY MARKERS**

Throughout Te Wai pounamu Ti kouka were planted as way marker trees to guide Maori on their journey. Groups will be planted at road entries and to mark places to stop along tracks.

*Cordyline australis*

**MARIJUANA**

Marijuana (*Cannabis sativa*, *Cannabis indica*) will be the main cash crop on farm. High CBD (medical) strains that are low in psychoactive THC can now be grown under licence and a referendum next year may result in legalisation of recreational marijuana. This is an extremely high value crop with a multitude of uses and there are strains suitable for growing outdoors in Springfield's climate. Industrial hemp production is also viable, as although Springfield does not have sufficient growing degree days for hemp seed production, hemp for fibre is harvested before seed formation.

*Cannabis sativa*

**FIRE RESISTANT**

With climate warming increasing the risk of wildfire, zones of low flammability species (Canterbury foothills plant community) will be planted as green breaks between forest areas and buildings. Best practice is to have a defensible space of 10 to 30m, with scattered low flammability shrubs with crowns at least 4m apart. Planting between productive land patches will be planted in these species also, as well walking track edges, extending 10m either side of the track.

*Coprosma lucida*

*Griselinia littoralis*

*Hebe salicifolia*

**CROPS, FRUIT AND VEGETABLES**

Kaimanga Kowai will aim to be the largest collector of heritage food plants in the Te Wai Pounamu, based on the example of Kay Baxter's Kounga Institute in Wairoa. Her collection of plants contains mostly varieties suited to sub-tropical conditions so our aim would be to focus on nutrient dense varieties better suited to cooler springs and winters, that can be grown with minimal interventions. The aim is for the farm to use regenerative plant-based farming methods and move towards organic certification. We will create a large composting facility and add seaweed to create high quality living soil mix. Our research hub could collaborate with Lincoln University's BHU to breed climate change resilient cultivars which would be available for sale to the public. The fruit species pictured are ones that have thrived with no watering and minimal intervention in the farm's home orchard. The peas, oats and barley are currently grown successfully every year on the farm's dryland paddocks for livestock feed, so provide a good indication of crops suited to the natural conditions.

*Avena sativa*

*Pisum sativa*

*Brassica oleracea*

*Beta vulgaris*

*Juglans regia*

*Ribes sp. (Blackcurrant)*

*Pyrus communis (Pear)*

*Ribes sp. (Redcurrant)*

*Malus domestica*

*Prunus persica*

*Acca sellowiana*

*Malus domestica*

**FOOTHILLS COMMUNITY**

Beech/ Tawhai is the predominant native forest in the Canterbury foothills, evidenced by the two remnant patches of Lord's Bush and Kowai Bush 4km NE of our site. Black beech forms the dominant canopy with podocarp (kahikatea, matai and rimu) laced through moister areas. The understory features a diverse range of shrubs and ferns, while boggy areas feature the usual range of wetland species as well as some rarer ones including *Carex tenaculalis*. The only native plants remaining on farm now, mainly on steep cliffs and rough edges are *Meliclytus alpinus*, *Coprosma prostrata*, *Cordyline australis* and *Muehlenbeckia complexa*. Recently established plantings of totara, tauhata and tawhai are thriving, likely due to the site's relatively high rainfall. Rare species found in the remnant patch at Lord's Bush include *Coprosma pedicellata*, *Carmichaelia torulosa* and mistletoe varieties (*Alepis flavida* and *Peraxilla tetrapetala*) that are growing in old beech trees. The significant patch proposed at our site would use eco sourced seeds from these patches to ensure genetic authenticity and maintain local biodiversity.

*Phormium tenax*

*Carex virgata*

*Hoberia lyallii*

*Prumnopitys taxifolia*

*Dacrydium dacrydioides*

*Juncus edgariae*

*Carex virgata*

*Pittosporum tenuifolium*

*Phormium cookianum*

*Fuscopora solandri*

*Carex secta*

*Coprosma rotundifolia*

*Meliclytus alpinus*

*Pseudowintera colorata*

*Aciphylla aurea*

**ALPINE ZONE**

An alpine zone would be planted at the top of the terrace around the top and accommodation huts mainly as an amenity - educational feature, and to mimic the vegetation change as the altitude decreases. Our site is basically on the cusp of the alpine zone so said species thrive in the conditions, especially if planted in free draining soils. Species will be selected for their interesting textures, and diminutive size, so as to provide an unobstructed viewshed from the terrace top.

*Meliclytus alpinus*

*Pseudowintera colorata*

*Aciphylla aurea*

## KAIMANGA KOWAI DE-STRESS + RE-DRESS

# MATERIALS



Around the property are old totara posts and some old railway sleepers that were used as fence posts back in Kowai Pasture's sheep farming era. Totara is an extremely durable wood, many of these likely to be over a century old. Some are in poor condition but this only adds to their rustic character. One face of the post will be planed and burnished with a silhouette corresponding to a taonga species of plant or animal that either used to be found, or still can be. Examples would be rare Alexander beetles or Coprosma pedicellata found in Lords Bush. Posts will be placed both in-ground on tracks and paths, or fixed vertically beside tracks. A downloadable Kaimanga Kowai app will scan these images and provide detailed information on the species. This is a way of acknowledging the many layers of history of site and educating visitors about Aotearoa's unique and diverse flora and fauna. Recycled sleepers will also be used as walking beams in the Mara Hupara playground.



Every paddock on the farm presently has a water trough. These will be repurposed in various ways including seats and tables for those in poorer condition. They can be cut neatly with a grinder leaving a smooth, polished finish. Those in good condition will be used as a series of ponds for growing puha/ watercress, a nutritious traditional green vegetable for Maori. The concrete ponds would be in series, each lower than the last, fed by a spring on the lower terrace close to the railway bridge. The water would travel through the system and then back into the river and this would be a mahinga kai feature on the Kowai River Pounamu trail.



Large sleepers can be used for seating.



10 - 20mm particle size lime driveway chip is sourced from local business Springfield Lime. It compacts well, the particles locking together and staying in place. It is a semi-permeable surface so capable of absorbing light rain. A collaboration with Springfield Lime could result in a joint commercial hempcrete business, hemp fibre and lime being the two key ingredients in a vastly greener concrete substitute for non load bearing applications.



0 - 9mm particle size pathway chip will be used on all pedestrian tracks on farm. It provides a grippy stable surface with nice crunch underfoot and is capable of absorbing light rain.



Pea gravel will be used for some surfaces for example around the arrival area where it will be set in concrete. This is a great material to use as it is interesting to look at, with all the subtle variations in colour and shape and it is local and found all around the Kowai River.



River boulders will be used on site for seats, stepping stones in the Mara Hupara playground and for garden edging. Again this is a local material and boulders can be found on site and around river bed.



Treated fence posts from fencelines will be recycled and used as footing for viewing platforms and boardwalks around wetlands. Although the goal is to eliminate toxic chemical use on site in this case these are repurposed and the only other viable alternative for in ground footing would be concrete which would have a bigger environmental footprint.

## KAIMANGA KOWAI DE-STRESS + RE-DRESS



# WHEN GRASS IS NOT GREENER : A SUSTAINABLE KOWAI PASTURES



HOW CAN A CANTERBURY DAIRY FARM DEMONSTRATE SUSTAINABILITY & REBUILD ITS SOCIAL LICENCE TO OPERATE ?

# WHEN GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PAS-

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# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

How does a Canterbury dairy farm demonstrate sustainability and environmental stewardship, and rebuild its social licence to operate ?

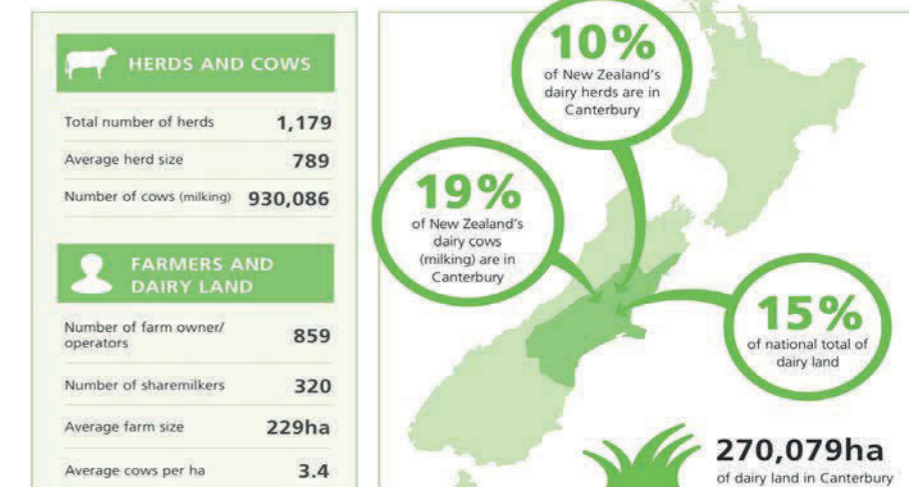
## THE LOCATION

**Kowai Pastures** is situated on State Highway 73 in West Canterbury, just out of the small town of Springfield, heading up towards Arthur's Pass. The property forms a wedge between the highway and the Kowai River, pointing west from the Springfield township boundary towards the Kowai River Bridge. The trans-alpine railroad marks the north-eastern boundary, with distant hills to the west, north and south. Its location at the juxtaposition between alpine and plain landscapes, river and land, as well as road and rail transport routes, opens a range of opportunities for environmental and recreational developments.



## Some numbers...

- 550** milking cows
- 220 ha** freehold irrigated land
- 40 ha** of river frontage and terraces leased off ECAN
- 15 ha** exotic tree cover including hedgerows
- <1ha** indigenous vegetation
- 400m asl** elevation



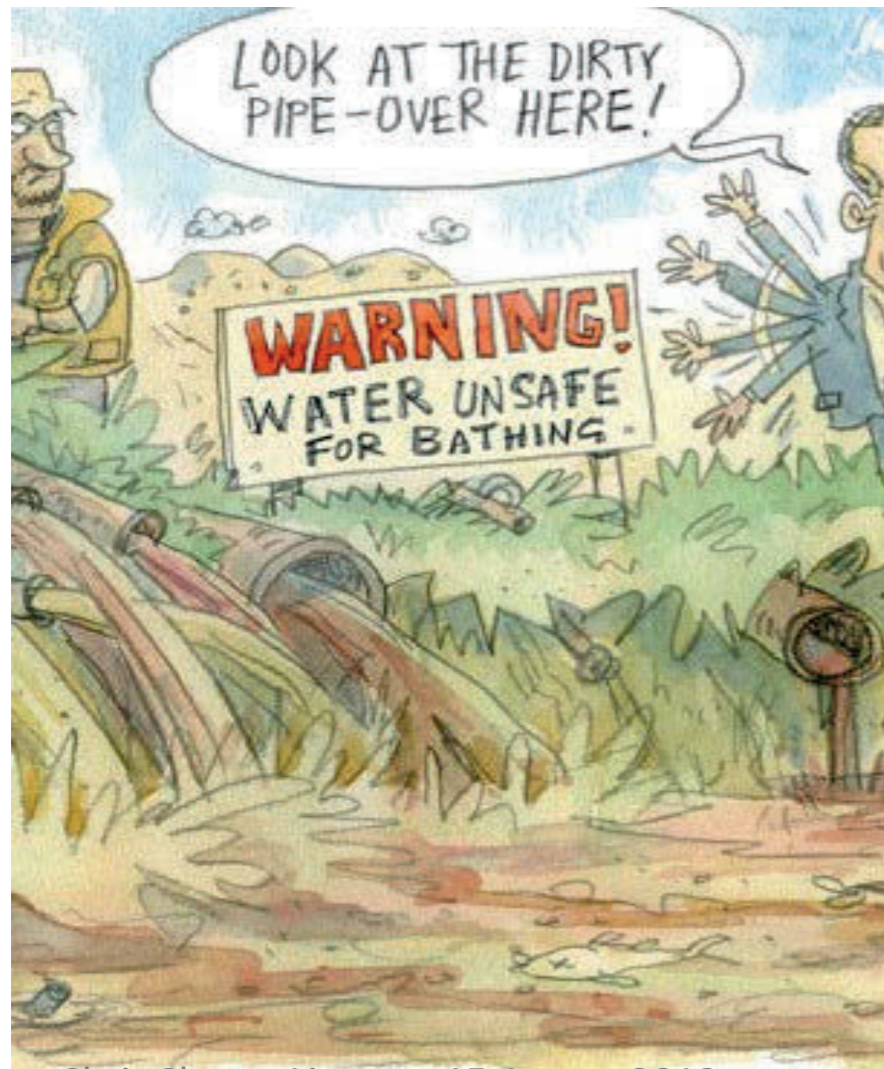
<https://www.dairynz.co.nz/media/5418032/quickstats-canterbury-2015-16.pdf>

## A FAMILY FARM IN CANTERBURY

**Kowai Pastures** is a fairly typical family-owned Canterbury dairy farm. It converted to dairy from sheep farming in 1994 following the dramatic rise in international milk price and demand. It is owner operated, with two full-time employees, and some extra staff during calving season. The farm grows pasture, as well as maize, peas and oats for silage, and brassica fodder crops for winter feed. A diesel-powered pump draws water directly from the adjacent Kowai River. Water is pumped more than 25 vertical metres to the top level where it is delivered through a central pivot irrigator. The milking herd winters on-farm but replacements are raised on other properties. Palm Kernel Extract and molasses are fed in the milking shed throughout the milking season. Agricultural contractors do most heavy machinery tasks such as spraying, ploughing, drilling, baling and making silage. In spite of bordering a substantial river there is virtually no native flora on the farm. Ungrazed land is dominated by exotic weeds broom, gorse and salix beside water.

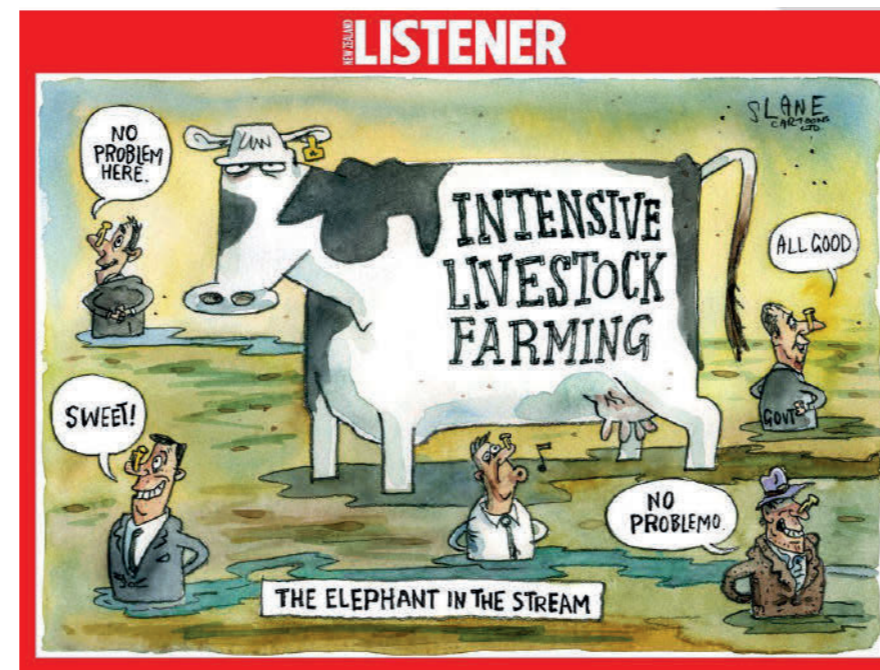
# The where and the what .

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES



Chris Slane - Listener 15 August 2013

Dairy has grown to dominate the Canterbury landscape over the past two decades. Initially the change was welcomed, the “white gold rush” boosting small communities, and national exports. Land values shot up, as farmers and investor groups clambered to get their slice of the dairy pie. Environment Canterbury, an elected body responsible for safeguarding the region’s environmental assets, was disbanded by the government, due to councillors’ inability to reach consensus over water abstraction and land use permits holding back ‘development’. The new Ecan fasttracked the wholesale conversion of land from sheep farms, to the far more resource- hungry dairy farms.



Apart from GHG emissions globally livestock are responsible for:

- 55 % of the sedimentation of waterways through accelerated erosion
- 37 % of pesticide use
- 50 % all antibiotic use
- 64 % ammonia loss
- 33% of anthropogenic nitrogen and phosphorus to freshwater resources

Steinfeld, H. 2006. Livestock's Long Shadow; environmental issues and options. Food and Agriculture Organisation, Rome.

The public were noticing declines in water quality and quantity in local streams and rivers. These issues were highlighted by Fish and Game NZ's 'Dirty Dairy' campaign started in 2002. This led to a voluntary agreement, the 'Dairying and Clean Streams Accord' between Fonterra, MAF and regional councils, replaced in 2014 by the 'Sustainable Dairying: Water Accord'. That same year the global dairy price tumbled. Dairy was no longer beyond reproach. In the 2017 election, environmental damage caused by dairying was a major issue. There were debates on what constituted swimmable or wadable rivers. There was plenty of talk of the widening rural-urban divide, driven by this issue. It wasn't just the greens complaining now. To many it seemed that the environment had been damaged by farmers only concerned with money.

It is this public backlash that has revoked farmers' social licence to operate. The opportunity is for this farm to showcase sustainable practices and responsible environmental stewardship. This can be done by reducing the impact on the land, protecting ecosystems and enhancing native biodiversity, while providing public access to education and recreation.

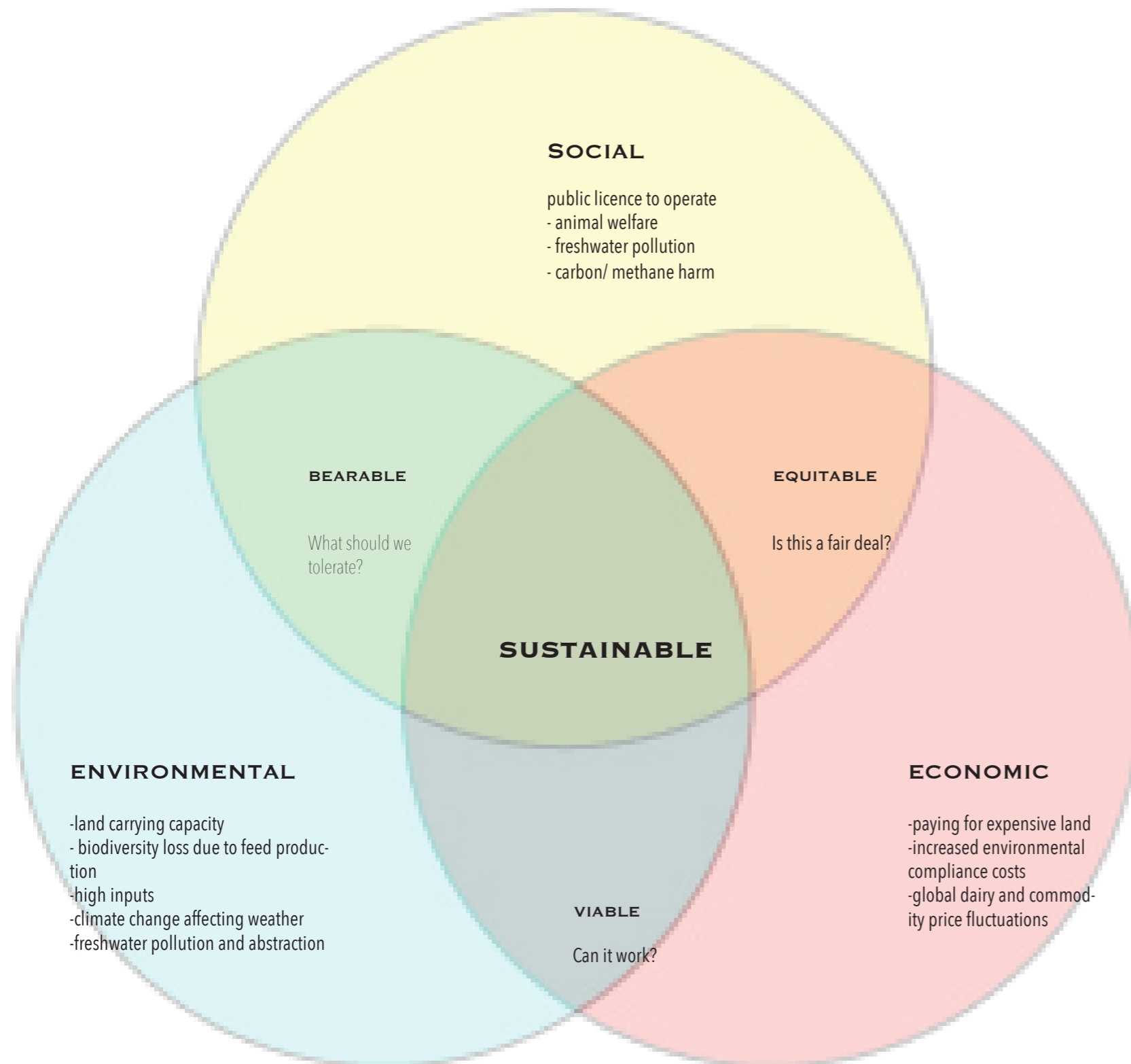
## Dairy farms use equivalent water of 60 million people, experts say

CHARLIE MITCHELL  
Last updated 11:52, September 18 2017



# What's wrong with dairy in Canterbury?

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES



Sustainable land management means responsible landcare - caring for our natural resources in ways that ensure ecological, economic and social benefits for present and future generations. The key aim is to be and to appear to be sustainable, meaning in this case, to remain agriculturally productive while enabling continued survival of native biodiversity around the river and farm margins. This can be broken down into biodiversity and pollution themes. The second aim is multifunctionality, or to find ways of using tourism or other income sources to allow lowering of stock numbers.



According to the MFE :

“sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—

- (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
- (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.”

Resource Management Act: <http://www.legislation.govt.nz/act/public/1991/0069/latest/DLM231905.html>

## What does sustainable even mean in this context?

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## Rebuilding dairy farming's social licence to operate with the public

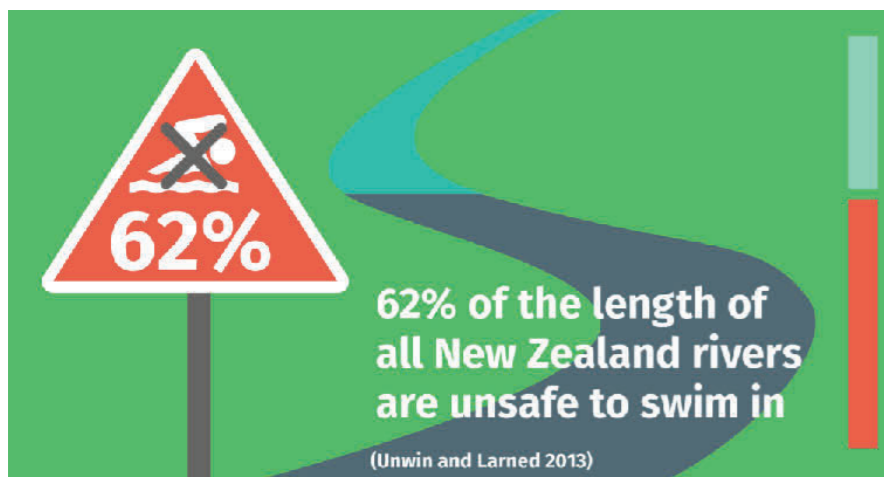
PAT DEAVOLL  
Last updated 12:01, November 1 2017



Go above and beyond compliance, for legislation is already forcing farmers into a corner and that corner will only get smaller, says Michael Woodward.

A study I by Canterbury dairy farmer Michael Woodward on social licence and the urban-rural divide concluded that a significant proportion of the public no longer trusted farmers or felt that they had similar shared values. He was of the view that this was in large part due to misinformation and the failure of farmers to get their message across. I would disagree with his assessment, arguing that as more facts about the scope of environmental damage caused by dairy intensification and the public cost to remediate come to light, public opinion of the industry will worsen.

Woodward, M. (2017). *The Urban Rural Divide: How can the New Zealand Dairy Industry protect and better its social licence with New Zealand's Urban Populations*. Kellogg Rural Leadership Paper



## Dairy farms use equivalent water of 60 million people, experts say

CHARLIE MITCHELL  
Last updated 11:52, September 18 2017



There are around 12,000 dairy herds in New Zealand.

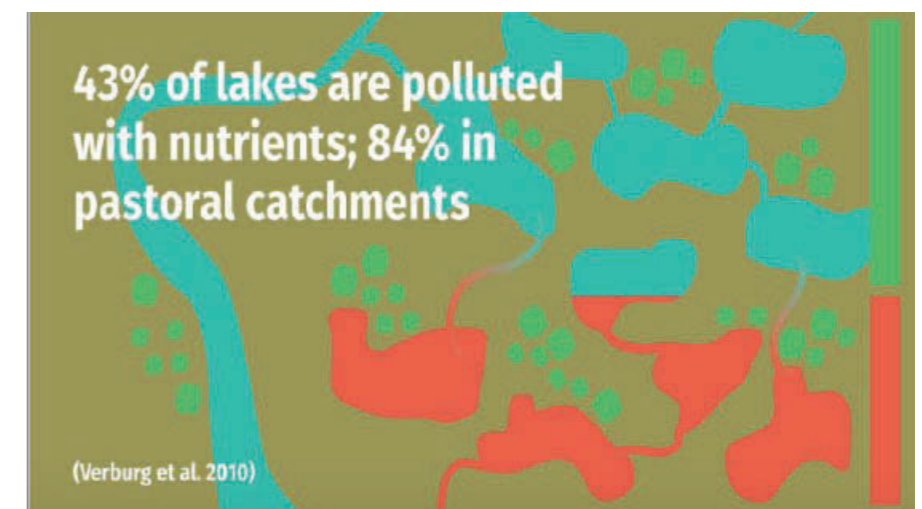
DIRISTEL YARDLEY/STUFF

The early years of the dairy boom were mostly welcomed by the public who saw the dramatic boost to the rural and national economy. For farming communities it was transformational, turning struggling sheep farms to million dollar businesses virtually overnight. Dairy farmers were seen as progressives, providers of employment, on farm and beyond, and the backbone of the "rockstar economy". Cracks began to show when the international milk price plummeted in 2014 and low prices continued until 2017. This coincided with extremely low river levels and Fish and Game's Dirty Dairy Campaign, highlighting the damage being done to freshwater.

People started questioning the industry that had previously been beyond reproach. Why were dairy prices so high in supermarkets? Why were dairy farms still offering employment conditions too poor to attract most New Zealanders? How much water were they allowed to draw free from public rivers while levels continued to drop? Who was going to pay for the pollution of freshwater? What was the average New Zealander getting out of this dairy deal? Had the small community farmer been replaced by faceless syndicates and corporations? These were the issues that led to a growing anti-dairy sentiment, or their loss of social licence to operate.



Animal Welfare is playing an increasing role in social licence issues as was highlighted by media coverage when SAFE ( Save Animals From Exploitation) and animal rights group Farmwatch, released video footage of bobby calves being dragged over the ground by their feet and roughly thrown onto stock trucks. Farming groups were quick to condemn the culprits, stressing these were isolated incidents by rogue operators. Animal welfare groups argued that this was standard practice in an industry with little regard for animal welfare unless it affected their income. Seeing cows spending their winters in knee deep mud with no shelter reinforces this view. Although MPI has tightened rules around calf transportation and handling, this has done nothing to appease animal rights activists who aim to end all livestock farming. These movements appear to be gaining traction both locally and internationally so animal welfare issues are set to play a bigger part in the social licence debate into the future.



# What is this social licence to operate?

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

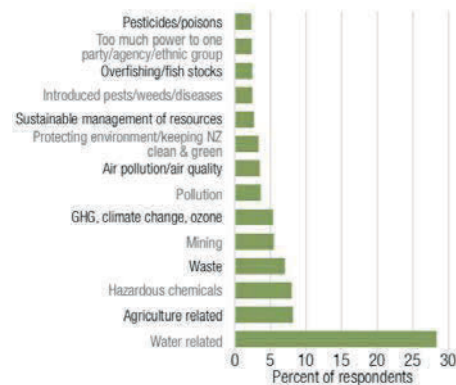


Figure 3.20. Most important issues facing New Zealand (Note – items only included where at least 2.5% of respondents identified the issue).

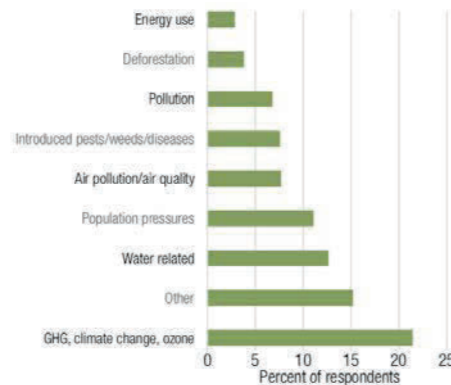


Figure 3.21. Most important issues facing the World (Note – items only included where at least 2.5% of respondents identified the issue).

**Resource 1:** Hughey, K. F., Kerr, G. N., & Cullen, R. (2013). *Public perceptions of New Zealand's environment: 2013*. EOS Ecology.

**Principles:** Although the New Zealand public generally believes the environment to be in a better state than it is, more than half of the respondents cited farming as major cause of freshwater pollution.

It was surprising that respondents identify forestry and urban development as important causes of damage to native forests when their impacts are absolutely minimal, especially compared to the much larger impacts from farming.

**Site application:** to regain social licence it is critical to address freshwater pollution and environmental issues.

**Issues:** The scale of the issue is huge and with such a large farm-river



**Resource 2:** Dairy NZ, *Riparian Planting guide for Canterbury*.

**Principles:** improve water quality and public perception by riparian planting, provides step-by step methodology

**Site application:** Tailored for Canterbury, practical advice on scoping, species selection, planting and maintenance.

**Issues:** too broad (Canterbury scale), may need more targeted guidelines due to site elevation and location on braided river bank. More targeted information needed.

**Resource 3:** Picuno, P., Stanovčić, T., Moric, I., Dimitrijević, A., & Sica, C. (2015). *The valorization of vernacular farm buildings for an innovative rural tourism*. In Proceedings of the 43rd International Symposium on Agricultural Engineering, Actual Tasks on Agricultural Engineering, Opatija, Croatia, 24-27 February 2015 (pp. 807-817). University of Zagreb.

**Principles:** rural tourism, Using vernacular buildings, drawing on local character to promote.

**Site application:** Drawing on the Springfield vernacular, railway town, for carriage or worker huts as accomodation overlooking tracks, farm shed or animal trailer conversions to accommodation.

**Issues:** On site lack of such original buildings and costs and practicalities of such conversions.

**Resource 5:** Barkema, H. W., Von Keyserlingk, M. A. G., Kastelic, J. P., Lam, T. J. G. M., Luby, C., Roy, J. P., ... & Kelton, D. F. (2015). *Invited review: Changes in the dairy industry affecting dairy cattle health and welfare*. Journal of dairy science, 98(11), 7426-7445.

**Principle:** Social pressure increasing for improved dairy practices.

**Site application:** Stay ahead of best practice recommendations because public perception bar is higher, increased shelter by hedges or plantings will help this.

**Issues:** growing public sector who will not be satisfied by any welfare improvements as fundamentally opposed to animal agriculture, but improvements reduce the heat.

**Resource 6.:** Brown, M. A., Stephens, R. T., Peart, R., & Fedder, B. (2015). *Vanishing Nature: facing New Zealand's biodiversity crisis*. Environmental Defence Society Incorporated.

**Principles:** Much of NZ biodiversity is under critical threat, more species threatened with extinction here than any other country in UN, biodiversity not fungible, so critical places like Canterbury Plains do more to restore ecosystems, Under current laws avoidance of environmental effects, restoration and environmental compensation are discretionary.

**Site application:** Canterbury River ecosystems are among the most degraded and threatened, crucial to restore and protect. Need to do way more for environment than required by law if situation is to improve.

**Issues:**

**Resource 4:** Monica Gorman, Joe Mannion, Jim Kinsella & Pat Bogue (2010) *Connecting environmental management and farm household livelihoods: The Rural Environment Protection Scheme in Ireland*, Journal of Environmental Policy & Planning, 3:2, 137-147, DOI: 10.1002/jepp.76.

**Principle:** multifunctionality farming model, balance acceptable income with environmental improvement

**Site application:** agro-tourism options, nature management options e.g. a specialist native plant nursery

**Issues:** subsidy from government is often needed for transition.

# A look at the literature. .

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## **Lewis Rd Creamery**

Organic milk supplier aiming for gourmet market, processes its own milk and claims better than standard animal and environmental treatment. Regarding the animal treatment, they only speak of it meeting the Animal Welfare Act, which is no different from requirements of any other farmer. They are grass fed, PKE free which means not supporting Indonesian deforestation.

**Principles:** Organic, PKE-free and claiming best animal welfare practices improve public perception and therefore social license prospects.

**Site applications:** Going organic and PKE free may be possible with reduced stock numbers, and going independent of Fonterra can also raise credibility in a certain market.

**Issues:** Feels like marketing speak, unsure whether this will stand up to rigorous examination.

## **Flock Hill Station.**

This is a high country station which has installed vernacular farm building themed accommodation e.g. shearer's quarter's backpackers.

**Principles:** multifunctionality, diversifying farm income by providing accommodation, and using farm vernacular buildings as point of difference. In this case they also provide meals from farm produce.

**Site application:** A similar approach could be taken, our site also boasts outstanding views, and farm produce could be sold for consumption.

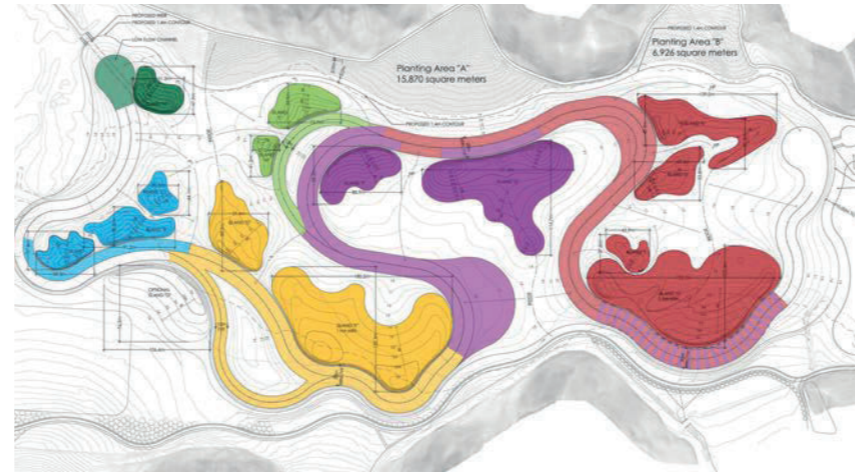
**Issues:** Some of the Flockhill accommodation was brand new and not made using recycled materials, feels like a façade, also as there are not many old buildings on our site, the same issue of authenticity may arise.

# Case studies: Flock Hill Station,

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## About:

Orongo Station is touted as an exemplary example of sustainable agriculture in New Zealand. Over the course of a decade, American landscape architecture firm NBW redesigned the 3000acre farm so that sustainable agriculture could combine with ecological restoration. This was done by setting aside 13 per cent of the land area for biodiversity projects carried out in conjunction with farm managers and a multidisciplinary team of scientists. The goal was not to recreate nature but rather to use science to inform landscape design, (Myer, E., 2013). Cultural, ecological and agricultural/ productive landscapes are all considered and integrated in the design.



The 75-acre "painting" created by riding a motorcycle through the tall grasses, making long and winding curves. An excavator followed behind shaping the paths, dams and islands. Photo: <https://alastairgordonwalltowall.com/2014/10/27/orongo-station-new-zealand/>

## Principles:

Multifunctionality, combining farming with environmental protection and other income streams ie. accommodation.  
Engineering solutions for effectiveness rather than restored natural aesthetic.  
Acknowledging cultural history and tangatata whenua- restoration of historic urupa on the property that is still in use. Maori were consulted and earthwork forms such as defense structures were preserved and used as further design inspiration.

## Issues:

Financial cost from less land used for production.  
Financial cost for restoration work  
Is this really a sustainable system? The sustainability of the farming side is not discussed although obviously its footprint will be reduced due to less area and the mitigatory effects of wetland and native revegetation.  
Can animal agriculture be sustainable?

## Applications:

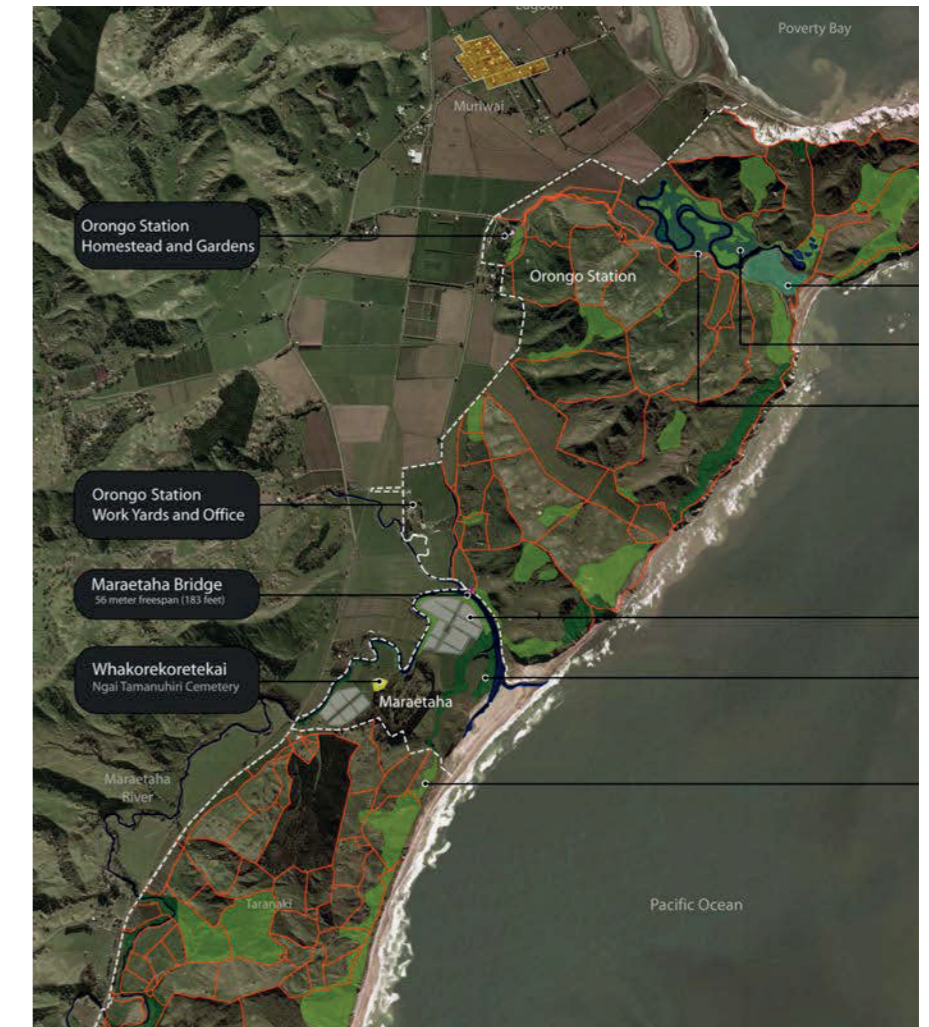
Multifunctionality and diversity are good.  
Man-made landforms can look as good as natural ones, the key is functionality  
Acknowledge and engage with site's land, historical and cultural layers.

## References:

Myer, E. *Multifunctional Beauties*. in Byrd, W. T., & Woltz, T. L. (2013). Nelson Byrd Woltz: Garden, Park, Community, Farm. Princeton Architectural Press.



300mm terraces formed by sheep walking parallel to slope are now used to plant native trees. Photo: Byrd, W. T., & Woltz, T. L. (2013). Nelson Byrd Woltz: Garden, Park, Community, Farm. Princeton Architectural Press.



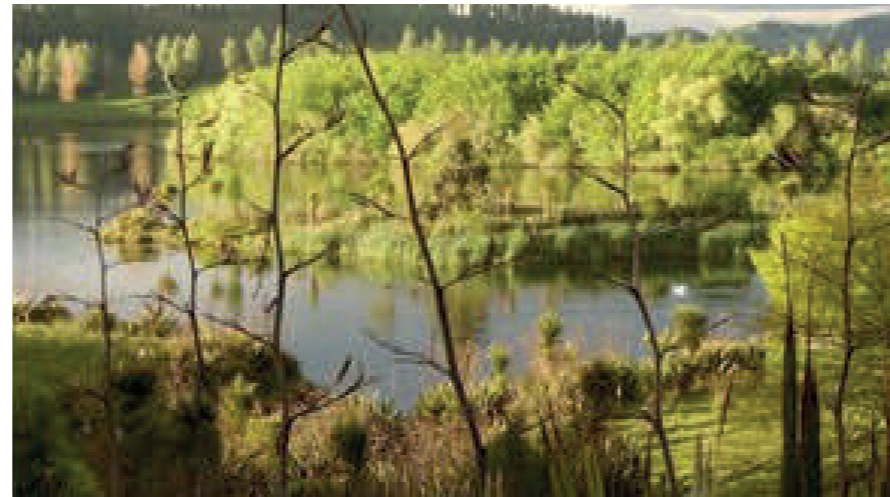
Aerial showing overview of Orongo Station situation on the Poverty Bay coast. Photo: [https://www.asla.org/2010awards/images/largescale/205\\_01.jpg](https://www.asla.org/2010awards/images/largescale/205_01.jpg)

# Case study : Orongo Station, Poverty Bay

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## About:

Mangarara is a 610 hectare hill country farm in Elsthorpe, Hawke's Bay. The farm features a diverse mix of natural features like lakes, wetlands, peat flats, rolling and steep hills, pasture, native and exotic trees. Over the past 15 years the owners have taken the property in a new direction, embarking on a massive tree planting drive sponsored by Air New Zealand and changing the farming style to holistic grazing. This means that rather than graze paddocks short, big mobs of cattle are moved on quickly leaving long grass trampled into manure which is said to improve soil health and sequester carbon. Free range meat is directly marketed to customers and income is supplemented by proceeds from their eco-lodge.



## Applications:

The regenerative farming model could be something Kowai Pastures moves towards as it de-stocks and transitions away from a high input system. Looking for a corporate sponsor for conservation work on Kowai Pastures could also be an option.

However the main area that impressed was the community engagement. Firstly a link is maintained with Air NZ by bringing out staff for planting days. Secondly people in the community can become supporters and get involved on farm, including picking their own fruit from food forest. Thirdly a percentage of fees from Eco-lodge is set aside and used to accommodate members of vulnerable community groups like Woman's Refuge on the farm. This embracing of and generosity to the community is how a social licence can be regained.



## Principles:

Healthy food production using "regenerative agriculture". This is a method pioneered by Alan Savoury aiming to mimic the natural processes on African savannah where large herds quickly move through areas of grassland leaving behind rich compost.

A balance between nature and production agriculture and ecosystem restoration

Strong focus on soil health, carbon sequestration and planting native and food producing trees.

Providing education, accommodation and inspiration and sharing the farm's resources with the community.

Animal welfare is taken seriously, all life is respected and placed above profit.



Images from :<https://www.mangarara.co.nz/mangarara-eco-lodge>

## Issues:

The restoration work has been greatly boosted by the Air New Zealand Environment Trust paying \$450,000 over 3 years to plant 85,000 trees which has taken financial pressure off the venture.

Another issue is the controversy attached to this regenerative farming model, whether it does sequester carbon as claimed and if it can be profitable under normal financial pressure.

Latest research (Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992). finds that even the most sustainable forms of animal agriculture cause environmental damage. However it obviously makes sense that a natural low input method like this would have less environmental impact than conventional farming.

# Case study : Mangarara Station, Hawkes Bay

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## Environmental

There are many environmental issues associated with dairying in Canterbury. First is the need for huge volumes of water to keep grass growing in a naturally dry climate. This affects freshwater ecosystems by reducing flows. Second is the widescale pollution of freshwater from dairy effluent, fertilizer and farm chemicals. The amount of nitrate entering groundwater from dairy activities is >60,000,000kg p/a. The dilution needed to meet 0.8 mg/l (safe level) is 79 trillion litres, 13,600 litres per litre of milk (Joy, M. 2017. Our Deadly Nitrogen Addiction. Massey University Press). Third is the biodiversity loss. Canterbury's biodiversity stock was among the country's poorest before the dairy boom, but has since declined even further.

**“The greatest negative impact on river water quality in NZ in recent decades has been high-producing pastures that require large amounts of fertiliser to support high densities of livestock”**

Julian, J.P., de Beurs, K.M., Owsley, B., Davies-Colley, R.J., and Ausseil, A.G.E. (2017) River water quality changes in New Zealand over 26 years: response to land use intensity. Hydrology and Earth System Sciences 21(2), 1149-1171. (page 1167)

## Opportunities

The key opportunity here is to reestablish significant native plant patches on the property. If the majority of the 40ha of riverside land leased off ECAN is planted in natives, this will become a significant biodiversity rich patch as well as act as a substantial buffer zone for any leeching of nutrients from the higher productive areas. Once native plantings are established this will attract more native birds and the health of the Kowai River and surrounding wetland ecosystems will be vastly improved. This also happens to be the main way of addressing the social licence issue too, particularly if this is done with community involvement

## Social Licence

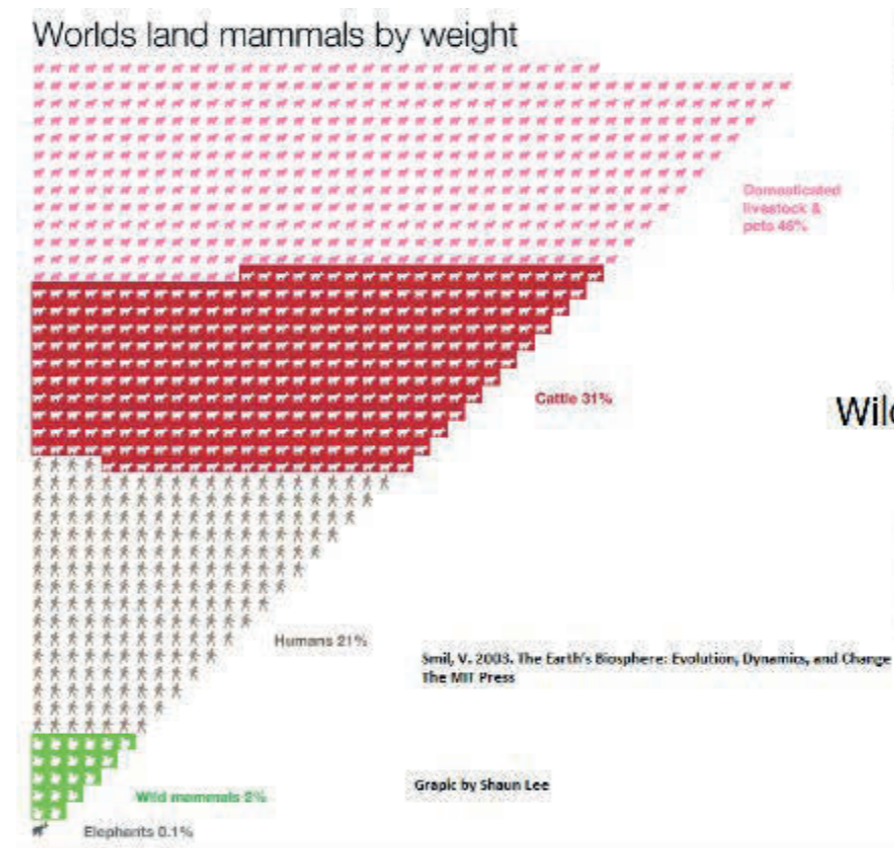
The environmental damage associated with large scale dairy conversion such as pollution of freshwater and biodiversity decline are key reasons for the public backlash against dairy. There is also the feeling that dairy farmers are greedy and exploitative, out to make money at any cost. Increasing corporatisation in the sector contributes to this feeling, as well as foreign purchases of farmland and the employment of cheap foreign labour on many farms. If this is the backbone of NZ economy, how come the people on the ground can't be paid enough to make it an attractive job for NZ workers? Animal welfare is another topic of growing concern to the dairy sector. SAFE video footage of mistreatment of bobby calves brought the issue to public attention so now the public is vigilant for instances of poor livestock treatment. Public campaigning and pressure has resulted in stricter regulations regarding handling and transportation of livestock. However, no regulations can change the fact that livestock farming is inherently cruel and growing numbers of public are choosing to stop consuming

## Future of Food

Each year the world population increases by 80 million. The reason we are able to produce enough food is fossil fuels.

## Abstract

Over the past two decades, major increases in production have occurred in the New Zealand dairy industry. This has required the use of externally sourced inputs, particularly fertiliser, feed supplements, and irrigation. Contemporary New Zealand dairy farming practice incurs environmental externalities: impacts that are not paid for by the dairy



About:

# Summary of issues and opportunities

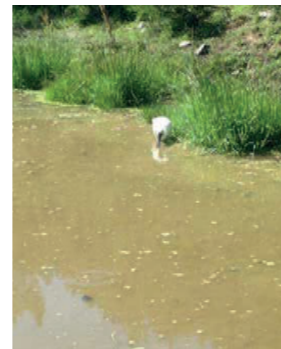
# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES



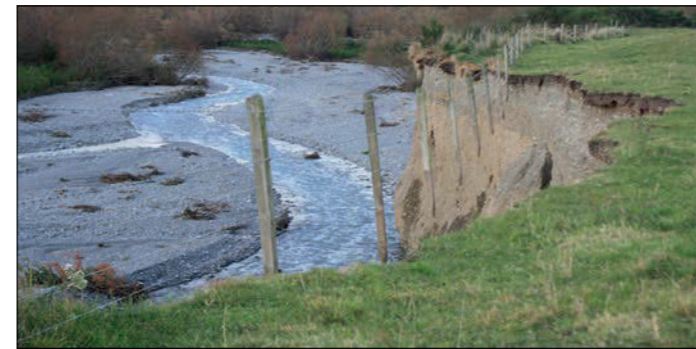
Kowai Pastures (green) from Torlesse Station looking south



View looking north



Spring-fed pond feat. Royal spoonbill



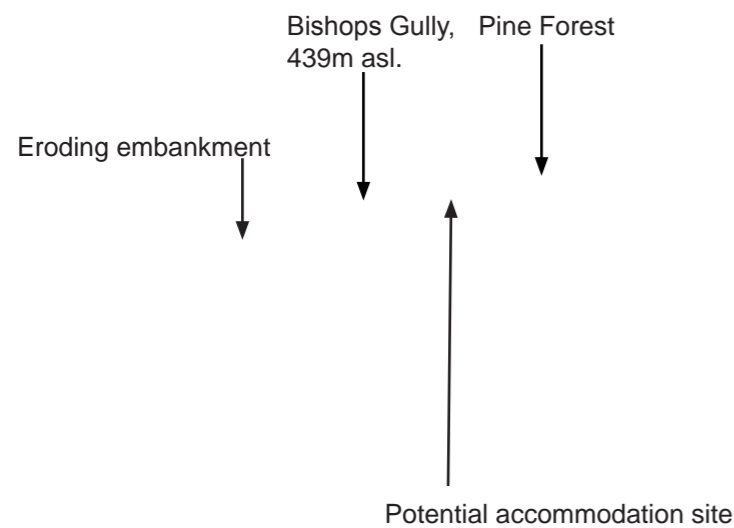
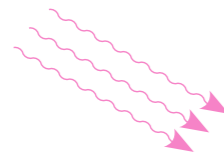
Eroding embankment



Two wild native species, *M. complexa*, *C. propinqua*



NW winds in summer have caused severe damage to farm buildings and irrigators.



Wetland area (spring-fed)

A1

Amazing Apple Tree, unknown variety, with no care produces heavy crops of unblemished and tasty orange fruit each April. Apple farm?

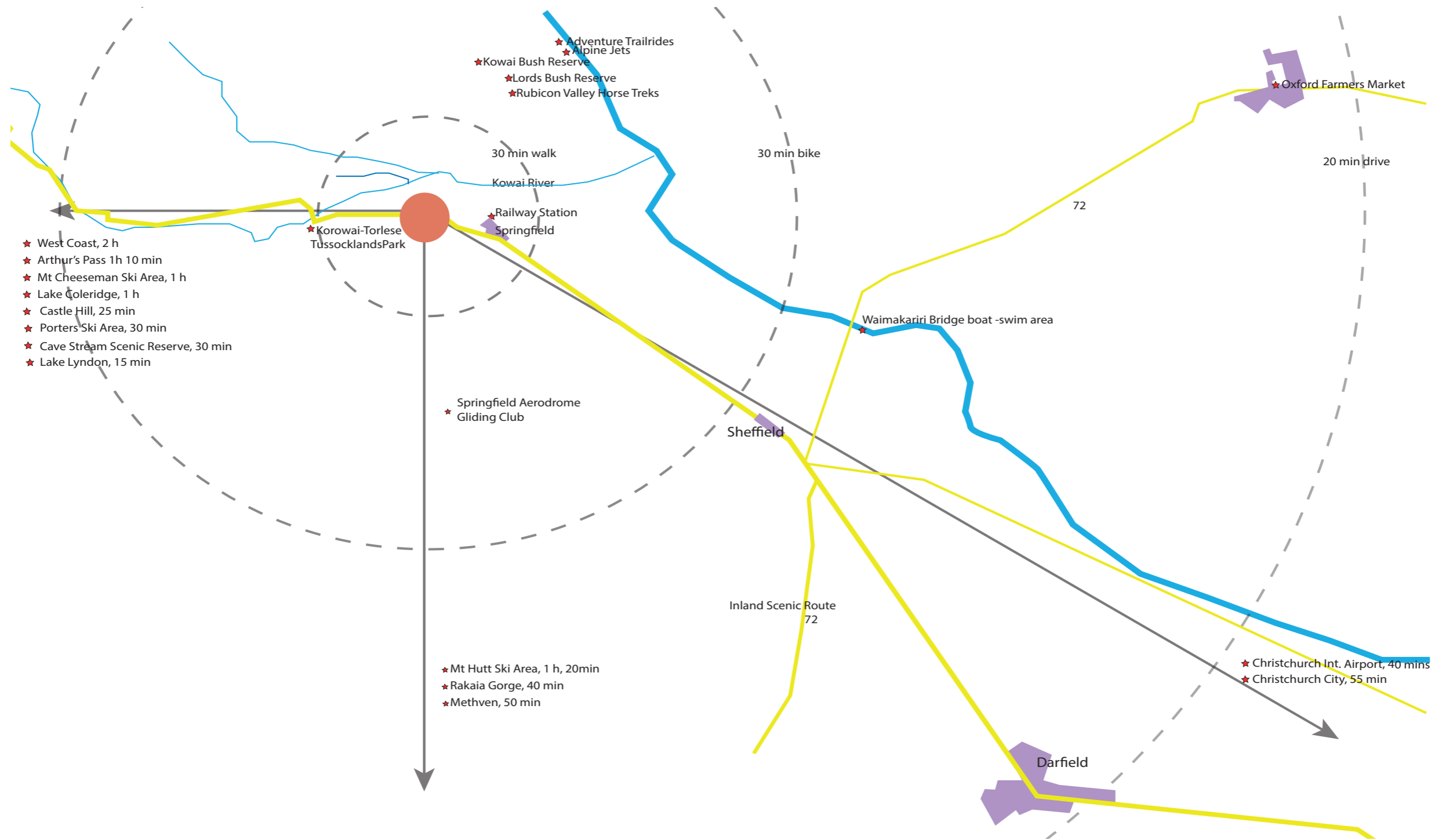
Bluegum Forest

A

- Dept. of Conservation (DOC) land
- Steep slope
- Soggy ground
- Farm buildings/ accommodation
- Central pivot irrigated land

# Inventory and Analysis : Site Inventory

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES



## Inventory and Analysis : Attractions & Activities

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

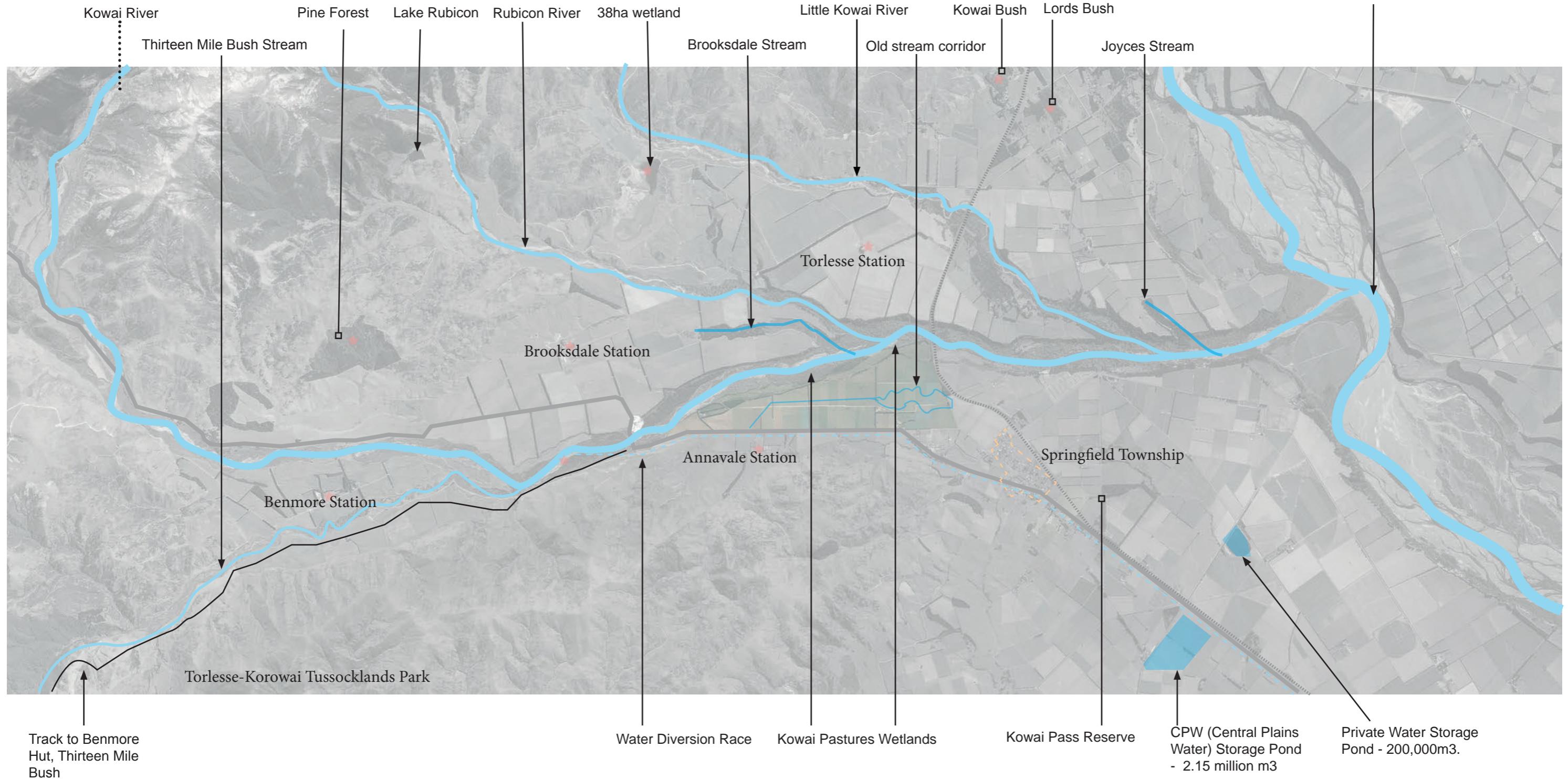
Small mountain beech patches are scattered around at higher elevations as are alpine scrub patches containing porcupine scrub, Coprosma spp., Astelia fragrans, Myrsine divaricata etc. All these species would thrive on Kowai Pastures marginal lands.

At river confluences in the lower reaches there is increased vegetation cover and higher biodiversity. There is an opportunity to create a native plant corridor running from the Waimakariri River, through our site, linking all the way to Thirteen Mile Bush and the Torlesse-Korowai Tussocklands Park.

Indigenous biodiversity on Kowai Pastures is presently low. *M. complexa* and *C. propinqua* are found on rough edges, as well as native sedges and rushes in wetland areas. Groups of juvenile Kea are sometimes seen, also piwakawaka.

These are high value but small remnant black beech-kahikatea bush patches supporting kereru, piwakawaka and NZ robins as well as rare Alexander beetles, and Tussock butterflies.

Central Plains Water Scheme abstracts water from the Kowai and Waimakariri Rivers to be stored for irrigation. Schemes such as these increase reliability of irrigation water supply and tend to encourage more water intensive farming activities on affected land and cause negative consequences to waterway health from reduced flows.



## Inventory and Analysis : Attractions & Activities

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

**Pounamu Trails:** In pre-European years Kai Tahu used several routes to carry pounamu (greenstone) to their major Kaiapoi trading post from the West Coast, including following the Waimakariri and then the Kowai River up through Porters or Browning Pass. The route chosen depended on the travelling group's capabilities, weather conditions and time of year.

**Surveyors Trails:** In 1949, surveyor Charles Torlese, led by Maori guides, climbed Mt Torlesse and made a track over Porters Pass. In 1865 gold was discovered on the West Coast and a road linking to Canterbury was desperately needed. A young surveyor and fluent Maori speaker, Arthur Dudley Dobson, had explored the Southern Alps assisted by Maori trackers a year earlier, and identified what would become Arthur's Pass, as the easiest route over the mountains. His father Edward Dobson was responsible for the road's construction which was completed in a year.

**Kowai Pastures:** Like most of its neighbours, Kowai Pastures was established in the 1860s as a sheep farm. In 2001 it was converted to dairy. It sits at a natural junction between mountains and plains, water and land, adjacent to road, rail and waterways, and this unique position offers opportunities to be more than just a farm. This could be a gathering place, a launchpad for adventure.

**Kowai Bush Reserve** was one of the earliest European settlements in NZ, established around 1860. Kowai Bush is described in Waitaha Maori lore, as a prime spot for hunting kereru, kaka and weka.

The Midland Railway reached Springfield in 1880, but due to the difficult terrain, the line west was completed slowly, in several stages. It was slow work with horses and picks and shovels, but by 1906 the line had reached Broken River. Arthur's Pass was reached in 1914, but it was not until 1923 that the Otira Tunnel was finally completed linking east to west. Springfield town still features rows of railway worker cottages.



MT Torlesse (Kuratawhiti) and nearby mountains Grey (Maungatere) and Oxford (Tawera) are considered Kai Tahu ancestors, who swam to shore from an overturned waka, and turned to stone.

The road through to the West Coast was opened in 1866, and The West Coast Coach Service ran the two day journey from Springfield twice a week. Passengers would travel by rail from Christchurch to connect to the service. An overland mail service between Christchurch and Hokitika had begun a year earlier by Cobb and Co., done part by coach and part by packhorse.

Springfield Hotel, established in 1862, was initially quite modest but the growing traffic to the West Coast and Springfield's reputation as a health resort led to subsequent enlargements.

## Inventory and Analysis : Attractions & Activities

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

Inventory and Analysis : Summary

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## GOAL 1:

INCREASE INDIGENOUS PLANT BIODIVERSITY ON FARM.

### OBJECTIVES

1. IDENTIFY LEAST PRODUCTIVE AND MOST ECOLOGICALLY SENSITIVE AREAS ON FARM.
2. BEGIN PLANTING IN THESE AREAS WITH APPROPRIATE NURSERY SPECIES.
3. USING AN ECO-SUCCESSION PLAN, REVEGETATE AREAS AS APPROPRIATE.

## GOAL 2:

ESTABLISH FARM AS KEY NODE ON NEW KOWAI RIVER WALKWAY AND IMPROVE CONNECTION TO SPRINGFIELD COMMUNITY.

### OBJECTIVES

1. ESTABLISH BIKE TRACK BESIDE RAILROAD FROM RAILWAY STATION TO FARM.
2. ESTABLISH KOWAI RIVER TRACK FROM WAIMAKARIRI RIVER TO THIRTEEN MILE BUSH STREAM.
3. WITH COMMUNITY INVOLVEMENT, PLANT NATIVES AND ESTABLISH NETWORK OF TRACKS ON LEASED ECAN LAND THAT COMMUNITY CAN USE.

## GOAL 3:

IN STAGES, MOVE AWAY FROM DAIRY/ LIVESTOCK AGRICULTURE TO DIVERSE CROPPING/ HORTICULTURE WITH ECOLOGE AND OTHER ACCOMMODATION OPTIONS TO SUPPLEMENT INCOME.

### OBJECTIVES

1. START REGENERATIVE FARMING MODEL TO IMPROVE SOIL HEALTH. BEGIN REDUCING STOCK NUMBERS TO WHAT FARM CAN SUSTAIN WITHOUT BUYING IN FEED.
2. SEEK CORPORATE FINANCIAL SUPPORT FOR CONSERVATION WORK.
3. ESTABLISH TRAIL PLOTS OF FRUITS TO SEE WHAT COULD BE GROWN COMMERCIALY.

## VISION

### 10YEARS

IN 10 YEARS THE FIRST STAGE OF NURSERY PLANTING SHOULD BE WELL ESTABLISHED ON THE HILLSIDES OF DOC LAND, AROUND RIVER MARGINS AND AROUND ACCOMMODATION SITES. THE DAIRY HERD WILL BE REDUCED TO A NUMBER THAT CAN BE SUPPORTED YEAR-ROUND BY FEED GROWN ON FARM WITH OVER-ALL PROFITABILITY IMPROVING OR STABLE. SHELTER BELTS WILL BE ESTABLISHING AROUND THE ROAD BOUNDARY PROVIDING MORE SHELTER TO COWS AND SHOWCASING THE NATIVE PLANTING OCCURRING ON-SITE. ALL SPRING-FED WETLANDS WILL BE FENCED OFF AND NATIVE VEGETATION RE-ESTABLISHING. TRACKS WILL BE FORMED AND MAINTAINED AND OPEN TO LOCALS. LABOUR FOR THE INITIAL PLANTING AND MAINTENANCE WORK WILL BE BY TOURISTS IN EXCHANGE FOR BOARD UNDER SUPERVISION (LANDSCAPE ARCHITECT). SPRINGFIELD PRIMARY WILL ALSO BE INVOLVED IN "THE PRIMARY SECTION", PERHAPS THE FIRST LOCATION ON SITE THAT CONTACTS THE RIVER. TRIALS OF FRUIT TREES WILL NOW BE COMPLETE AND COMMERCIAL PLANTING OUT BEGINNING IN SELECTED AREAS.

### 50 YEARS

A RICH AND DIVERSE FARM LANDSCAPE, WITH PATCHES OF FRUIT AND CROPS GROWN ON THE BEST ARABLE LAND USING ORGANIC OR BIODYNAMIC METHODS. A TRACK (SURVEYORS TRAIL) WILL RUN ALONG THE KOWAI RIVER CONNECTING TO KOROWAI-TORLESSE TUSSOCKLAND PARK TO THE WAIMAKARIRI RIVER. OFF THIS, WILL RUN A NETWORK OF SMALL TRACKS ALONG THE FARM TERRACES WITH VIEWING STATIONS AT KEY LOCATIONS E.G. BIRDHIDES AT THE WETLANDS, TORLESSE VIEW, PORTERS VIEW ETC. SEVERAL ACCOMMODATION LODGES WILL BE LOCATED AROUND THE TOP TERRACE WITH INDIVIDUAL THEMES AND OUTLOOKS E.G RAILROAD COTTAGES, SKI HUTS, RANGERS RETREAT. VISITORS WILL BE ABLE TO PICK UP AN E-BIKE OR REGULAR PUSHBIKE WITH TRAILER FROM SPRINGFIELD RAILWAY STATION AND BIKE TO FARM, KEEPING THE BIKES FOR THE DURATION OF STAY AND USING THE TO EXPLORE THE AREA.

# Vision, Goals and Objectives

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

Concepts

# THE GRASS IS NOT GREENER : A DIFFERENT FUTURE FOR KOWAI PASTURES

## PROJECT NARRATIVE.

Kowai Pastures is at this point a typical Canterbury dairy farm. 550 cows Big mortgage, and big bills to pay for big inputs, feed, fertiliser, fuel, electricity ... big  
On the rocky slopes north of Bishop's Gully will be a predator proof sanctuary for skinks.

## Concluding Note

## References

Page 1

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Tree lined driveway

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Mara Hupara playground image

[https://www.google.com/maps/uv?hl=en&pb=!1s0x6d0d47b155a90b3b%3A0x546e52fd5fb78966!3m1!7e115!4shttps%3A%2F%2F5.googleusercontent.com%2Fp%2FAF1QipNGN\\_g6Ylh8mCr2oogAG-R5VFPmDGC85QmJmhl%3Dw209-h160-k-no!5smara%20hupara%20-%20Google%20Search!15sCAQ&imagekey=!1e10!2sAF1QipNGN\\_g6Ylh8mCr2oogAG-R5VFPmDGC85QmJmhl&sa=X&ved=2ahUKEwims935u5IAhUM3o8KHxsJB10QoiowDHoECAoQBg](https://www.google.com/maps/uv?hl=en&pb=!1s0x6d0d47b155a90b3b%3A0x546e52fd5fb78966!3m1!7e115!4shttps%3A%2F%2F5.googleusercontent.com%2Fp%2FAF1QipNGN_g6Ylh8mCr2oogAG-R5VFPmDGC85QmJmhl%3Dw209-h160-k-no!5smara%20hupara%20-%20Google%20Search!15sCAQ&imagekey=!1e10!2sAF1QipNGN_g6Ylh8mCr2oogAG-R5VFPmDGC85QmJmhl&sa=X&ved=2ahUKEwims935u5IAhUM3o8KHxsJB10QoiowDHoECAoQBg)

Page 5

Most plant images from Southern Woods website

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