

Coup

FARM PLAN

MARTIN AND WENDY COUP
80 PARAKOKO ROAD
ARIA

PLAN PREPARED BY:



IN PARTNERSHIP WITH:



2016

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FARM OVERVIEW

This Farm Plan is for Martin and Wendy Coup. It identifies farm-specific opportunities to manage your resources sustainably.

PROPERTY

The Pukeho Partnership property is 569.2 hectares running 5,794 stock units across an effective area of 548.0 ha (10.3 su/ha).

Eight different Land Use Capability (LUC) units and 6 dominant soil types were identified in the farm scale land resource survey. The LUC units range from versatile Class 3 flats to steep Class 7 hill country.

The hill country geology comprises of jointed and banded mudstone with patches of airfall tephra. The lower valleys and terraces are formed from alluvium.

The erosion present ranges from slight to severe with soil slip, gully, earthflow and streambank erosion present.

The property contour comprises approximately 14% flat to undulating land, 17% rolling to strongly rolling downlands, 60% moderately steep hill country, and the remaining 9% being steep to very steep hill country.



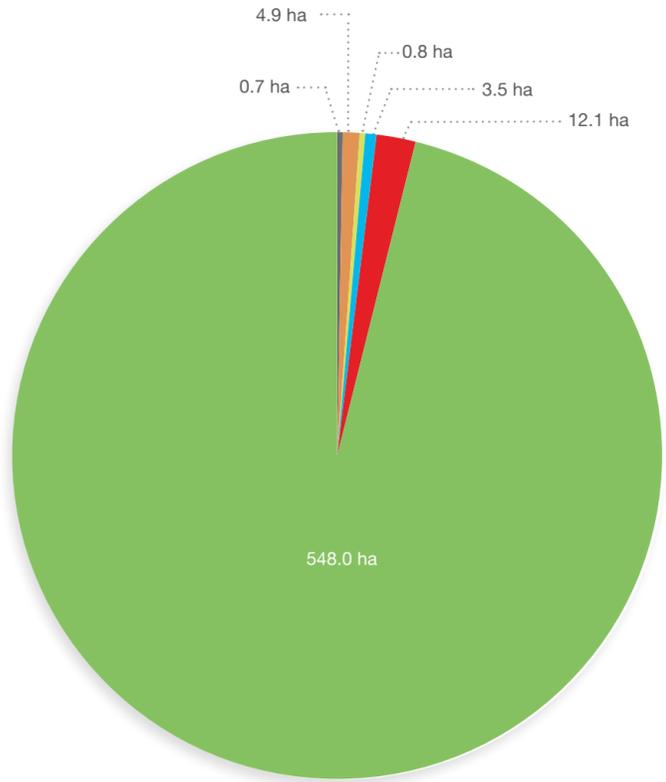
There were 5,891 stock units wintered to June 2015, with a stocking rate of 10.3 su/ha from an effective area of 548.0 ha.

SHEEP	JUNE 2015
Mixed age ewes	1,700
Two-tooth ewes	700
Ewe hoggets	820
Ram hoggets	50
Breeding rams	40
Sheep stock units	3,041

CATTLE	
Mixed age cows	120
Rising two year heifers	40
R1 heifers	78
R1 Bulls	340
Breeding bulls	8
Cattle stock units	2,850

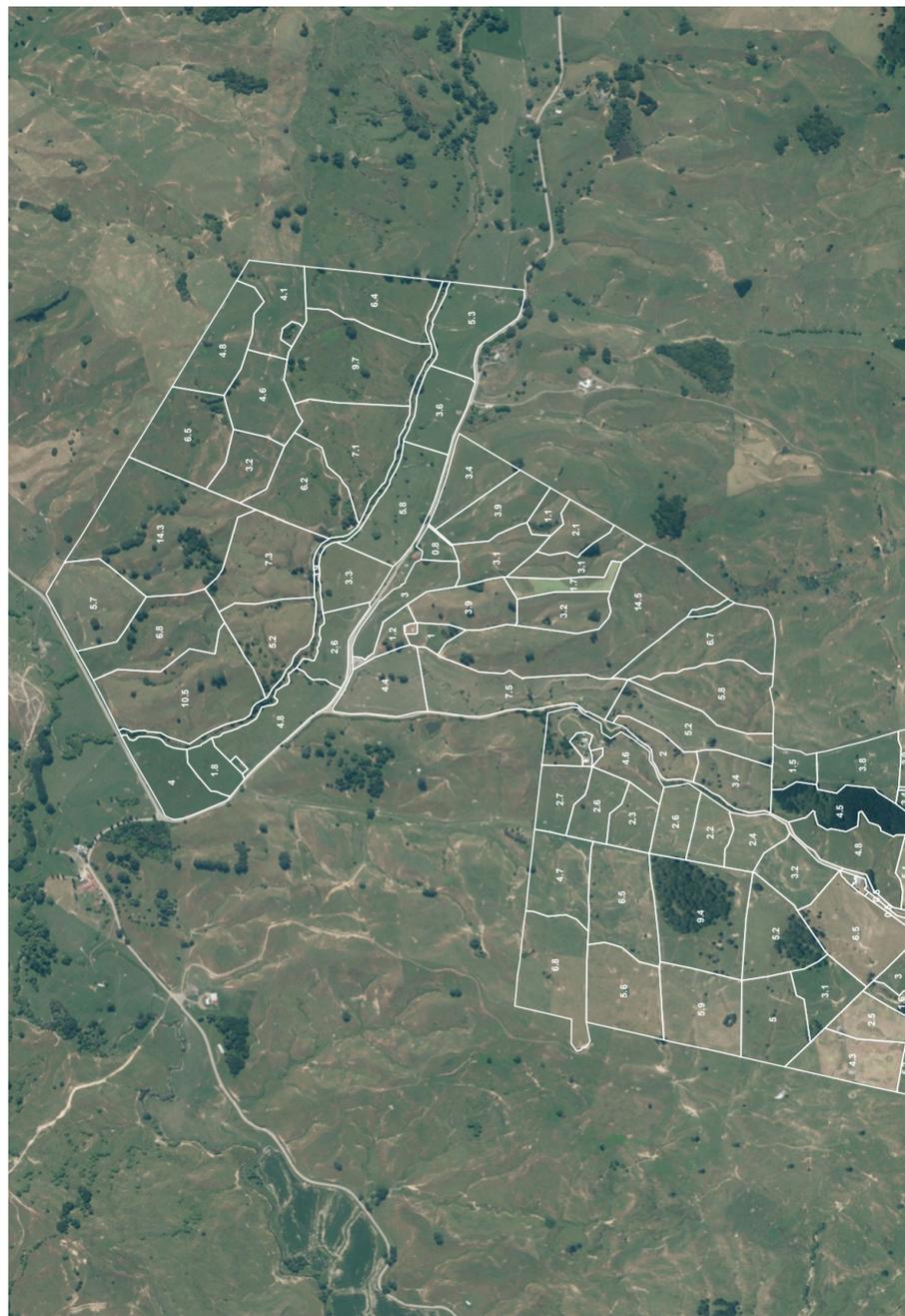
SUMMARY	
Total stock units	5,891
Sheep:cattle ratio	52:48
Stock units per ha	10.3

VEGETATION



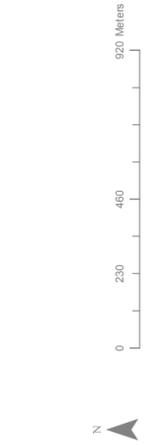
LEGEND:

- Improved pasture, Semi-improved pasture
- Indigenous bush and manuka
- Exotic conifer forest
- Rushes, sedges, wetland species
- Established riparian trees
- House grounds/woolshed yards



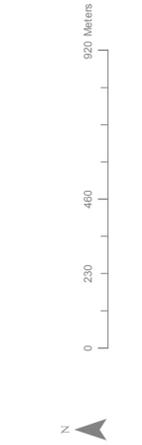
PADDOCK MAP
Upper Farm
Coup Farm
80 Parakakō Road
Araia

Drawn: Groundstock Limited
Date: May 2016



PADDOCK MAP
Lower Farm
Coup Farm
80 Parakakō Road
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Drawn: Groundstock Limited
Date: May 2016





LAND USE ASSESSMENT

This section analyses your land resource data gathered during our farm visit.

LAND RESOURCES

A land and soils survey has been undertaken at farm scale using the Land Use Capability (LUC) classification system. Current soil and LUC maps for this area have been mapped at regional scale (1:63,000) and are not relevant for farm scale LRI and LUC surveys (1:12,000).

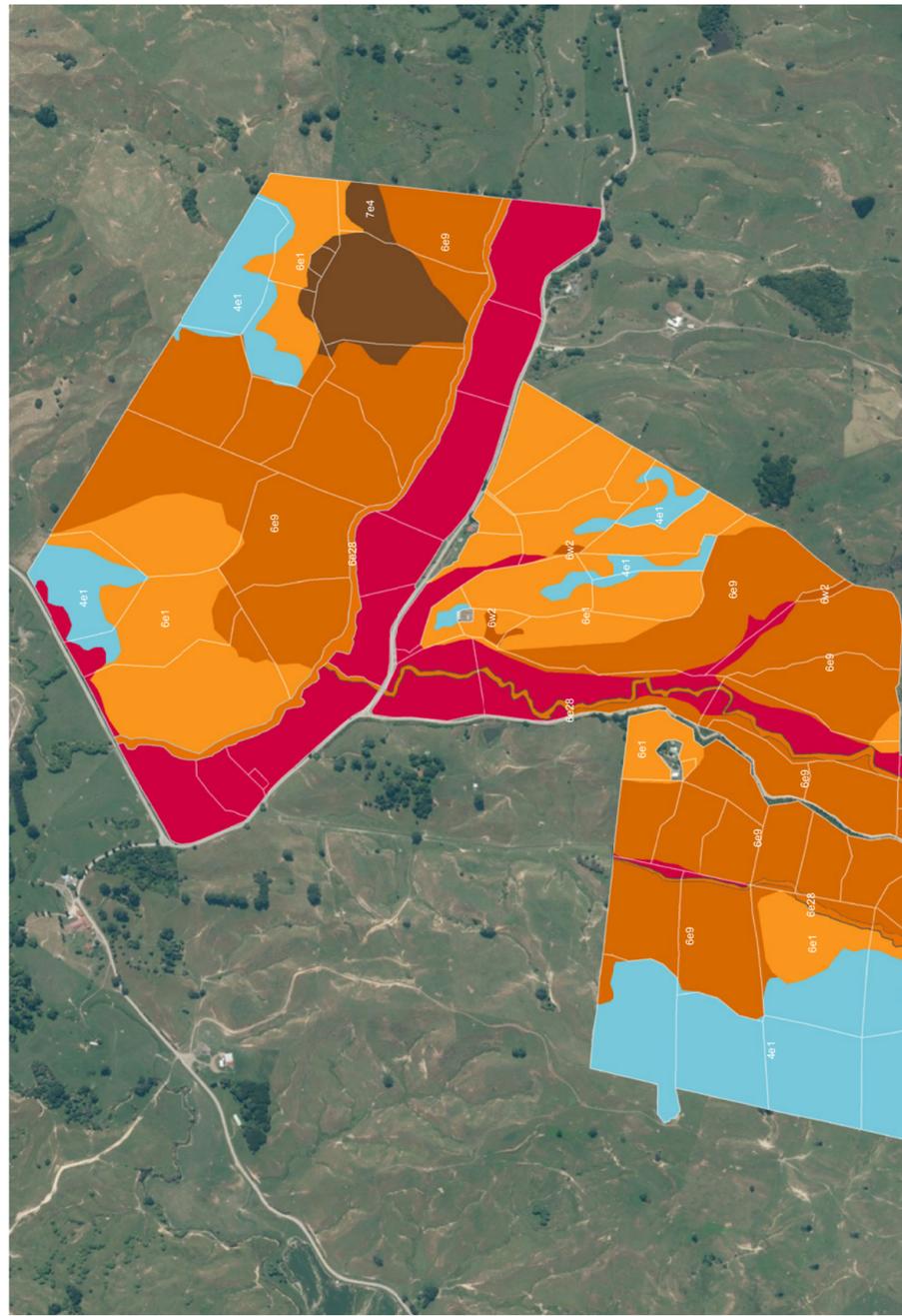
The Land Resource Inventory (LRI) is a systematic assessment system that divides the land into separate units based on the soil, geology, slope, vegetation and erosion potential. Once land units have been assessed using LRI the LUC system is used to classify the units based on their potentials and limitations.

The LUC system uses 3 components when classifying land. To illustrate this we can use LUC unit **4w2** as an example. The first numeral **4** is the land class (from 1-8: flat productive to steep non-productive); the second letter **w** indicates the land unit's major limitation from a subclass of four limitations: wetness (w), erosion (e), soil (s) and climate (c); and the final numeral **2** provides a regional land unit classification.

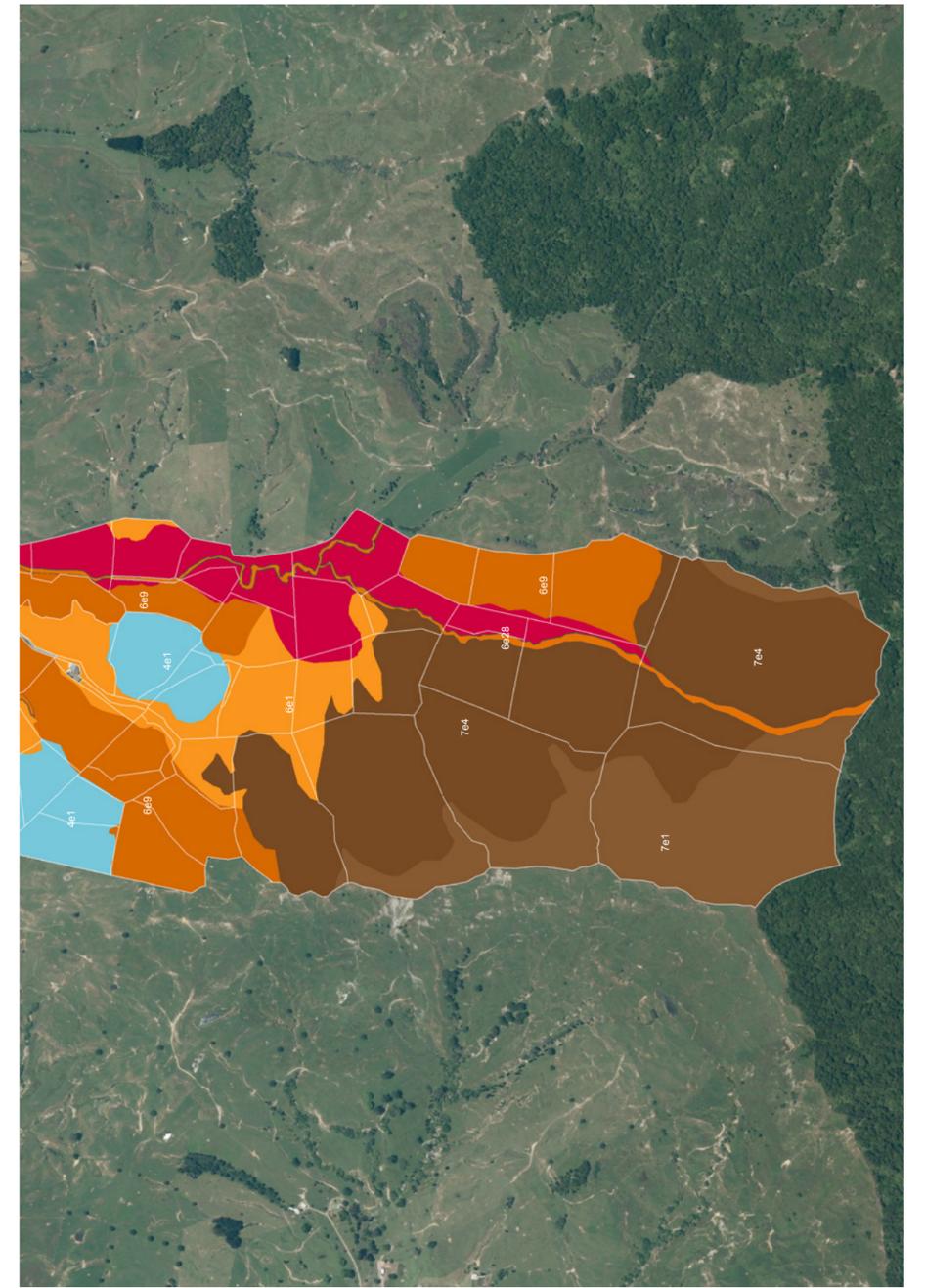
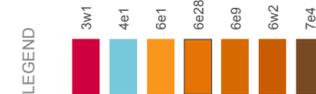
This systematic approach highlights current potential and limitations of different land units

and can also be used to match to a scientifically appropriate environmental mitigation measure if required.

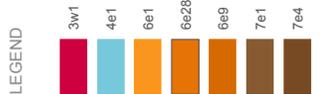
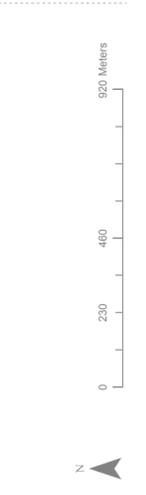
Based on this survey, and working with the farmer the following general recommendations for the land and water were formed and outlined in the Environmental Treatments section.



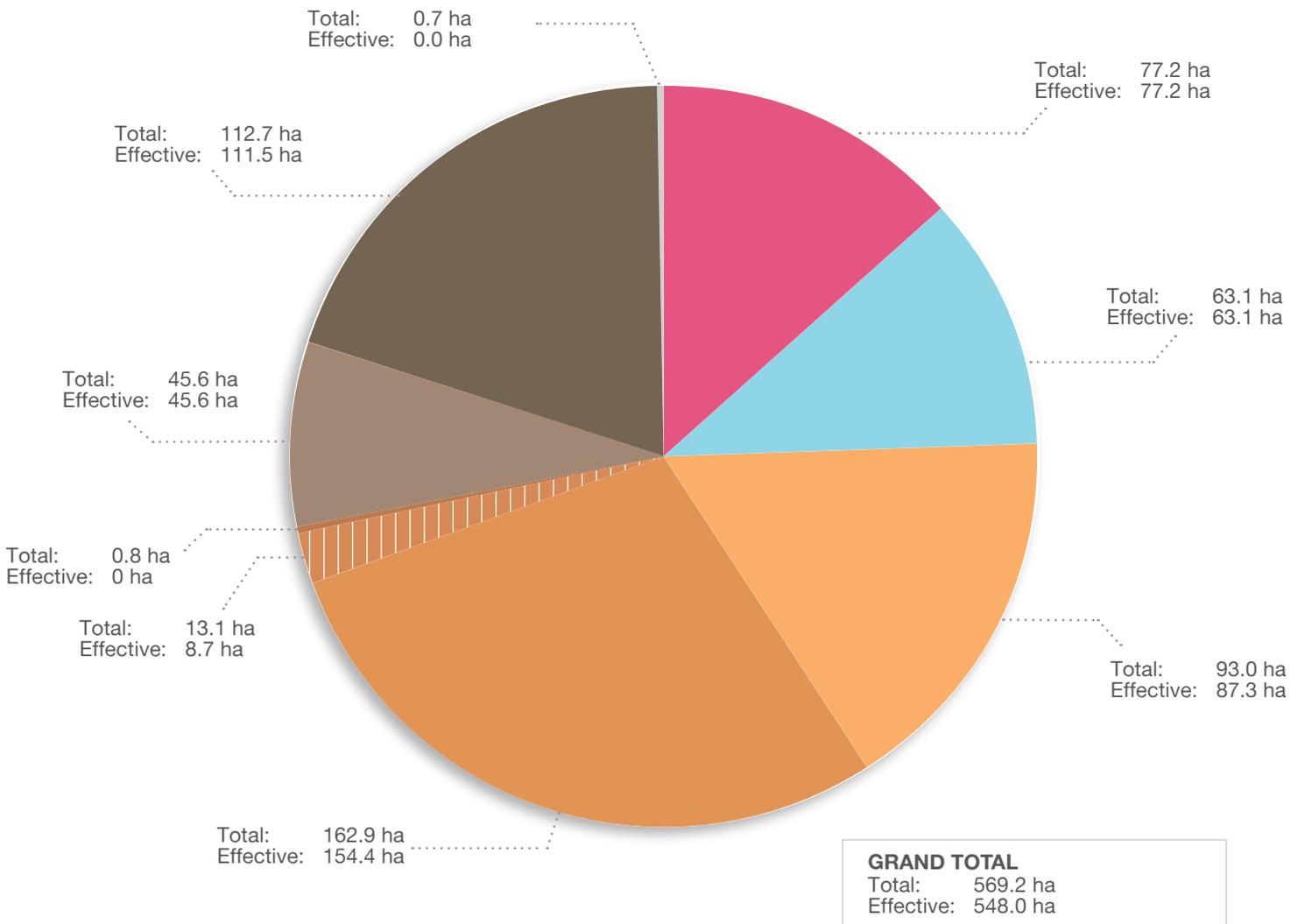
LAND USE CAPABILITY MAP
Upper Farm
Coup Farm
80 Parakoko Road
Aita



LAND USE CAPABILITY MAP
Lower Farm
Coup Farm
80 Parakoko Road
Aita



LAND USE CAPABILITY (LUC) UNITS



LEGEND:

CLASS 3	CLASS 4	CLASS 6	CLASS 7
3w1	4e1	6e1	7e1
		6e9	7e4
		6e28	House / yards
		6w2	

LUC UNIT DESCRIPTIONS

CLASS 3:

3w1 ■



Description

Narrow river terraces with a moderately high water table and subject to runoff from adjacent hills.

Erosion

Actual: Nil

Potential: Nil

Strengths

- > Reasonable natural fertility.
- > Generally summer safe.
- > Flat to undulating.
- > Potential for intermittent cropping following drainage.

Limitations

- > Wetness limitation even after drainage.
- > Wetness can delay crop planting and harvesting.
- > Weaker soil structure which is prone to treading damage by heavy cattle during wet periods.

Appropriate Land Use

- > Intensive pastoral production with drainage.

CLASS 4:

4e1 ■



Description

Strongly rolling slopes on yellow-brown loams with a moderate to severe erosion hazard when cultivated.

Erosion

Actual: Nil

Potential: Moderate to severe sheet and rill erosion when cultivated.

Strengths

- > Productive hill country unit.
- > Good soil physical properties.
- > Good drainage with soils resilient to pugging and treading damage.

Limitations

- > Prone to severe sheet and rill erosion if cultivated.
- > High phosphate retention soils.

Appropriate Land Use

- > Intensive pastoral production.

CLASS 6:

6e1 ■



Description

Moderately steep to strongly rolling slopes on yellow-brown loams over various lithologies.

Erosion

Actual: Nil to slight sheet and soil slip erosion.

Potential: Slight sheet and soil slip erosion.

Strengths

- > Productive hill country unit.
- > Good soil physical properties.
- > Good drainage where tephra is located.

Limitations

- > Prone to slight sheet and soil slip erosion.
- > High phosphate retention where tephra soils are present.

Appropriate Land Use

- > Intensive pastoral production.

6e9 ■



Description

Strongly rolling to moderately steep slopes on tertiary lithologies with a moderate potential for earthflow and gully erosion.

Erosion

Actual: Slight to moderate earthflow erosion. Nil to slight gully, soil slip and sheet erosion.

Potential: Moderate earthflow and gully erosion. Slight soil slip and sheet erosion.

Strengths

- > Productive hill country unit, north facing.
- > Higher natural fertility.

Limitations

- > Potential for moderate earthflow and gully erosion. Slight soil slip and sheet erosion.
- > Soils are prone to pugging and treading damage when wet.

Appropriate Land Use

- > Pastoral production with conservation measures, plantings.

6e28 



Description

Strongly rolling to steep banks found adjacent to stream and rivers.

Erosion

Actual: Nil to moderate streambank erosion.

Potential: Severe streambank erosion.

Strengths

> Good unit for increasing property biodiversity.

Limitations

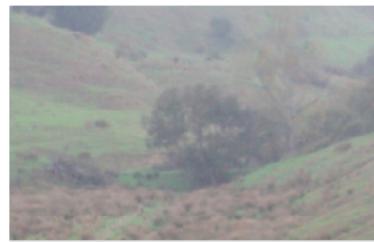
> Prone to severe streambank erosion.

> Weakly developed soils, prone to treading damage from cattle.

Appropriate Land Use

> Exclude cattle.

6w2 



Description

Flat to undulating swamps which have a continuing wetness limitation when drained.

Erosion

Actual: Slight sediment deposition.

Potential: Moderate deposition and slight streambank erosion.

Strengths

> Good biodiversity values.

> Contour provides some shelter.

Limitations

> High water table.

> Susceptible to treading damage from cattle when waterlogged.

> Wetness limitation remains even after drainage.

Appropriate Land Use

> Wetland

CLASS 7:

7e1 



Description

Steep slopes on tertiary sedimentary lithologies with 'mairoa ash' cover in places and a severe soil slip potential.

Erosion

Actual: Slight soil slip, sheet and gully erosion.

Potential: Severe soil slip and moderate sheet and gully erosion.

Strengths

> Productive hill country unit.

> Contour provides some shelter

Limitations

> Potential for severe soil slip and moderate gully and sheet erosion.

> Pasture production limited by insufficient soil depth due to slope.

Appropriate Land Use

> Pastoral production on lower slopes with conservation measures for stabilization.

7e4 



Description

Strongly rolling to steep very broken slopes on sedimentary lithologies with a severe earthflow and slump potential.

Erosion

Actual: Slight to severe earthflow and slump erosion. Slight to moderate gully erosion. Negligible to slight soil slip and sheet erosion.

Potential: Severe earthflow and slump erosion. Moderate gully erosion, soil slip and sheet erosion.

Strengths

> Productive hill country unit, north facing.

> Higher natural fertility.

Limitations

> Potential for severe earthflow and slump erosion. Moderate gully erosion, soil slip and sheet erosion.

> Soils are prone to pugging and treading damage when wet.

Appropriate Land Use

> Pastoral production with intensive conservation measures, intensive poplar plantings and dewatering.



ENVIRONMENTAL TREATMENTS

This section details the environmental issues identified on the property and the recommended treatments for best practice management.

ENVIRONMENTAL ISSUES

SLOPE STABILITY ON HILL COUNTRY

The moderate to steep hill country on the property with only slight to moderate earthflow and soil slip erosion can be controlled with space planted trees at 12 to 15 metre spacings up ephemeral waterways and over the erosion prone parts of the slope (see the orange space/gully plantings icons on the Recommended Treatments Map).



Start by planting up from the bottom of the slope or gully, working up the wetter ephemeral waterways.

Where indigenous trees and manuka have established on the steeper Class 6 and 7 hill country, they should be left to regenerate as a cheap form of soil conservation.

A total of 625 poles are required for stabilising the gully systems and steeper slopes on the property.

GULLY EROSION

Gully erosion is the removal of soil or soft rock material by water, forming distinct narrow channels, which usually carry water during and immediately after rains.



Where there is adequate soil depth, the gully erosion can be controlled by pair planting poplar and willow poles at 10-12 metre intervals in the gully system in order to slow the flow of the water.

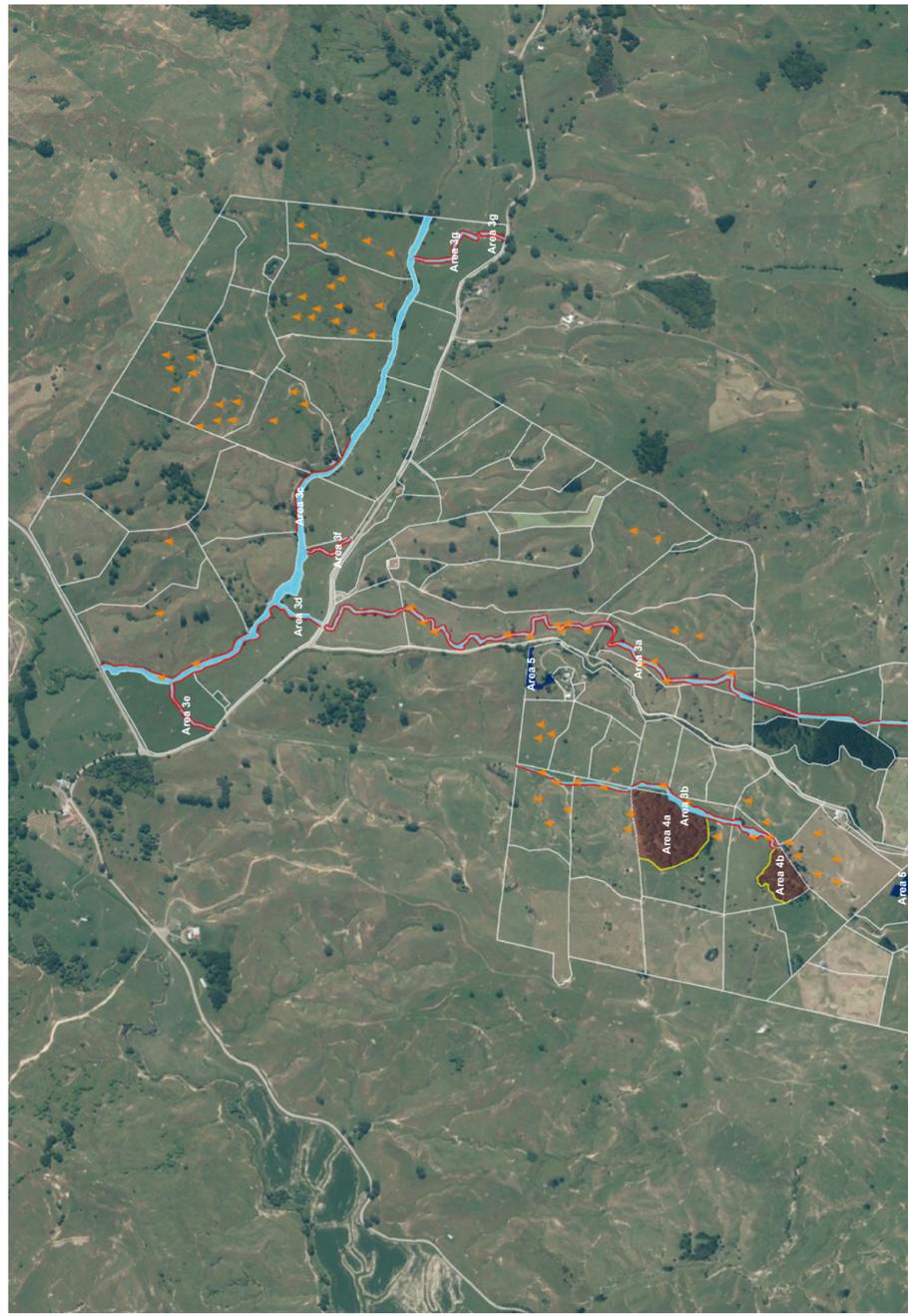
A total of 300 poles are required for stabilising the gully systems and steeper slopes on the property (see orange space/gully plantings icons on the Recommended Treatments Map).

SOIL HEALTH

The soils of LUC unit 3w1 found in the narrow gullies are formed from fine textured alluvium.



These soils are weakly developed and are prone to pugging and treading damage from heavy cattle when wet. Care is needed when farming these soils to minimise the risk of treading damage during wetter periods. A significant pugging event can drastically reduce pasture productivity.

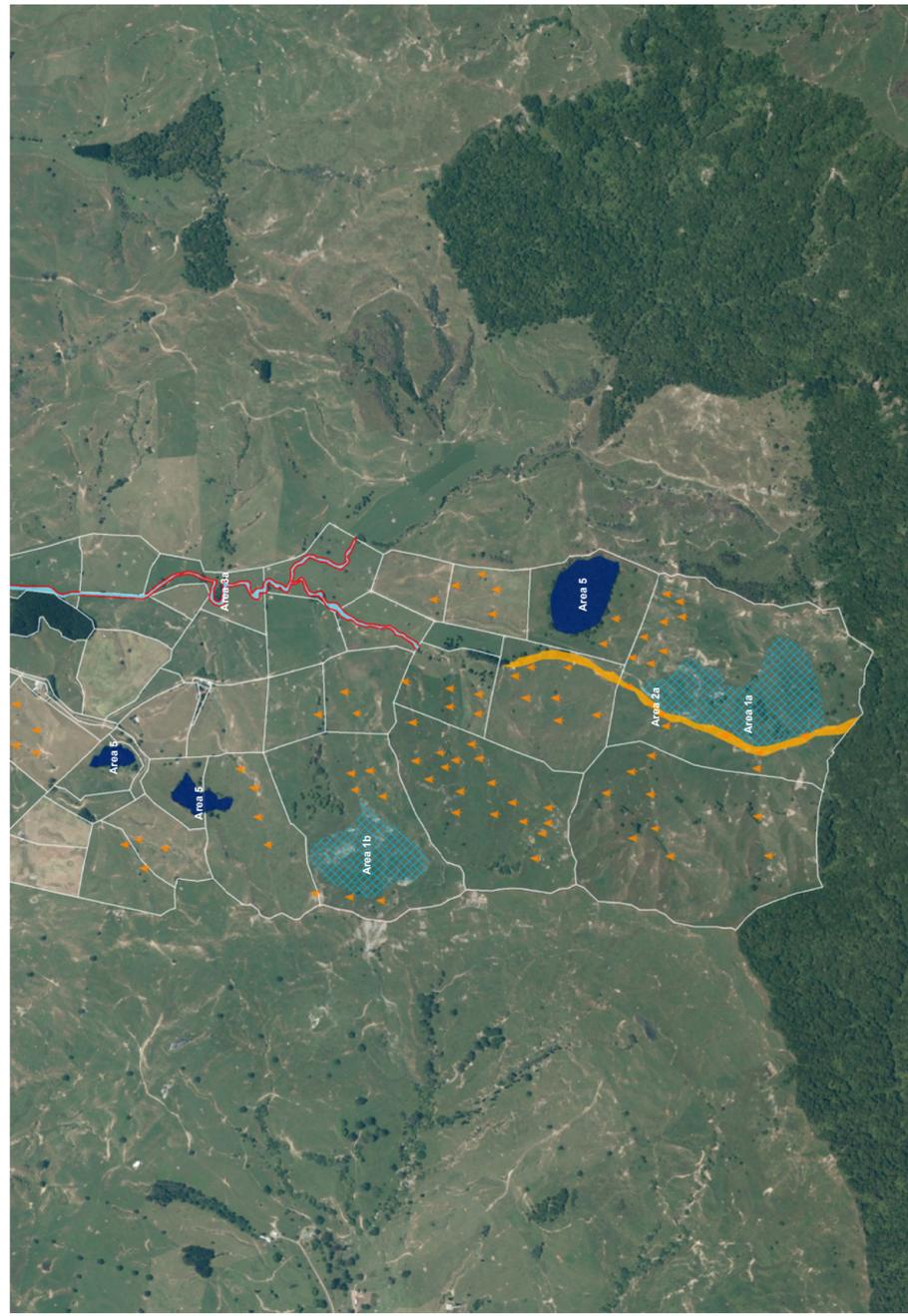


RECOMMENDED TREATMENTS

Upper Farm
Coup Farm
80 Parakoko Road
Aria

Drawn: Groundstock Limited
Date: May 2016

- LEGEND
- ▲ Space/Gully plantings
 - Bush retirement
 - Riparian retirement
 - ▨ Bush retirement
 - ▩ Earthflow/Slump stabilisation
 - Gully stabilisation
 - Regeneration
 - Riparian retirement



RECOMMENDED TREATMENTS

Lower Farm
Coup Farm
80 Parakoko Road
Aria

Drawn: Groundstock Limited
Date: May 2016

- LEGEND
- ▲ Space/Gully plantings
 - Bush retirement
 - Riparian retirement
 - ▨ Bush retirement
 - ▩ Earthflow/Slump stabilisation
 - Gully stabilisation
 - Regeneration
 - Riparian retirement

RECOMMENDED TREATMENTS

AREA 1A & 1B
EARTHFLOW/SLUMP STABILISATION

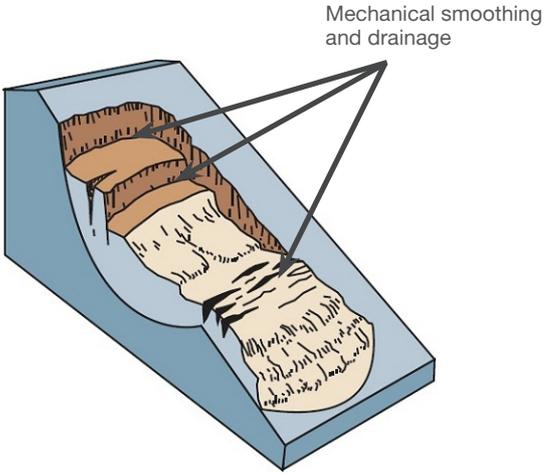


There is moderate and severe earthflow and slump erosion occurring across Area 1a and 1b as part of the more extensive earthflow/slump complex situated at the back of the property. Area 1a has a Paraheka Stream tributary situated at the bottom of the slope which is also currently undermining slope stability and is contributing to the malformation of this area.

A practical way to stabilise these areas requires a combination of mechanical smoothing, dewatering and intensive space planting of willows or poplars. Allow continued scrub reversion along the stream banks, up gullies or where soils are too skeletal for poplar/willow pole establishment.

Where possible, tension cracks or areas of pooled water (especially below the head scarps) should be smoothed and drained as it is critical to prevent water pooling and lubricating the slip or tension planes. Any natural or manmade dams in these areas should also be drained.

Targeted intensive space planting (350 poles) should be undertaken along the toe of the slope (adjacent to the stream) below the head scarps



and up the wetter ephemeral drainage channels at 10m spacings or where soil depth permits.

Intensive pole planting has been undertaken on Area 1b; mechanical smoothing and dewatering is recommended.

Due to the location, restricted access and the amount of poles required for Area 1a and 2a, a pole drop by helicopter is recommended.

AREA 2
GULLY STABILISATION



Area 2 has moderate and severe gully erosion present. Water has eroded distinct narrow channels that continue to undermine slope stability.

Where there is no vegetation and adequate soil depth, the gully erosion can be controlled by planting poplar or willow poles at 5-10 metre intervals in the gully system (62 either side, totalling 125). Where soil is too skeletal for willow pole survival allow natural re-vegetation.

AREA 3A-3G
RIPARIAN RETIREMENT



Area 3a-3g consists of 10.4 ha of unfenced eroding river and stream riparian margins.

To enhance the stability of the river/stream banks and improve water quality, stock should be excluded from these riparian areas with 10.6 km of fencing and the further planting of 125 shrub willows along river and stream pressure points (see Recommended Treatments Map for locations).

These riparian margins can be grazed for weed control purposes with sheep.

See table below for the fencing required for each area:

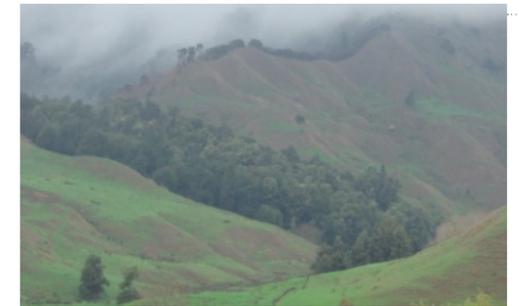
Area	Fencing (metres)
3a	7300
3b	1190
3c	450
3d	380
3e	220
3f	340
3g	720
Total	10600

AREA 4A & 4B
BUSH RETIREMENT



Area 4a (4.1 ha) and 4b (1.4 ha) consists of maturing indigenous bush that provides slope stabilisation and biodiversity values. These areas should be left to fully regenerate and retired from the pastoral system with 610m (Area 4a: 340m, Area 4b: 270m) of stock proof fencing.

AREA 5
REGENERATION



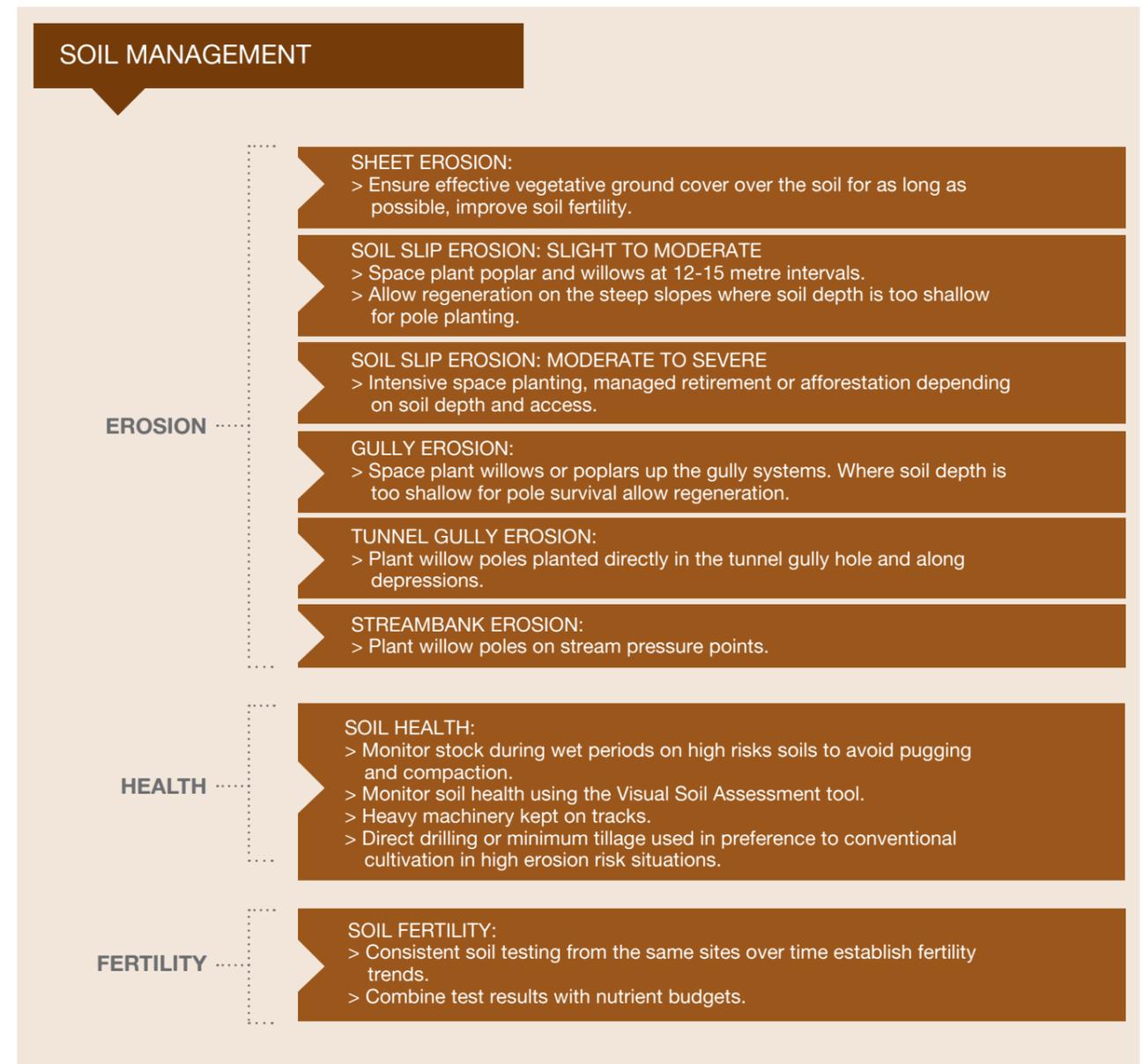
Area 5 (5.9 ha) consists of small areas of bush and scrub located on steep erosion prone slopes. These areas are generally impractical to fence off from stock but provide slope stability for LUC Class 6 and 7 land. These areas should not be cleared but allowed to regenerate providing a cheap form of soil conservation.

RECOMMENDED TREATMENTS SUMMARY

TREATMENT TYPE	QUANTITY
Earthflow stabilisation	350 poplar poles
Gully stabilisation	125 willow poles
Riparian retirement	10.4 ha, 10.6km stock proof fencing
Bush retirement	5.5 ha, 610m stock proof fencing
Regeneration	5.9 ha
Spaced poplar plantings	625 poplar poles
Gully planting	300 poplar/willow poles

ENVIRONMENTAL BEST PRACTICE

This section provides farmers with practical descriptions of techniques, measures or actions that they can implement to mitigate environmental issues.



WATER MANAGEMENT

QUALITY

POINT SOURCE CONTAMINANTS:

- > Fence and exclude cattle from streams and waterways where practical.
- > Ensure runoff from yards is not directed into waterways.
- > Ensure refuse tips and ofal pits are sited away from streams and above water tables where there is no risk of contamination to groundwater.
- > Use specific dosage as preference over dipping stations.
- > Avoid fertiliser near waterways.
- > Culvert or bridge main farm tracks.
- > No runoff of leachate from silage pits to waterways including drains.

NON POINT SOURCE CONTAMINANTS:

- > Develop riparian strips on permanent waterways.
- > Maintain good pasture cover.
- > Grazing management - breakfeed toward waterways with crops.
- > Utilise farm nutrient budgets.
- > Ensure correct timing of fertiliser applications.

- > Minimum or no-till cultivation techniques used when high risk of run-off from cultivated blocks.
- > Leave a minimum 3m wide uncultivated margin along streams in winter feed paddocks. If stream is unfenced, use a single hotwire to prevent cattle access and maintain the vegetated strip.

BIODIVERSITY

MANAGEMENT

NATIVE BUSH:

- > Exclude stock from grazing where possible.
- > Shoot deer and goats.
- > Shoot and poison possums.

POPLAR AND WILLOW POLES:

- > Form prune trees for future management.

TRACKS

MANAGEMENT

STORM WATER:

- > Maintain track water tables.
- > Ensure track water discharged onto stable ground.
- > Maintain culverts and track crossings.

APPENDIX

SOIL LEGEND

SOILS OF THE LOWLANDS



Soil 1

LUC map symbol: 1

Parent material: Alluvium.

Drainage status: Poorly to imperfectly drained.

Texture: Silt loam over clay loam

The soil has slow permeability, a high water table and is located in the narrow valleys and is subject to runoff from hills. This alluvial soil has a weak topsoil structure and is prone to trading damage from cattle when wet.

Management considerations: High susceptibility for pugging, avoid grazing with heavy cattle during wet periods.



Soil 2

LUC map symbol: 2

Parent material: Alluvium.

Drainage status: Very poorly drained.

This soil has very poor drainage and is not suited to pastoral farming.

Management considerations: This soil is very weakly developed and very poorly drained, exclude stock from these areas where possible.



Soil 3

LUC map symbol: 3

Parent material: Volcanic tephra

Drainage status: Moderately to well drained.

Texture: Fine sandy loam over loam.

Located on the easy rolling downlands, this soil has a deep topsoil profile and a higher P retention than the alluvial soil. A better soil than 1 and two for wintering cattle on.

Management considerations: Care with cultivation to avoid sheet and rill erosion. This soil has a low vulnerability to water logging and tread damage from cattle when wet

SOILS OF THE EASY TO STEEP HILL COUNTRY



Soil 4

LUC map symbol: 4

Parent material: Volcanic tephra.

Drainage status: Well drained.

Texture: Fine sandy loam

This volcanic tephra soil is found throughout the moderately steep to steep hill country overlying limestone, mudstone and greywacke lithologies.

This soil has similar physical qualities to Soil 3 but with a shallower topsoil due to increased slope factors. This soil has high P retention due to iron oxides present in the tephra, and a lower natural fertility.

Management considerations: Good soil for wintering cattle on due to topsoil development and drainage.



Soil 5

LUC map symbol: 5

Parent material: Jointed mudstone.

Drainage status: Imperfectly drained.

Texture: Silt loam over clay loam

Located throughout the property this soil is does not have a mantle of volcanic tephra and is particularly prone to pugging and treading damage from cattle during wet periods.

Management considerations: Care with heavy stock during wet periods. Prone to earthflow and soil slip erosion, space plant poplars or willows up ephemeral waterways and on erosion prone parts of slope.



Soil 6

LUC map symbol: 6

Parent material: Banded Mudstone

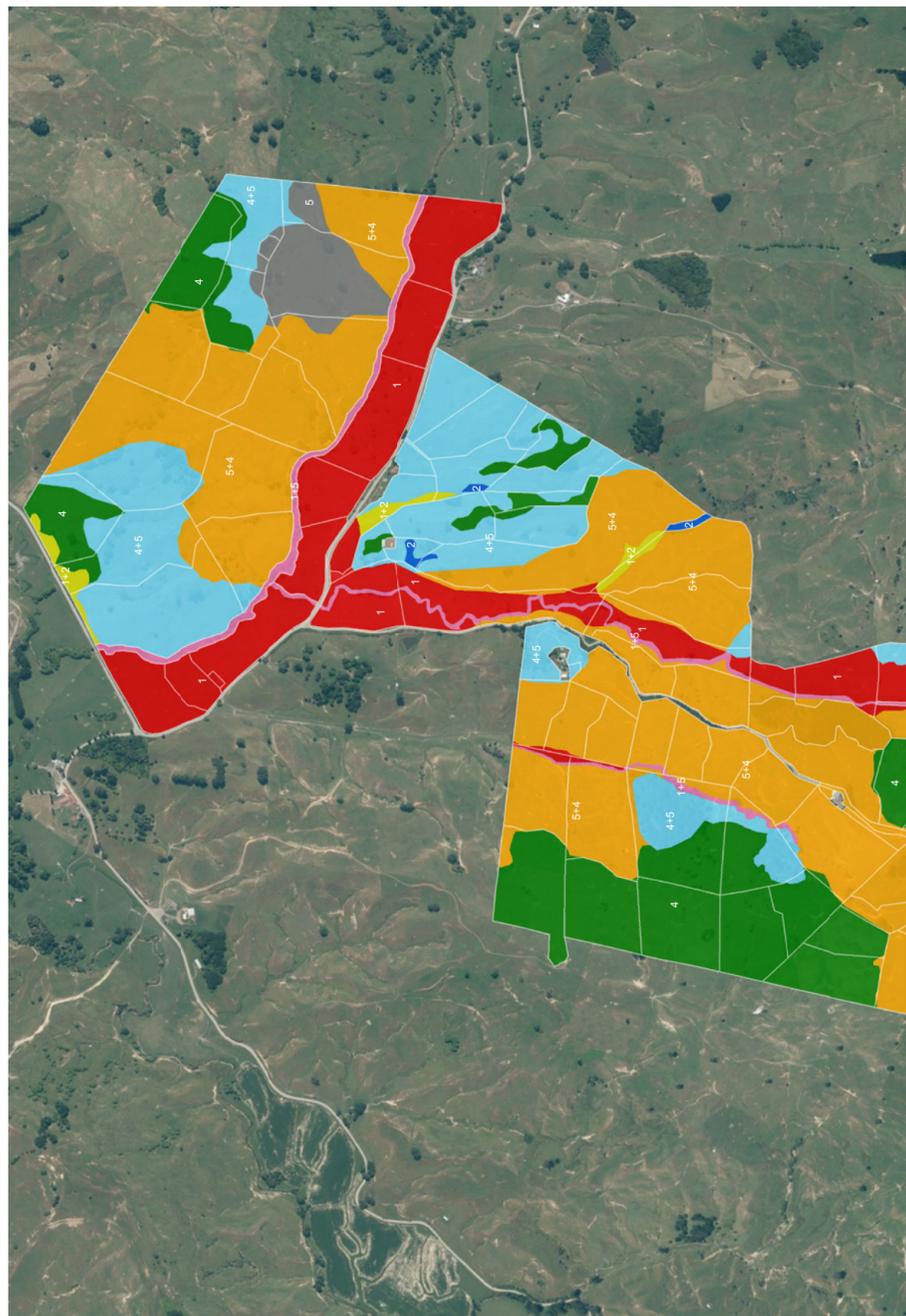
Drainage status: Moderately well drained.

Texture: Silt loam.

This soil is located throughout the steeper hill country at the back of the property, it is prone to

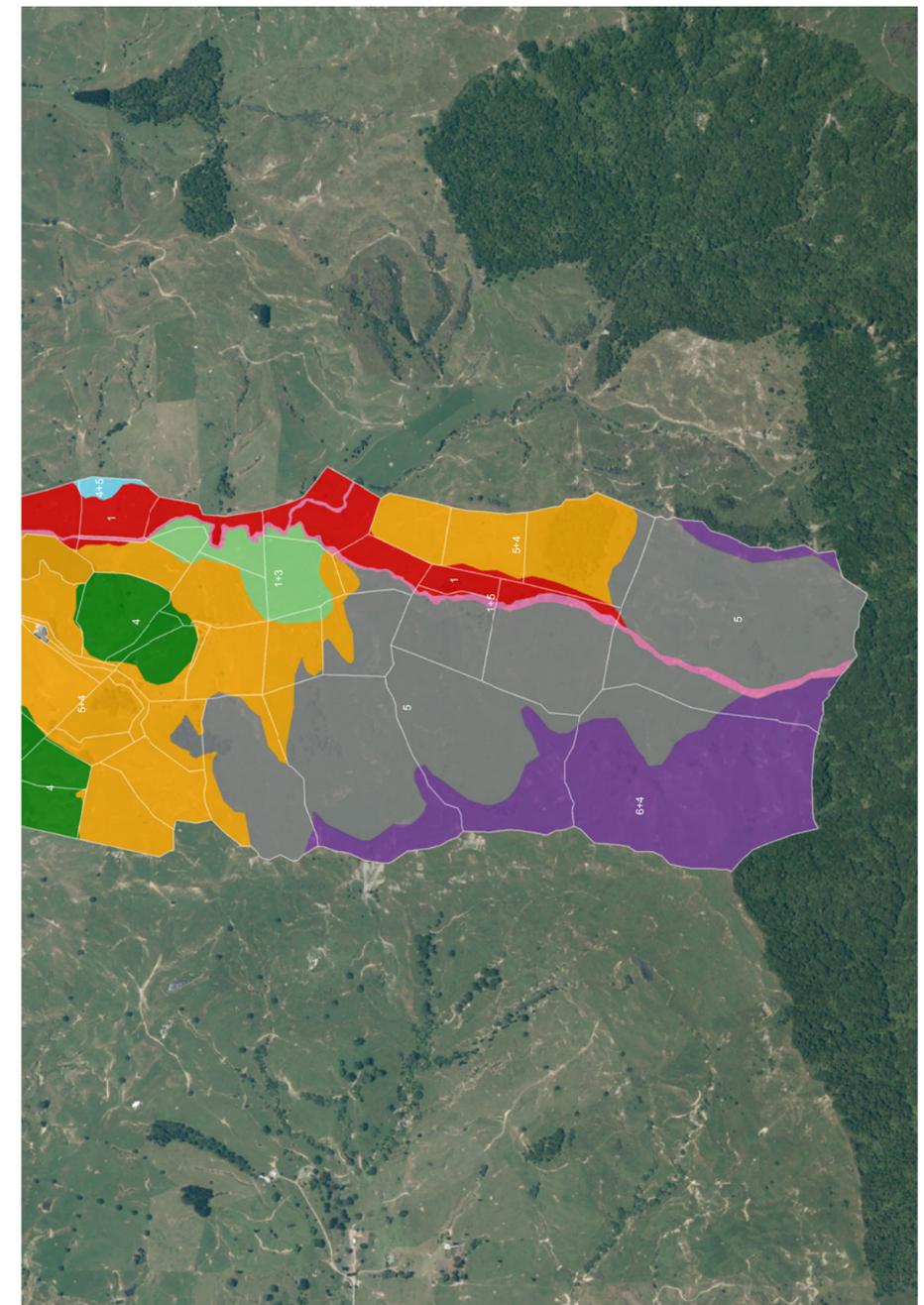
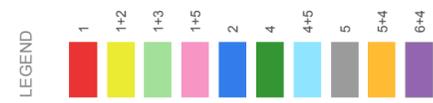
soil slip erosion and unlike Soil 5, topsoil depth is more skeletal.

Management considerations: Has a low natural fertility but responds well to fertiliser.



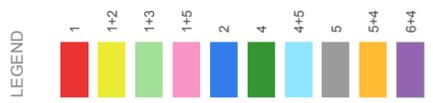
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SOIL MAP
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SOIL MAP
Lower Farm
Coup Farm
80 Parakoko Road
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MARTIN AND WENDY COUP 80 Parakoko Road
Aria

P 07 877 7885

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