

Awatea Forest Fund

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Te Koawa Station (Feasibility Study)

February 2022



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3 February 2022

1. Introduction

Client and propose

This report has been prepared for Roger Dickie (N.Z.) Limited (**RDNZ**). The purpose of this feasibility study report is to review the input assumptions applied in the financial model provided by RDNZ and its forest manager, Forest Management New Zealand Limited (**FMNZ**). The input assumptions reviewed by PF Olsen Limited (**PF Olsen**) for this feasibility study include:

- Mapping quality;
- Yield projections;
- Production cost assumptions - harvesting and cartage;
- Forestry cost assumptions;
- Log price and market assumptions; and
- New Zealand Emissions Trading Scheme (NZETS) assumptions for the plantation development.
- Estimate the impact on IRR of any revised input assumptions.
- Evaluate the sensitivity of returns to key project assumptions.

This feasibility study is intended to assist RDNZ in acquiring the Te Koawa Station. The Te Koawa Station project includes:

- A land purchase and afforestation opportunity with NZETS eligibility of the property at 1131 Whakarau Road, Otoko, in the Gisborne region of New Zealand.
-

Information relied on

In preparing this feasibility study, PF Olsen has relied on:

- The information of the property provided by RDNZ and the vendor;
- RDNZ's Emissions Trading Scheme Report for the current NZETS status of the Te Koawa Station;
- FMNZ's local knowledge of costs of contractual forest operations;
- The area information (GIS data) provided by FMNZ;
- FMNZ's knowledge of the resource and region;
- The financial model provided by RDNZ on 12 October 2021; and
- The assumption that formal easements will be established over the land for access and forest roading in the Te Koawa Station; and
- Logan Stone's land valuation report as at 17 January 2022.

PF Olsen has not conducted independent investigations to verify the property information, including title area, plantable areas, improvement values of the property, and the values of other facilities or improvements provided by the vendor, RDNZ, and FMNZ.

Business structure

RDNZ intends to set up the Awatea Forest Fund (AFF) as a Portfolio Investment Entity (PIE) for passive investment.

The proposed business structure is to set up FMNZ as the lessee of the land owned by AFF and pay AFF lease payment at the time of harvest. AFF still technically owns both of the freehold land and tree crop. According to the Deed of Lease between AFF and FMNZ, the lease payment paid by FMNZ will be calculated (inclusive of GST) as:

- **Lease Payment to AFF** = (Gross Revenue – Production Costs) x **95.75%**

FMNZ will retain the remaining 4.25% of the lease payment as a harvest management fee.

Despite a forestry right agreement already been in place, the tree crop is technically still planted on freehold land. As a result, PF Olsen will value the tree crop in this valuation as on freehold land.

2. Resource descriptions

Introduction

The Te Koawa Station is situated in the Gisborne District of New Zealand (Appendix 1).

Property information

Details of the certificates of title are summarised in Table 1.

Table 1: Summary of the Certificates of Title

Vendor	Title No.	Description	Title Area (ha)	Rates (excl. GST)
R G Wishart & M W Wishart	GS3B/224	Part Poututu C4 Block	26.7884	1,362
	GS5C/581	Section 1 Block XIII Mangatu SD	575.9153	10,877
Total			602.7037	12,240

Source: Information Memorandum (Bayleys, 2021), Gisborne Regional Council

Forest description

The Te Koawa Station consists of planted and plantable greenfield areas. Some of the planted areas have been registered under the NZETS. Table 2 summarises the current status and future afforestation plan for the property. Detailed forest descriptions are presented in Appendix 2.

Table 2: Resource descriptions – Te Koawa Station

Resource type	Species	Planted year	NZETS type	Timber harvest	Plantable area (ha)
Existing plantings:					
Planted – existing	Various	Various	Permanent	No	56.5
Planted – existing	Radiata pine	1990-91	Averaging (to Permanent)	No	30.2
Planted – existing	Radiata pine	2017	Pre-1990	Yes	16.5
Future plantings:					
Plantable – greenfield	Radiata pine	2022	Averaging	Yes	140.0
Plantable – greenfield	Radiata pine	2022	Permanent	No	169.7
Plantable – greenfield	Redwood	2022	Permanent	No	50.0
Total plantable					462.9

Source: RDNZ and Bayleys

Productivity

The national productivity index layer developed by Scion for radiata pine, 300 Index, has been used to predict site productivity. Appendix 3 shows the 300 Index for radiata pine ranges between 30.0 and 35.0 m³ per hectare per annum. This indicates the site productivity of the Te Koawa Station is relatively good and above the national average.

NES-PF

The National Environmental Standard for Plantation Forestry (NES-PF) are regulations made under the Resource Management Act that came into effect on 1 May 2018. Under the NES-PF (Appendix 4), the Te Koawa Station has been categorised from “Low” to “High” erosion susceptibility, to “Very High” and “very High 8e”. Hence, resource consent will be required for for mechanical land preparations, afforestation, and earthworks on a slope of 25° or more (especially on the areas categorised as “Very High” and “Very High 8e”).

Forest inspection

PF Olsen undertook a forest inspection on 13 October 2021. The objectives of the inspection were to:

- Observe the site conditions.
- Identify any issues with the afforestation plan.
- Validate forest development and harvesting cost assumptions for bareland area.
- Determine the feasibility of the proposed afforestation areas planned for future commercial harvesting and permanent carbon.
- Understand access requirements and/or restrictions.

Observations from the field inspection in October were:

- The land was generally clean, being well grazed, with little in the way of scrub or existing vegetation. Hard grazing prior to planting will be the only land preparation required for the majority of the area.
- Some areas of scrub on the Southern side of the river have been sprayed for planting through but are likely to require some line cutting or other intervention.
- Access to the property on the South side of the river is via a narrow swing bridge or crossing the river in suitable off-road vehicles during low flow. This will add cost to establishment (e.g. flying in tree stocks) and makes harvesting difficult and potentially financially marginal. Some significant engineering would be required either using a bridge or kilometres of roading through a neighbouring property. However, as a lot of this area is red zone, consents would be required for either of these options and there is no guarantee of this being granted.
- Infrastructure was limited on the South side, tracks navigable only by motorbikes and side-by-sides (especially in winter). Tree stocks may need to be flown into the Southern portion of the property.

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- The mature pine on the northern side of the river is either not feasible to harvest due to environmental concerns or marginal from an economic perspective.
- An area of 30 ha which was earmarked for harvest is cut off from the adjacent road by low hanging powerlines. Alternative access would be via a new expensive road that would only allow 7 to 10 hectares of harvest (probably a breakeven exercise).
- Topography on the north side of the river is not too steep, with about 30 to 40 percent of the plantable area expected to be harvestable using ground-based harvest systems.
- Access for planting and future harvesting on the North side of the river is feasible from a public road.

Photos from the field inspection are presented in Appendix 5.

**Area
adjustments**

PF Olsen reviewed the plantable and NZETS eligible GIS layers provided by RDNZ/FMNZ. No adjustment has been made to the plantable area provided by FMNZ/RDNZ, except the 16.5 ha of radiata pine planted in 2017 which PF Olsen has applied a -13.5% adjustment, based on the difference between gross area and planted area usually between 10% and 15% in New Zealand.

3. Inventory and Growth & Yield model

Growth & Yield model

Existing plantings

The vendor provided pre-harvest inventory (PHI) data from sample plots measured in September 2021 by an independent contractor for the existing planted area (*for stands that were planted in 1990, 1991, 1993, and 2001*). Some of these stands were originally planned to be harvested for log revenue. However, the roading construction cost and access to some of these stands are considered to be uneconomical for a relatively small area. These stands, which are currently registered in the NZETS, are now planned not to be harvested, and will be converted to permanent carbon forests.

Future plantings

Forecaster modelling software (version 2.2.1.1553) has been used to estimate log yields for the new plantings in 2022. Two silvicultural regimes were modelled in Forecaster:

1. Production forests: plant initial stocking at 833 stems per ha, waste thinning to 550 stems per ha at age 9; and
2. Permanent forests (radiata pine): plant initial stocking at 1,100 stems per ha, waste thinning to 700 stems per ha at age 9.

Model and site settings can be found in Appendix 6. In our view, these settings are appropriate for estimating future radiata pine log yields at Te Koawa Station. Validation of the outputs generated from these settings was carried out by comparing to similar existing or recent harvested forests in the region.

Cutting strategy The cutting strategy applied in Forecaster is summarised in Table 3.

Table 3: Cutting strategy in Forecaster

Grade	Min Small End Diameter (SED) (cm)	Max Branch Size (cm)	Length (m)	Description
P40	42	0	4.4, 5.0	Large pruned log
P35	37	0	4.4, 5.0	Small pruned log
A	33	12	4.0, 6.0	Large sawlog
K	24	12	4.0, 6.0	Small sawlog
KI	26	25	4.0	Industrial log
KIS	14	No limit	4.0	Small Industrial log
Pulplog (Domestic)	10	No limit	3.7-8.1@1m	Domestic pulplog

Yield table
analysis

For the new plantings, PF Olsen has compared the yield tables generated in Forecaster with the MPI Gisborne regional yield tables, PF Olsen’s actual harvest operations in the region, and the PHI data provided by the vendor collected from the mature stands.

The results of the yield table analysis are presented in Appendix 7

Yield table
assumptions

PF Olsen applied some adjustments to the Forecaster outputs, based on our yield table analysis results in Appendix 7. The adjusted yield tables applied in this feasibility are presented in Figure 1.

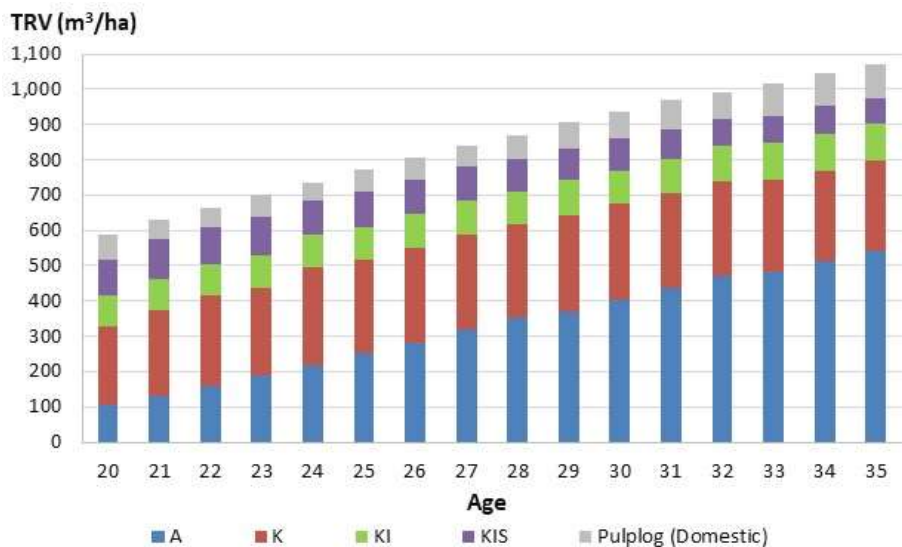


Figure 1: Yield table for new plantings (framing – unpruned)

4. Cost assumptions

Introduction

The cost assumptions applied in this review have been divided into three categories: production, forestry, and general overheads.

Production costs (roading)

Road construction cost refers to construction of harvesting roads and skid formation, while road maintenance cost refers to the road maintenance cost during harvest operations.

The roading cost estimated by RDNZ/FMNZ in October 2021 are presented in Table 4. PF Olsen has revised the assumptions derived by RDNZ/FMNZ in this feasibility study based on our observations from our field inspection and our experience in the region.

Table 4: Roading Construction and Maintenance Cost Assumptions

	Road construction (\$/ha)	Road maintenance (\$/m ³)
RDNZ/FMNZ assumptions:		
Existing planted area – 1 st rotation	8,000	2.00
New planting area – 1 st rotation	6,000	2.00
Te Koawa Station feasibility study:		
Existing planted area – 1 st rotation	Not harvested	
New planting area – 1 st rotation (Incl. the 2017 planting)	8,000	2.00

Production costs (harvest & load)

Log and load costs relate to the felling, extraction, processing and loading of logs.

The harvesting cost assumptions derived by RDNZ/FMNZ in October 2021 are summarised in Table 5. These estimates are very similar to the ones derived by PF Olsen. Therefore, PF Olsen has opted to adopt the percentage of hauler-based and ground-based area, and unit rates assumptions provided by RDNZ/FMNZ in this feasibility study.

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Table 5: Harvest cost assumptions

	Hauler-based	Ground-based	Hauler-based	Ground-based	Area weighted average rate
	(\$/m ³)	(\$/m ³)	%	%	(\$/m ³)
<i>Existing planted area (1st rotation):</i>					
RDNZ/FMNZ	47.00	35.00	100%	0%	47.00
<i>Greenfield new planting area (1st rotation):</i>					
RDNZ/FMNZ	47.00	35.00	65%	35%	42.80
Te Koawa Station feasibility study:					
Existing planted area (1 st rotation)	Not harvested				
New planting area – 1 st rotation (Incl. the 2017 planting)	47.00	35.00	65%	35%	42.80

**Production costs
(cartage)**

The cartage unit cost is based on:

- The lead distance from a forest block to a destination (a route).
- The assigned type of cartage schedule for each specific route.

The cartage cost assumptions applied in this feasibility study and the ones assumed by RDNZ and FMNZ are summarised in Table 6.

Table 6: Cartage cost assumptions

	Lead distance to port	Unit cartage cost
	(km)	\$/m ³
RDNZ/FMNZ	53	17.10
PF Olsen	53	17.60-19.60
Te Koawa Station feasibility study	53	18.20

**Production costs
(other)**

RDNZ's assumptions for other production related costs for Te Koawa Station are summarised in Table 7.

These other production related costs are in-line with what PF Olsen expected in the Gisborne region, and PF Olsen has no reason for not adopting these cost assumptions from RDNZ.

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Table 7: Other production cost assumptions

	Pre-harvest inventory (PHI)	Harvest supervision & management fee + Post-harvest costs and contingencies
	(\$)	(\$/m ³)
<i>Existing planted area:</i>		
RDNZ/FMNZ		7.00
PF Olsen		6.50-8.00
<i>New planting area – 1st rotation (Incl. the existing 2017 planting)</i>		
RDNZ/FMNZ	10,000	7.00
PF Olsen	\$60-\$120/ha	6.50-8.00
Te Koawa Station feasibility study:		
Existing planted area		Not harvested
New planting area (incl. the 2017 planting)	10,000	7.00

Forestry costs

Based on our forest inspection in October 2021, PF Olsen believes that FMNZ's forestry cost assumptions are adequate. The forestry cost assumptions applied in this feasibility study (including a 15% forest management supervision, and QC charge) are summarised in Table 8.

For this feasibility study, PF Olsen has assumed that forestry is the highest and best use of the Te Koawa Station. This will be especially relevant in the future due to the carbon liability created if the land owner decides to participate in the NZETS. The land will be replanted with the second rotation tree crop before selling both land and tree crop after the first rotation tree crop is harvested.

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Table 8: Forestry cost assumptions (in \$/ha)

Operation	Age	RDNZ/FMNZ		Feasibility study	
		% of Area	FR550	% of Area	FR550
Land preparation (1R) – new plantings					
- Poplar control	0	20 ha @1500/ha			
Establishment (1R) – northern PRAD (production) = 140 ha					
- Planting (labour)	0	100%	726	100%	726
- Seedling	0	100%	463	100%	463
- Post-plant releasing	0	100%	375	100%	375
- Contingency blanking	1	10%	119	10%	119
- Contingency release	1	10%	38	10%	38
Establishment (1R) – southern PRAD (permanent) = 169.7 ha					
Planting (labour)	0	100%	726	100%	1,137
Seedling	0	100%	463	100%	655
Post-plant releasing	0	100%	375	100%	450
Contingency blanking	1	10%	119	10%	179
Contingency release	1	10%	38	10%	45
Establishment (1R) – southern redwood (permanent) = 50 ha					
Planting (labour)	0			100%	1,281
Seedling	0			100%	1,435
Post-plant releasing	0			100%	450
Contingency blanking	1			10%	272
Contingency release	1			10%	45
Silviculture					
- Waste thin	9	100%	948	100%	948
Establishment (2R) – northern PRAD (production) = 140 ha					
- Land preparation (aerial spray)	0	100%	284	100%	284
- Planting (labour)	0	100%	726	100%	744
- Seedling	0	100%	463	100%	463
- Post-plant release	0	100%	375	100%	375
- Contingency blanking	1	10%	119	10%	119
- Contingency release	1	10%	38	10%	38

General overheads and other fixed costs

The general overheads, other fixed costs, and ETS cost assumptions are summarised in Table 9. In addition, there is a Forest & Operation Management fee based on 5% of the forest tracking cost, animal control, and property maintenance & protection fee in Table 9, as well as all the forestry costs summarised in Table 8.

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The insurance cost (fire & public liability) by age assumed in this feasibility are presented in Appendix 10. Recently, insurance premiums for fire and wind damage of tree crops in New Zealand have increased substantially. As RDNZ manages various forest investments in the Gisborne region as well as other regions in New Zealand to diversify the fire damage risk, RDNZ and its insurance provider advised that the insurance premium for the Te Koawa Station will not be subject to a substantial increase in insurance premium. The insurance premium assumption applied in this feasibility study is in-line with what RDNZ is paying for its current insurance coverage.

Table 9: Property maintenance & management fees, administration, and general overheads

YE March	FMNZ/RDNZ		Feasibility study	
	\$	\$/ha (p.a)	\$	\$/ha (p.a)
Property maintenance & protection		20		20
Fire & public liability insurance (age 0 to 33)		8-98		8-98
Council rates (2022 p.a.) ¹	12,535		12,240	
Council rates (2023+ p.a.) ²	11,000		11,000	
Accounting and audit (2023+ p.a.)	3,000		3,000	
Forest & operation management:				
- Administration expense (p.a)	12,000		12,000	
- Fixed fee (p.a.)	9,000		9,000	
- % of forestry related operational expenditures	5.00%		5.00%	
Tracking (2023)	50,000		50,000	
Animal control (2023)	10,000		10,000	
Animal control (2024-25)	7,500		7,500	
Animal control (2026)	5,000		5,000	
Animal control (2027-50)	2,000		2,000	
Animal control (2027-2050)	500		500	
Animal control (2051-2052)	3,000		3,000	
Remapping & inventory & Consents (2023)	10,000		20,000	
Remapping & inventory (2031)	10,000		10,000	
Remapping & inventory (2048)	10,000		10,000	
NZETS annual return (2023)	15,000		14,198	
NZETS FMA plots (2023)			11,400	
NZETS annual return (2024)	1,432		2,798	
NZETS registration & annual return (2025)	1,432		14,528	
NZETS FMA plots & annual return (2026)	15,000		19,844	
NZETS annual return (2027-2040) (p.a)	15,000		1,604	
NZETS FMA plots (2026, 2031, 2036)			18,240	
NZETS annual return (2041-2052) (p.a)	15,000		1,289	
NZETS FMA plots (2026, 2031, 2036)			16,340	

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¹ Total council rate was \$7,189 (incl. GST) for a title area of 155.15 ha in 2021/22 (YE June). The vendor will retain 23.84 ha of the title area (155.15 ha) after the settlement. $\$7,189 \div 1.15 \times 80\% = \$5,001$ p.a

² Total council rate was \$7,189 (incl. GST) for a title area of 155.15 ha in 2021/22 (YE June). The vendor will retain 23.84 ha of the title area (155.15 ha) after the settlement. $\$7,189 \div 1.15 \times 80\% = \$5,001$ p.a

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The initial investment, initial set-up cost, divestment assumptions applied in this feasibility study are summarised in Table 10. The fund level annual cost assumptions are presented in Table 11.

Table 10: Initial investment, set up cost, and divestment assumptions

Item	Year (YE Mar)	RDNZ	Feasibility study
Initial investment (Capital costs)			
- Total purchase price (100%)	2022	6,950,000	6,950,000
Set Up costs – fund level			
Capital raise fee: 2.00% on total capital raised ³	2022	139,000	139,000
Legal	2022	144,457	144,457
Marketing fees	2022	96,305	96,305
FMA	2022	8,025	8,025
FMA supervisor	2022	4,815	4,815
Set up costs – property level			
Establishment fee - 2.75% on purchase price	2022	191,125	191,125
Legal due diligence & conveyancing	2022	20,000	20,000
	2023	15,000	15,000
Subdivision	2022	10,000	10,000
	2023	35,000	35,000
Feasibility and tree crop valuation	2023	23,000	23,000
Land valuation	2023	5,000	5,000
Contingency	2023	15,000	15,000
Financing	2022	46,333	46,333
Divestments			
Sale of farmhouse and land ⁴	2023	850,000	850,000
Sale of land ⁵	2052	2,439,760	3,843,620
Sale of tree crop ⁶	2052	905,400	313,000

Source: RDNZ

Table 11: Fund level annual cost assumptions

Item	Year (YE Mar)	RDNZ	Feasibility study
Investment management (p.a.):			
- 0.75% of total asset value	2023-52	0.75%	0.75%
Assurance & accounting	2023-51	3,000	3,000
Valuation	2023-51	5,000	5,000
FMA	2023-51	2,408	2,408
FMA supervisor	2023-51	8,025	8,025

Source: RDNZ

³ Total capital raised is assumed to be NZ\$6.95 million.

⁴ RDNZ has assumed that after subdivision the land (approx. 19.4 ha) and improvements will be sold at \$850,000.

⁵ PF Olsen has assumed that the land will be divested at \$4,000/ha for the production forest and \$12,000/ha for the permanent forest (from remaining carbon premium).

⁶ PF Olsen has assumed the tree crop will be divested at \$2,000/ha for the production forest and \$0/ha for the permanent forest.

5. Log price and market assumptions

Pricing perspective

PF Olsen's actual historical export log prices at wharf gate (AWG) at the Eastland Port are presented in Figure 2.



Figure 2: PF Olsen export log prices – Eastland Port (Real 2022\$ AWG)

Log price assumptions

Although the log export market recovered from the first Covid-19 lockdown in March/April 2020, interruption of global logistics has caused a substantial rise in demurrage and freight costs. The demand for logs from China is slowing down due to the rising default risk of some property developers and weaker manufacturing activity.

The log price assumptions applied in RDNZ's financial model are mostly in-line with PF Olsen's log price assumptions, expect pruned log prices (P40, P35).

The log price assumptions assumed in this study are presented Table 12, based on the historical actual log prices at Eastland Port (see Appendix 8 for more detailed information). A sensitivity analysis of the log prices will be examined in Section 8 to evaluate the potential impact of market uncertainty.

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Table 12: Log price assumptions for radiata pine at Eastland Port

	Actual	Projection				
Log grade	Last 12 months	2022	2023	2024	2025	2026+
P40	170	171	173	175	177	179
P35	168	145	147	149	150	152
A	131	133	135	136	138	140
K	118	120	121	123	124	126
KI	104	106	107	109	110	112
KIS	94	96	97	99	100	102
Pulplog (Domestic)	55	Break-even				

6. Land and property values

Introduction

PF Olsen staff are NZIF Registered Forestry Consultants, but we are not Registered Land Valuers. The Te Koawa Station consists of the acquisition of the land, carbon, improvements, and tree crop.

Land value

RDNZ engaged Logan Stone (a registered rural property valuer) in January 2022 to value the subdivided freehold land of the Te Koawa Station. In the Logan Stone report, the title area is assessed to be 602.70 hectares more or less. Of which, 464 ha more or less is estimated to be productive (or plantable for forestry uses).

The market value of the Te Koawa Station estimated by Logan Stone was \$8.63 million as at 17 January 2022 (Table 13). Of which, the unimproved land value was estimated to be approximately \$5.32 million.

Table 13: Land value – Te Koawa Station

Item	NZETS type	Area (ha)	\$/ha	Value (\$ million)
Plantable – greenfield	Averaging	142.67	15,520	2.214
Plantable – greenfield	Permanent	217.00	9,049	1.963
Planted – existing	Permanent	88.00	12,378	1.089
Planted – existing	Pre-1990	16.48	3,200	0.053
Building & other improvements				0.972
Carbon credits accrued and receivable				2.338
Total Te Koawa Station				8.630

Source: Logan Stone (January 2022)

Divestment land value

In this feasibility, PF Olsen has assumed that all the sequestered carbon will be sold and most of the improvement will be depreciated. The divestment land value assumptions are presented in Table 14.

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Table 14: Divestment land value – Te Koawa Station

	Current NZETS status	NZETS type	Plantable area (ha)	Divestment land value (\$/ha)	Feasibility study (\$ million)
Plantable (greenfield)	Post-1989	Averaging	140.0	4,000	0.560
Existing planted	Pre-1990	-	16.5	4,000	0.066
Plantable (greenfield) with carbon premium	Post-1989	Permanent	219.7	712,000	3.677
Existing planted without carbon premium	Post-1989	Permanent	30.2		
Existing planted without carbon premium	Post-1989	Permanent	56.5		
Total market value					4.303

⁷ \$12,000/ha is an area-weighted average from the permanent forest areas based on a 10% discount rate being used to discount future cash flows from 2053 and onwards. The 219.7 ha permanent forest planted in 2022 (YE Dec) may still have some potential carbon revenue from 2053 (YE March). However, the 30.2 ha and 56.5 ha of permanent forests planted before this project starts is likely to have zero carbon after 2053.

7. New Zealand Emission Trading Scheme (NZETS)

Overview

The New Zealand Emissions Trading Scheme (NZETS) was created by an amendment to the Climate Change Response Act 2002. Under the NZETS, carbon is sequestered and traded in the unit of New Zealand Unit (NZU), which represents one metric tonne of carbon dioxide equivalent.

This feasibility study assumes the NZETS eligible area of this property will be registered into the NZETS under the Averaging Accounting Approach (or Averaging Carbon Approach) in the financial year of 2024 (YE March), once stocked area can be reliably mapped from aerial photography.

More details of the NZETS, definitions, obligations, compliance & penalties, and carbon price are described in Appendix 9.

Carbon table assumption

PF Olsen has assumed that RDNZ will manage this property under the NZETS with Field Measurement Approach (FMA). As a relatively conservative approach, this feasibility study has used both MPI Look-Up tables and projected FMA carbon table in this feasibility study to project the potential accumable carbon in this feasibility study (Table 15).

Table 15: NZETS Carbon – Te Koawa Station

Resource type	Species	Planted year	NZETS type	Carbon table	Plantable area (ha)
Existing plantings:					
Planted – existing	Various	Various	Permanent	MPI Table	56.5
Planted – existing	Radiata pine	1990-91	Permanent	MPI Table	30.2
Planted – existing	Radiata pine	2017	Pre-1990	-	16.5
Future plantings:					
Plantable – greenfield	Radiata pine	2022	Averaging	FMA	140.0
Plantable – greenfield	Radiata pine	2022	Permanent	FMA	169.7
Plantable – greenfield	Redwood	2022	Permanent	MPI Table	50.0
Total plantable					462.9

Under the FMA, PF Olsen has assumed that the total carbon (NZU) sequestered at age 16 will be higher than under the MPI Look-Up Table Approach by approximately 49% (Figure 3). This is based on what Forecaster predicted and what PF Olsen have observed in the region (Appendix 9).

The MPI Look-Up Tables for radiata pine and other minor species to derive the carbon from permanent forests in this feasibility study are illustrated in Figure 6 (Appendix 9).

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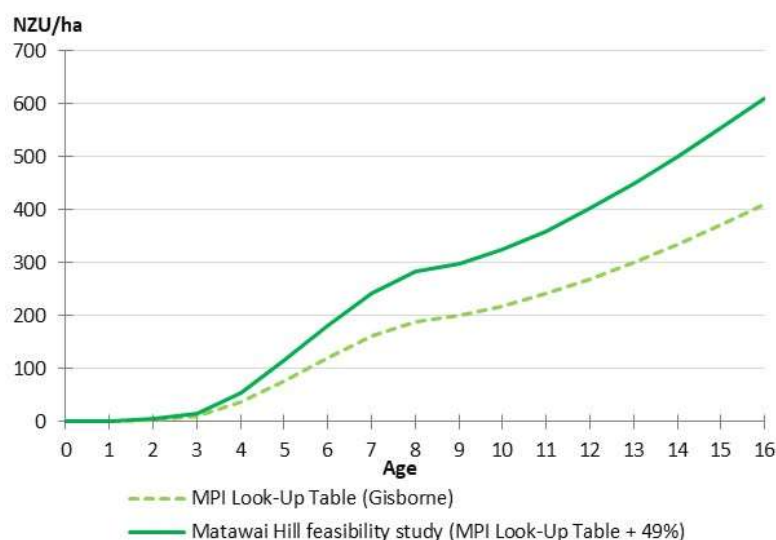


Figure 3: Potential tradable carbon per hectare from the Te Koawa Station – Average Carbon Approach (radiata pine)

The total number of NZUs potentially available for trading in this feasibility study is summarised in Table 16.

Table 16: Projected Tradable Carbon – Te Koawa Station

				Projected tradable NZUs		
Resource type	Species	Planted year	Plantable area (ha)	Balance	Receivable (2018-2022)	Future (2023+)
Existing plantings:						
Planted – existing	Various	Various	56.5	15,125	8,634	33,709
Planted – existing	Radiata pine	1990-91	30.2	9,889	4,042	13,472
Planted – existing	Radiata pine	2017	16.5	-		
Future plantings:						
Plantable – greenfield	Radiata pine	2022	140.0	-		85,260
Plantable – greenfield	Radiata pine	2022	169.7	-		283,331
Plantable – greenfield	Redwood	2022	50.0	-		32,040
Total plantable			462.9			

**NZETS set up and
administration
costs
assumptions**

Costs involved in set-up and participation in the NZETS have been estimated as follows:

- MPI registration fee of \$500 (one-off);
 - Mapping (\$14/ha);
 - Young tree verification (\$25/ha);
 - MPI emissions return filing fees of \$90 per return.
 - Field Measurement Approach (FMA) inventory costs once every five years (NZ\$380 per FMA sample plot).
-

**Carbon (NZU)
price assumption**

The carbon price assumptions applied in this feasibility are:

- NZ\$72.00/NZU flat from 2022 and onwards (before carbon trading commission); and
 - Carbon trading commission of 2.0% per transaction (NZ\$70.56/NZU after trading commission).
-

8. Financial Returns and Sensitivity Analysis

Assumptions

Assumptions for this feasibility study include:

- Land and improvements purchase prices:
 - The Te Koawa Station at 1131 Whakarau Road, Otoko, Gisborne for \$6.95 million;
 - The farmhouse and land (approx. 19.4 ha) will be subdivided and sold at \$0.85 million by 2023 (YE March);
 - Silvicultural regime (production forest): Framing regime, initial stocking at 833 stems per hectare, unpruned, waste thinned to a target of 550 stems per hectare at age 9;
 - Silvicultural regime (permanent forest -radiata pine): initial stocking at 1,100 stems per hectare, unpruned, waste thinned to a target of 700 stems per hectare at age 9.
 - Silvicultural regime (permanent forest -redwood): initial stocking at 1,100 stems per hectare (mix planting with radiata pine, unpruned, waste thinned all radiata pine to a target of 600 stems per hectare at age 9).
 - NZETS carbon trading strategy for NZETS post-1989 eligible area:
 - PF Olsen's projected Field Measurement Approach (FMA) carbon yield table;
 - Average Carbon Approach at age 16 (totalling 610 NZU per eligible planted hectare);
 - A flat carbon price of NZ\$70.56/t CO₂e (after trading commission of 2.0%).
 - Forecasting log price assumptions: PF Olsen long-term average log prices have been applied;
 - No notional land rental has been applied;
 - Terminal Value in 2052 YE March:
 - The 156.5 ha of production forest will be replanted and sold for \$0.31 million (\$2,000/ha) for the tree crop and \$0.63 million (or \$4,000/ha) for the land; and
 - The 306.4 ha of permanent forest (incl. land, with remaining carbon premium) will be sold for \$3.68 million (\$12,000/ha).
-

**Investor - real
internal rate of
return (real IRR,
pre-tax)**

The cash flow of this project is presented in the Investor Product Disclosure Statement. It shows the projected forest development expenditures, forecast revenues, in real terms, for the Te Koawa Station in accordance with the investment structure described earlier.

The original financial model provided by RDNZ on 12 October 2021 derived the project IRR (pre-tax) at 8.4%. By applying the revised assumptions described in this feasibility report, the project IRR is estimated to be 10.9%.

The IRR is based on current NZETS regulations and rules. As the project relies heavily on carbon returns it is susceptible to political risk which is not possible to manage.

**Sensitivity: log
price and
production cost
assumptions**

Table 17 illustrates the sensitivity of the investor IRR (real, pre-tax) to variations in log prices and production costs.

Table 17: Sensitivity - Change in production costs and log prices

Investor IRR (%)	% Change in log price				
% Change in total production cost	-10%	-5%	Base	+5%	+10%
+10%	10.8%	10.8%	10.8%	10.9%	10.9%
+5%	10.8%	10.9%	10.9%	10.9%	10.9%
Base	10.9%	10.9%	10.9%	10.9%	11.0%
-5%	10.9%	10.9%	11.0%	11.0%	11.0%
-10%	10.9%	11.0%	11.0%	11.0%	11.0%

**Sensitivity –
carbon credit
NZU price**

Table 18 illustrates the sensitivity of the investor IRR (real, pre-tax) to variations in carbon credit NZU price.

Table 18: Sensitivity - Change in carbon credit NZU price

Investor IRR (%)	% Change in NZU price				
	-50%	-20%	Base	+20%	+50%
Change in NZU price	4.2%	8.2%	10.9%	13.6%	17.8%

**Sensitivity –
recoverable
volume (yields)**

Table 19 illustrates the sensitivity of the investor IRR (real, pre-tax) to variations in total recoverable volume yields (TRV in m³/ha).

Table 19: Sensitivity - Change in recoverable volume (yields)

Investor IRR (%)	% Change in recoverable volume (yields)				
	-20%	-10%	Base	+10%	+20%
Change in recoverable volume	10.8%	10.9%	10.9%	11.0%	11.0%

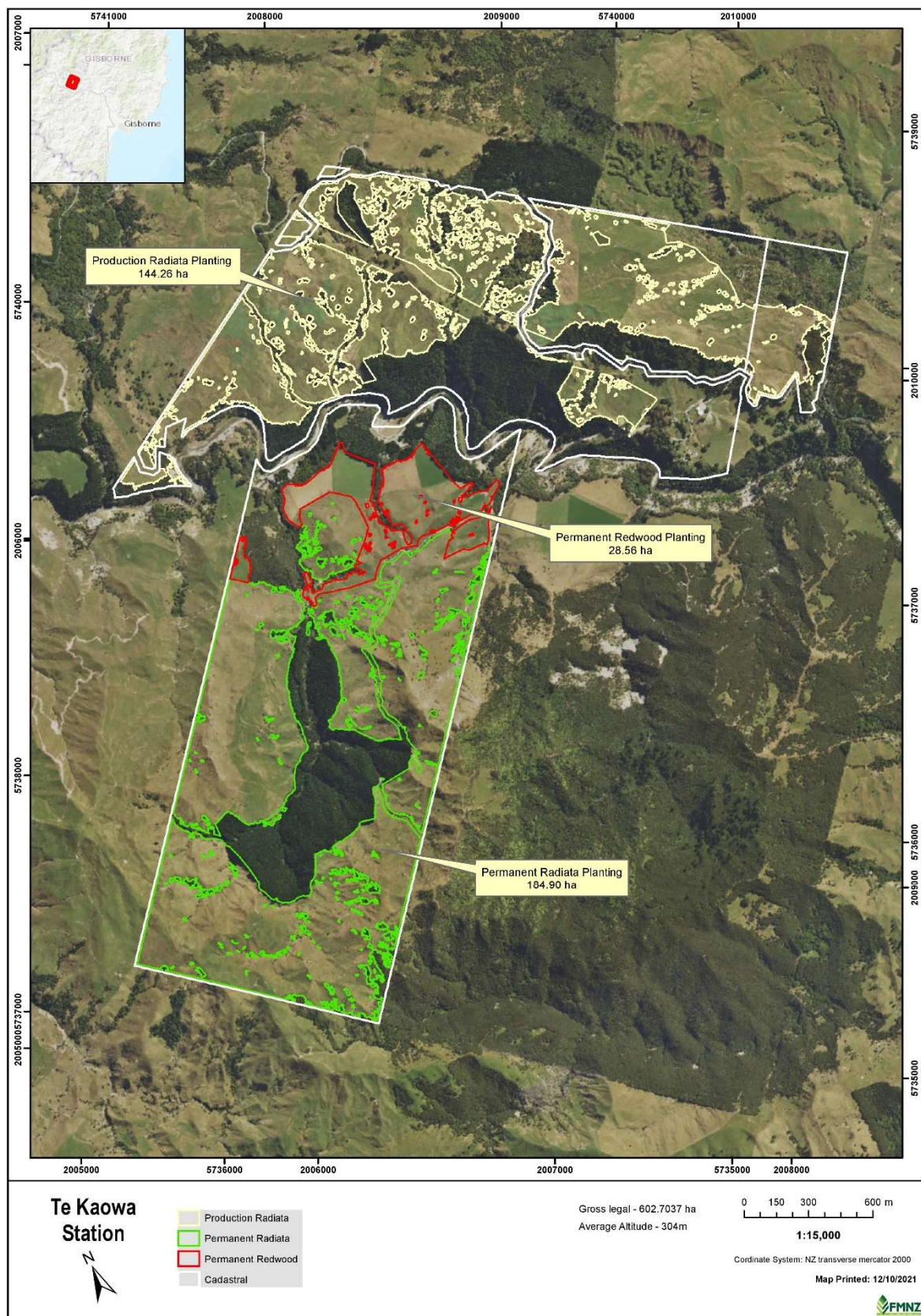
**Sensitivity –
divestment value**

RDNZ has advised that the Te Koawa Station will be replanted and divested at the end of the project (2052 YE March). The tree crop and land are estimated to be sold at a total of \$4.62 million in 2052 YE March. Table 20 illustrates the sensitivity of the investor IRR (real, pre-tax) to variations in divestment value. Because the divestment is anticipated to be in around 30 years from now, the change in divestment value has minimal impact to the project IRR.

Table 20: Sensitivity - Change in divestment value

Investor IRR (%)	% Change in divestment value				
	-20%	-10%	Base	+10%	+20%
Change in divestment value	10.9%	10.9%	10.9%	10.9%	11.0%

Appendix 1: Te Koawa Station – estate map



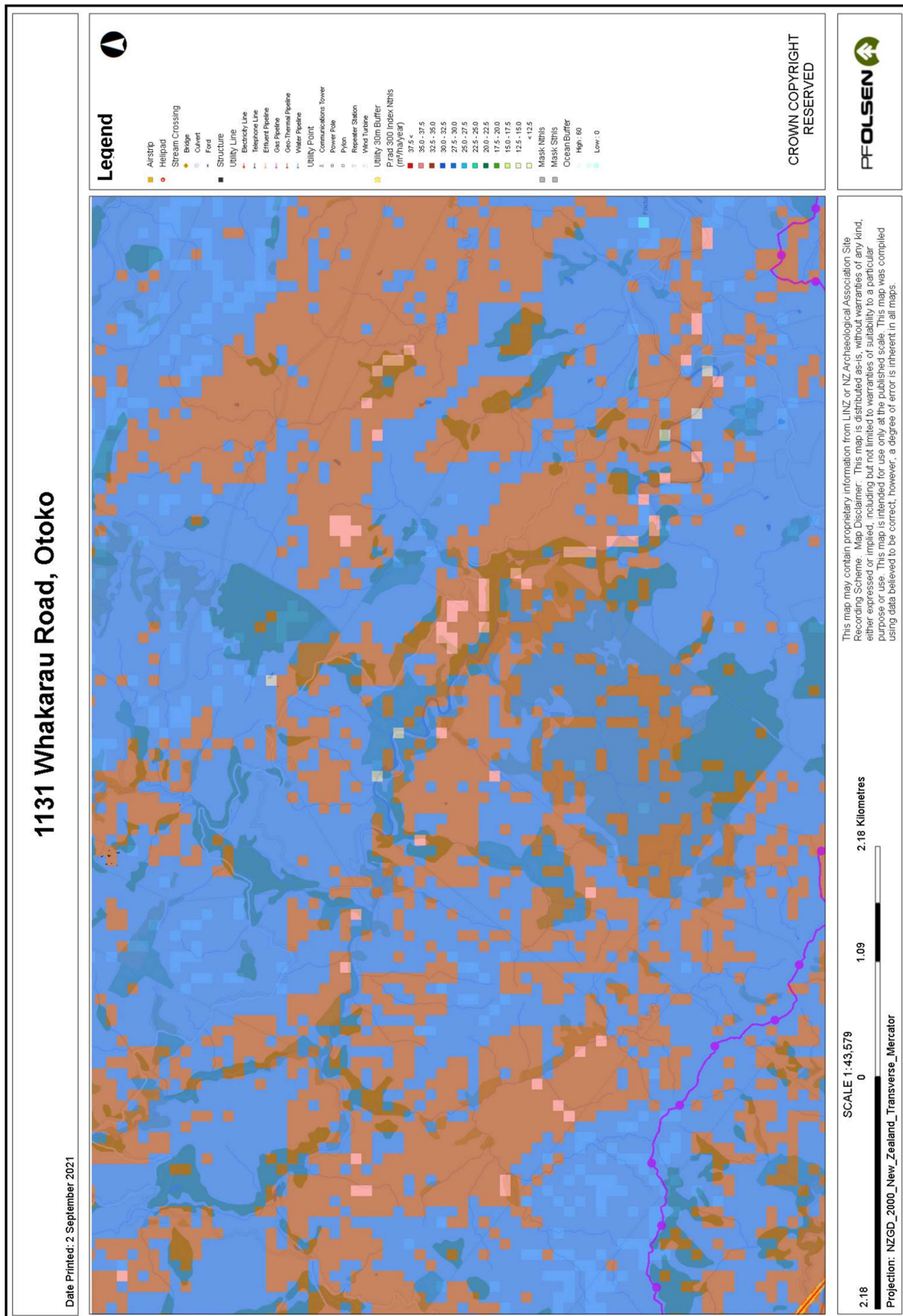
Appendix 2: Detailed forest descriptions

Table 21: Detailed resource descriptions – Te Koawa Station

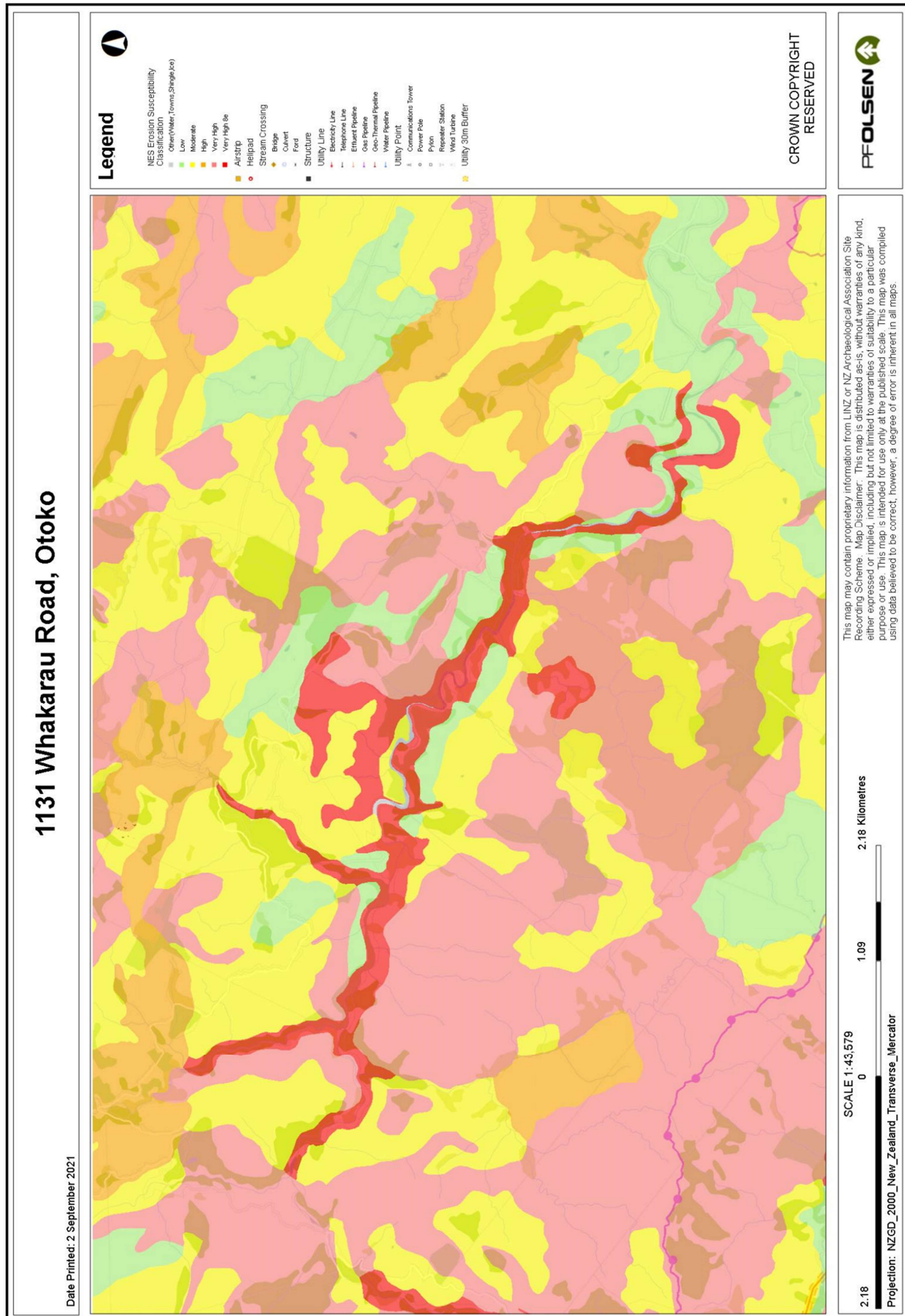
Resource type	CAA No	Species	YE Dec	NZETS type	Timber harvest revenue	Plantable area (ha)
Planted – existing	5	Exotic softwood	1994	Permanent	No	2.8
	6	Exotic softwood	1996	Permanent	No	1.3
	13	Exotic softwood	1990	Permanent	No	3.3
	2	Exotic softwood	1991	Permanent	No	1.1
	4	Douglas-fir	1993	Permanent	No	1.1
	7	Douglas-fir	1997	Permanent	No	2.2
	8	Radiata pine	1991	Permanent	No	8
	9	Radiata pine	2001	Permanent	No	32.9
	16	Radiata pine	1990	Permanent	No	1
	14	Radiata pine	1990	Permanent	No	2.8
Planted – existing		Various	Various	Permanent	No	56.5
	1	Radiata pine	1990	Averaging (to Permanent)	No	12.4
	11	Radiata pine	1990		No	1.6
	3	Radiata pine	1991		No	13.4
	10	Radiata pine	1990		No	1.9
Planted – existing		Radiata pine	1990-91	Averaging (to Permanent)	No	30.2
Planted – existing		Radiata pine	2017	Pre-1990	Yes	16.5
Plantable – greenfield		Radiata pine	2022	Averaging	Yes	140.0
Plantable – greenfield		Radiata pine	2022	Permanent	No	169.7
Plantable – greenfield		Redwood	2022	Permanent	No	50.0
Total Plantable area						462.9

Source: RDNZ and Bayleys

Appendix 3: Te Koawa Station – Radiata Pine 300 Index



Appendix 4: Te Koawa Station – NES-PF



Appendix 5: Field inspection



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Appendix 6: Forecaster settings – future rotation

Yield estimation methods

The Forecaster settings used to derive the yield tables for the future rotation (radiata pine new plantings) are presented in Table 22 and Table 23.

Table 22: Forecaster – growth model settings

Parameter	Forecaster
Growth model	300 Index (PRAD)
Volume & Taper model	182
Breakage model	1
Stump height	0.3m

Table 23: Forecaster – site settings

Parameter	Setting
Latitude	39.4095 South
Longitude	177.6552 East
Altitude	246 metres
Site Index	35.00
300 Index	32.50

Cutting strategy

The cutting strategy applied in Forecaster is summarised in Table 24.

Table 24: Cutting strategy in Forecaster

Grade	Min Small End Diameter (SED) (cm)	Max Branch Size (cm)	Length (m)	Description
P40	42	0	4.4, 5.0	High quality pruned
P35	37	0	4.4, 5.0	Lower quality pruned
A	33	12	4.0, 6.0	Large sawlog
K	24	12	4.0, 6.0	Small sawlog
KI	26	25	4.0	Industrial log
KIS	14	No limit	4.0	Small Industrial log

Consistency of yield estimates with the forest description

Yield tables are generated and expressed in m³/ha. The base volume unit for the valuation is m³, so there is no conversion factor required for the yield estimation process.

**Yield
adjustments**

PF Olsen applied these adjustments to the raw Forecaster outputs:

- A -10% adjustment across all log grades.
-

Appendix 7: Yield table analysis

Yield tables

Future rotation (new planting in 2022) and Existing radiata pine planting (planted in 2017): a single generic yield table was derived from Forecaster has been applied for this feasibility study (Appendix 6).

Total recoverable volume (TRV)

Figure 4 compares the adjusted total recoverable volume per hectare with the Gisborne regional average published from MPI⁸. It can be seen that the adjusted TRV from Forecaster is much higher than the regional average due to the site productivity is relatively higher than the national and regional averages.

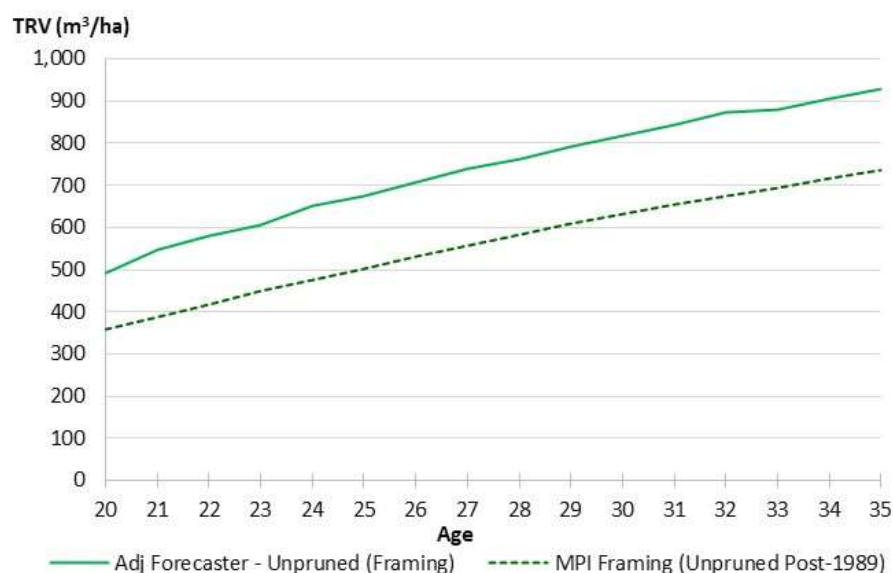


Figure 4: Yield table by total recoverable volume

⁸ MPI – Ministry for Primary Industries

Grade out-turn

Figure 5 compares the adjusted grade out-turn with PF Olsen’s regional average at clearfell age 30 years old. It can be seen that the adjusted Forecaster yield table is in-line with PF Olsen’s regional average.

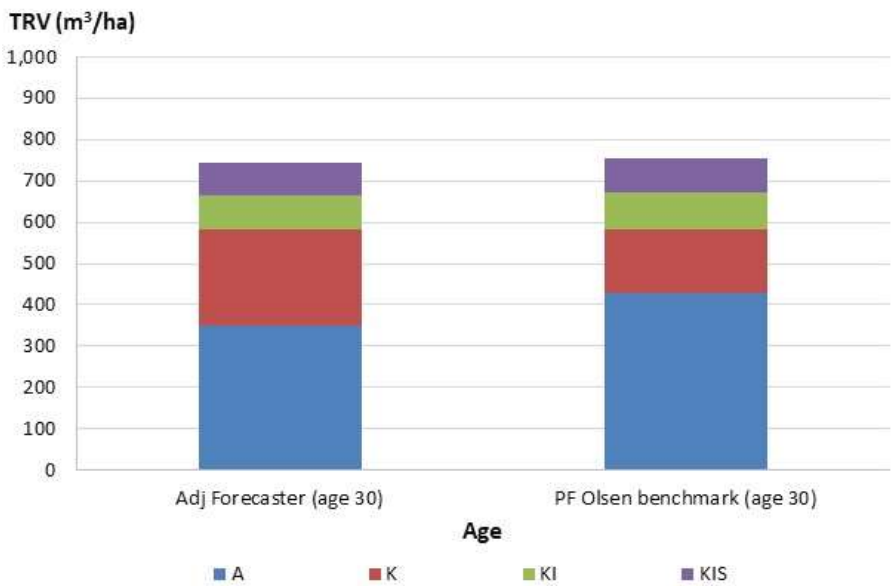


Figure 5: Adjusted Forecaster yield table by grade at age 30

Appendix 8: Log prices

Conversion factors

Conversion factors (JASm³/m³) have been updated based on actual 2019-2020 regional averages for the respective log grades.

Table 25: Conversion factors applied in the Gisborne region

Log grade	JASm ³ /m ³
P40	0.990
P35	0.990
A	1.050
K	0.965
KI	0.970
KIS	0.920

Log price assumptions

Export log prices are derived from an inflation-adjusted average of monthly prices offered to PF Olsen at the Eastland Port (at wharf gate).

We assume the log prices will gradually revert from near-term averages (last 12 months) to long-term averages by 2026 (YE Mar):

- The near-term averages are based on the actual prices that PF Olsen achieved in the last 12 months.
- The long-term averages (from 2026+ YE Mar) are based on the actual prices that PF Olsen achieved in the last 5 years (inflation-adjusted).

In the opinion of PF Olsen, based on market evidence analysed, the log prices assumed in this valuation represent a fair and reasonable view of long-term prices by log grade. These prices are considered suitable for use in estimating the market value of the tree crop situated on the Te Koawa Station.

Appendix 9: New Zealand Emissions Trading Scheme (NZETS)

Overview

The NZETS was created by an amendment to the Climate Change Response Act 2002. The NZETS allows for a price to be set on emissions of greenhouse gases, providing appropriate incentives for sectors to reduce their net emissions.

The NZETS treats forest land in two distinct ways, depending on its status on 31 December 1989:

- **Pre-1990 forest land** – land that was established in forest species on or before 31 December 1989, remained forest land on 31 December 2007, and contained mostly exotic forest species on 31 December 2007; and
- **Post-1989 forest land** – land established with exotic or indigenous forest species after 31 December 1989, on land that was not forest land on 31 December 1989 (or on land that was forest on 31 December 1989 but was deforested before 1 January 2008).

Benefits of joining the NZETS are:

- Eligibility to acquire New Zealand Unit (NZU) credits for carbon sequestration;
- Opportunity to earn early income from the sale of credits; and
- Opportunity to accumulate credits for offsetting against emission liabilities.

This feasibility assumes the proposed shift to “Averaging” carbon accounting, as forest land registered into the ETS after 1 January 2019 will be able to utilise the Averaging accounting approach.

Definition of forest land

Forest Land is defined as a minimum area of one hectare of land planted with trees capable of reaching five metres in height and a canopy cover of 30% at maturity (in situ).

Determination of post-1989 forest land status will depend on evidence supplied by the participant. Acceptable evidence to assist in determining post-1989 forest eligibility could include aerial photographs from around 1990, land management records or an acceptable demonstration of forest establishment dates. It is the participant’s responsibility to provide such evidence, if requested by MPI.

Obligations

Forest owners wishing to become post-1989 ETS participants have the following obligations under the ETS:

- **Open a holding account in the New Zealand Emission Unit Register (NZEUR)** – Participants in the ETS must have a holding account for NZUs;
- **Register as a participant with the ETS** - The participant must be able to supply evidence that the land qualifies as post-1989 forest land at this time;
- **Determine Carbon Accounting Areas** – Participants will be required to divide their forest land into discrete Carbon Accounting Areas (CAAs). MPI will hold a ledger of CAAs for each participant, to keep track of credits earned and surrendered on a particular CAA. This is required to ensure that a participant's liability on harvest does not exceed the number of credits earned on any particular piece of land;
- **Calculate changes in carbon stock** – Participants with 100 hectares or more registered in the ETS are required to measure their carbon stocks in a Field Measurement Approach (FMA) inventory at least once in every mandatory emissions return period. Based on these measurement plots a participant specific look up table will be generated. Participants with less than 100 hectares registered in the ETS do not need to install and measure inventory plots, instead using generic regional look-up tables;
- **File an emissions return** – Carbon stock change reports must be submitted at intervals of no less than one year, but at least once during each five-year commitment period. Returns must be submitted during the period 1 January to 30 June following the year to which the return relates;
- **Surrender NZUs** – Participants will be liable for surrenders associated with land deemed to be no longer eligible to remain in the ETS, or if the calculated average carbon stock of a forest area reduces (eg. through a shorter than normal rotation length, or a change in species). Participants with a liability to surrender NZUs must do so within 20 days of filing the return to which the liability relates;
- **Keep records** – Participants must keep records for 20 years of measurements, calculations, transactions and other information for audit purposes; and
- **Notify MPI if land is sold** – The participant is required to notify MPI as soon as practicable (within 20 working days) if the forest land is sold.

Termination Individual participants can exit the ETS either when they sell the forest land to another party, or if they deforest the land and change its use, or if they voluntarily exit the scheme.

The participant is obliged to surrender credits equal to the net balance of credits on any CAA leaving the scheme.

Tax Revenues from sales of carbon credit units (NZUs) are taxable and expenditures for units purchased are a deductible expense, provided the units were purchased to replace credits previously earned and sold. All transactions in NZUs will be zero-rated for GST purposes. This means that no GST will be charged.

All costs and revenues in this analysis have been assessed before consideration of income tax or GST.

Compliance and penalties The ETS is intended to be largely self-policed, much as the tax system currently is in New Zealand. Registration applications and emissions returns will be reviewed, and spot checks and detailed audits will be carried out as MPI deems necessary.

Non-compliance under the ETS can attract both civil and criminal penalties.

NZETS Assumptions Owners of post-1989 forests can voluntarily participate in the NZETS. They can join at any time. In this feasibility study, PF Olsen assumes that the Te Koawa Station new plantings will enter the NZETS in the financial year of 2024/25 (2025 YE March), once stocked area can be reliably mapped from aerial photography, and credits can be claimed from the date of planting.

RDNZ will immediately work on claiming the NZUs that have been already sequestered during the commitment period (between 2018 and 2022 YE Dec).

Carbon flow

The MPI Look-up tables are typically more conservative than those measured using the Field Measurement Approach (FMA). From PF Olsen's NZETS experience with other forest owners in the Gisborne region, the FMA usually achieves better yields (NZU) than the default MPI Look-up tables.

Under the FMA, PF Olsen has assumed that the total carbon (NZU) sequestered at age 16 will be higher than under the MPI Look-Up Table Approach by approximately 49% (Figure 6). This is based on what Forecaster predicted and what PF Olsen experienced in the region

Figure 6 shows the potential difference in tradable carbon yield between the MPI Look-up table Approach and the FMA in the Gisborne region on a per hectare basis. It also shows the MPI Look-Up tables for other minor species for the permanent forest in this feasibility study.

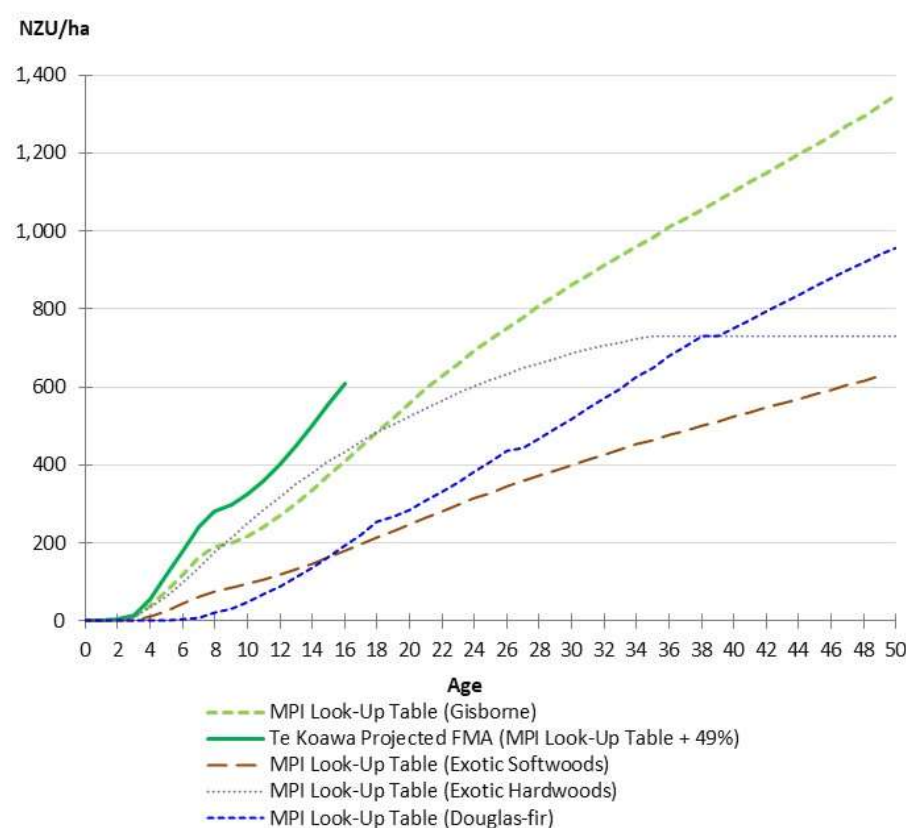


Figure 6: Potential tradable carbon per hectare

In this feasibility analysis, PF Olsen has derived a carbon yield table from Forecaster and compared to other actual FMA data achieved by other forests in the region. PF Olsen has also assumed that the Te Koawa Station will be able to trade its accumulated carbon up to age 16 years old, which is equivalent to 610 NZUs per registered hectare from the production forests.

Carbon price (NZU)

NZUs have traded in New Zealand since early 2010. Figure 7 shows NZU price trends since 2013. Prices are shown in real \$2022.

The NZU liability was initially capped at NZ\$25/NZU before June 2020 through a Fixed Price Option scheme (FPO). The 2020 NZETS Reform has revised the FPO cap upwards to NZ\$35/NZU for the NZETS return year in 2020/21 (year ending March). From the carbon return year in 2021/22, the NZ\$35/NZU cap has been revised upwards to NZ\$50/NZU and replaced with an auction pricing mechanism.

The carbon trading commission for carbon brokers typically varies between 0.5% to 2% per transaction.



Figure 7: NZU prices (2022 real NZ\$ per NZ Unit)⁹

⁹ Source: Commtrade

Appendix 10: Insurance cost by tree crop age

Age	Cost (\$/ha)
0	7.60
1	10.35
2	13.10
3	15.85
4	18.60
5	21.35
6	24.10
7	26.85
8	29.60
9	32.35
10	35.10
11	37.85
12	40.60
13	43.35
14	46.10
15	48.85
16	51.60
17	54.35
18	57.10
19	59.85
20	62.60
21	65.35
22	68.10
23	70.85
24	73.60
25	76.35
26	79.10
27	81.85
28	84.60
29	87.35
30	90.10
31	92.85
32	95.60
33	98.35