northland FOREST MANAGERS

Harvest Viability Investigation

FNDC– Cumber Road

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Summary

The Far North District Council asked Northland Forest Managers to investigate the viability of removing the pines trees around the oxidation ponds in Cumber road, and some hazardous gum and pine trees over the access road.

The conservative nett revenue to council is estimated to be $44,000 based on 4.8 ha of trees on Council land (there is a further 0.5 ha on LINZ managed Crown Land that has been excluded from this analysis)

- This figure has been calculated based on a pre harvest inventory that indicates there is at least 2,200 tonnes of merchantable logs
- A sales value of $280,000 (based on the 2-year average return of $135 per JASm³ for A grade, with current spot @ $145 per JASm³)
- Costs of harvest, transport, roading, planning, crew establishment, old tree removal, fencing, regrassing etc of $236,000.

A number of factors have been included in the costs of removal, with allowances for;

  - 2 stage logging due to concerns about the integrity and safety of the concrete road leading to the ponds if full logging truck and trailers were used
  - Road maintenance should perimeter road deteriorate in inclement weather or not be as sturdy as anticipated
  - Supervision by the lines company of felling of the trees near the transmission lines
  - Archaeological approval due to burial site (NZAA website information maybe incorrect)
  - Allowance for removal of the old gum and pine trees along the road, some within two tree lengths of the house and power wires.

Initial conversation with the neighbour (Zielinski) has conceptual approval for use and alterations to property as outlined below

Removal of the trees needs to take place in dry conditions, with removal taking about 1 month

This report provides a summary of the considerations and potential return from this work

The Earthworks and Harvest Management Plan has been developed using the following industry guidelines and standards:

- **Approved Code of Practice for Safety and Health in Forest Operations.**
- **New Zealand Environmental Code of Practice for Plantation Forestry.**
- **New Zealand Forest Road Engineering Manual.**
- **Northland Forestry Earthworks and Harvesting Guidelines for Northland (Vol 2).**

Consideration should be given to replanting the land, with a budget figure of $2050/ha for pines trees appropriate.

Introduction

NFM was engaged to determine the viability of harvest of the trees around the oxidation ponds in Cumber Road, and remove hazardous trees on the private entrance road to these ponds.

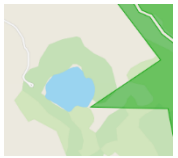
The following information represents the harvest plan for Cumber Road, and the aspects considered when scoping the work. It provides a general description of the way the work is intended to be carried out.

There is always the chance that when the work is being undertaken, it may happen in a slightly different manner to how it is described in this document. Weather conditions or operational conditions and issues on site at the time may result in a variation to the planned works.

Northland Regional Council will be provided with a harvest plan in a different format, as part of the notification process that is required under the National Environmental Standards – Plantation Forestry (NES-PF).

This plan covers specific areas that relate to the NES-PF and the regulations that are specific to;

- Earthworks for roads, and landings.
- Identification of harvest systems, setting identification and critical areas.
- Harvest timing and sequencing.
- Archaeological sites

Aspect	Information	Considerations
Stocked Area	4.8 ha has been used due 0.5 ha of these trees being on Crown owned title. The total stand area was mapped using aerial imagery as 5.3 Ha, compared to 5.4 Ha recorded in Ian Jenkins Valuation report from 2016.	Council will need to determine ownership of these trees
Year of Establishment	Reported as 1984	
Cadastral and Map Reference:	LINZ Parcel ID's 4859154, 4996119, 4996248 Lot 2 Deposited Plan 45233, Section 27 Block IV Punikitere Survey District, Section 2 Block III Punakitere Survey District -35.42613037,173.82286511 LINZ Parcel ID 4840258 appears to be crown property	As above, tree ownership on LINZ managed crown land will need to be confirmed 

Archaeological Sites	One burial site within the titles above (P05/430), and some on neighbouring titles 	- An archaeologist ($4,500) has been allowed for to provide an opinion on impact/risk ○ This may/may not result in a reduction of harvestable area - The burial site described (by NZAA coordinates) as being on the property appears to match the description of the clearly visible area on the neighbouring property. This will need to be clarified.
Erosion Susceptibility rating	25% High , 5% Moderate,69% Low,	The high risk area is subject to restrictions for roading on slopes >25°. There is only a small amount of >25°, and roading through this area is not planned.
Fish Spawning	Group B sensitivity on western stream , Northland Mud Fish (Neochanna heleios) 1st April to 30 September	This will limit work in and around the stream during these periods.
Territorial Authority:	Far North District Council (FNDC)	
Regional Council	Northland Regional Council (NRC)	
Power Lines	Eastern Boundary – high tension powerlines within 2 tree lengths	An observer from the power company for 4 to 5 days $5000 allowance
Fences	Removal of the pine trees may result in some damage to the boundary fences (estimated 600 m) Removal of the old trees on the entrance way will result in damage to the fence estimated 300 m)	An allowance has been made of $7,000 for fencing requirements

Bridge	Bridge P48 does not appear on the FNDC restricted weight bridge list, however its rating will need to be confirmed The bridge on the entrance way is currently too tight to easily get a truck and trailer around.	In a brief discussion with the neighbour, it was suggested that they would be willing to remove some of the bank to allow for easier access. ($1,500 allowed for)
Concrete Road	The slope (20°), width (3m on straights and 4m on corners), and concrete strength (single axle 13 tonne trucks) impacts the ability to remove full truck and trailer loads of logs from the site	Potential 2 stage logging to a staging location has been allowed for ($11,000)
General Roading	It is understood that the track around the pond may be mainly capping metal.	This makes the job a dry weather job, rather than upgrading road at substantial expense. We have allowed for $25,000 in road maintenance as a contingency.
Pipelines	We are unaware of any pipelines (Cory possibly providing a shapefile of pipeline location	
H&S Considerations	Oxidation pond risks, Old trees on entrance ways, water hazards, slopes, rocks, other traffic access along road Power wires to house, and transmission lines House within two tree lengths	- Workers may require vaccinations for Hep A, B and Tetanus - Effluent trucks will need a radio system to facilitate continued operation - Turn off power to house? -
Environmental Considerations	NES-PF requirements (see also fish spawning)	- Work around the stream to prevent mobilisation of soil will be carefully managed
Forest Neighbours & Stakeholders	The property is bounded by several private landowners, and a Crown property	- The most impacted neighbours will be the Zielinskis. We met them have approval in broad terms with work with them to provide a suitable outcome for all parties - As above 0.5 ha appear to be on the Crown Property.

Pre Harvest Inventory

The mapped stand area is rather complex, with parts of the stands walked to determine boundaries between native and pine species.

3 plots covering 2.5% of the area were measured for tree height, form and diameter. The results from 37 trees are;

Parameter	Value
Basal Area	64 m^2/ha
Mean Top Height	37.2 m
Mean Diameter at breast height	51 cm
Average Stem Size	1.9 m^3

There is a high level of variability within the stands on stocked area, and old trees can be more brittle, so the Total Recoverable Volume (TRV) has been discounted to 75% (instead of the usual 85%)

The following grade mix has been used to estimate return. Prior to harvest an optimised sales plan will be completed to capture value from both local and export opportunities

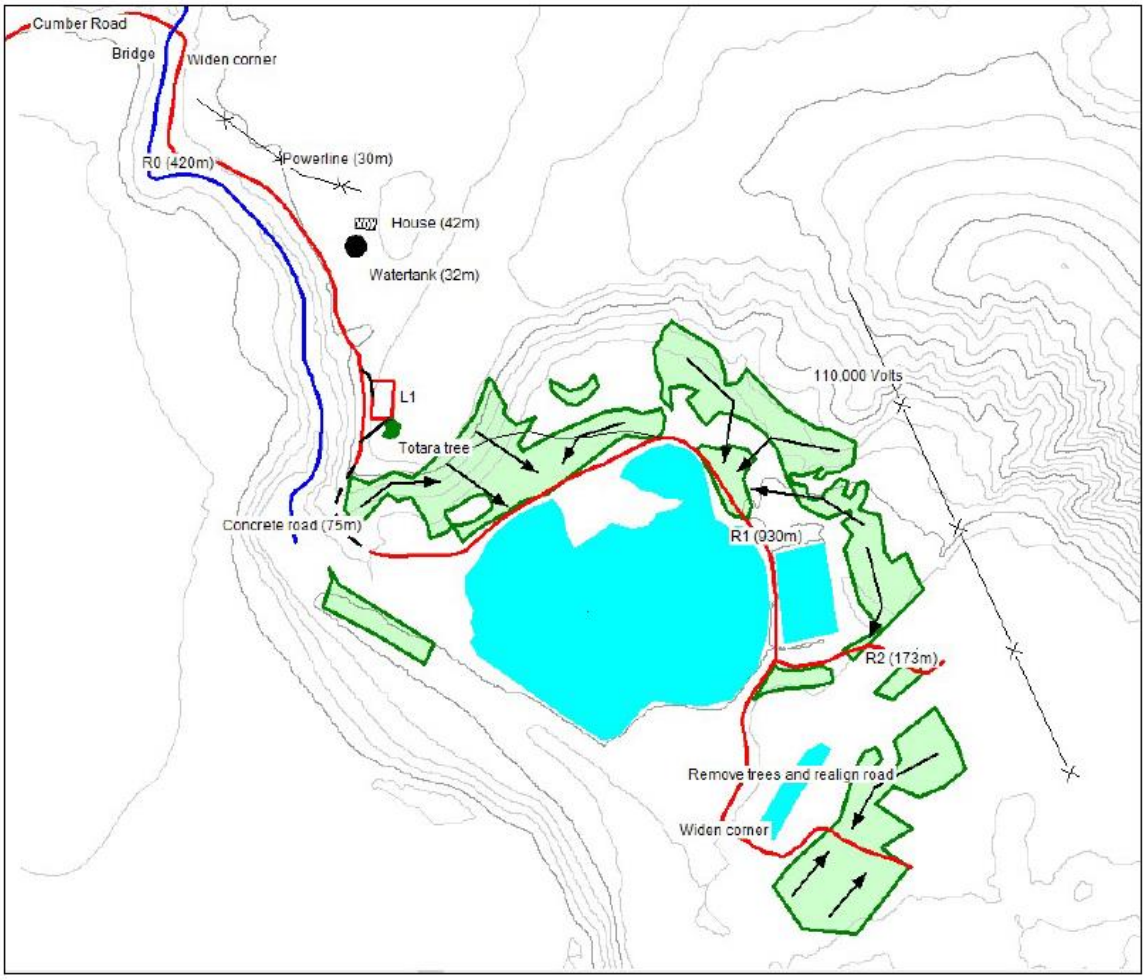
Parameter	Value	Tonnes	Description
P40	14%	309	Premium grade pruned log
P30	6%	132	Pruned log
AO	10%	221	Premium grade unpruned log
A	28%	618	Unpruned log
K	16%	353	Small unpruned log
KI	18%	397	Industrial grade log
KIS	5%	110	Pulp Log (export)
Pulp	3%	66	Pulp Log (local)
Total	100%	2,207	

The grade mix has been discounted from the actual measured to provide some conservatism in the calculations

Financials

Indication of Revenues, Costs and Expenses, Client and Contractor share		
Client:	**FNDC Cumber Road**	
Contract Type	**Managed Sale**	
Date:	**9/03/2021**	
Area:	4.8	**Ha**
TRV:	460	
Year of Establishment	1988	**est**
	excl GST	
	Total	
Weight tonnes	2,207	Per Tonne
Gross Revenue	***$281,085***	***$127***
Expenses		
Logging and Loading	***$97,518***	***$44.19***
Cartage	***$65,613***	***$29.73***
Roading, Landings, Equipment Delivery, Post harvest clean-up	***$60,450***	***$27.39***
Weighbridge	***$662***	***$0.30***
Planning, Engineering, Compliance, Marketing , Supervision, Monitoring, Finance	***$11,985***	***$5.43***
Total Expenses	***$236,229***	***$107.05***
INDICATION of possible return	**$44,857**	**$20.33**

Harvest Planning



Ground Base Logging:

These types of machines are planned for the logging operation;

- Felling Machine,
- Grapple equipped excavator-based machine (shovel machine) used in conjunction with;
- Log Processor

Variation to the Harvest Plan

The plan for accessing and extracting the trees may vary. Any changes to the harvest methodology relating to earthworks / harvesting required will be planned and discussed with the landowner and Northland Regional Council representatives.

Engineering

Engineering program to access the woodlot

- Maintaining current road around pond
- Construction of a landing

General Specifications for Roads and Landings are:

- Roads - 6.0m formation width (water table to water table), 4.0m carriageway/pavement (wider on corners) 0.3m compacted metal depth (extra depth will be required in softer/wet areas)
- Road Grades: Adverse (uphill) <15%, Favourable (downhill) <19%
- Landing - 2,000 - 3000m^2 (60m x 50m) – as terrain allows

Road Aggregate

- The road construction will require volumes of suitable aggregate to build a suitable road for logging trucks to use.
- Suitable rock/aggregate will be sourced from the farm, with capping aggregate brought in.

Arterial Roads, Stub Roads & Stream Crossings

- The forest area is accessed via the unsealed road

Erosion & Sediment Control Plan

Our normal process is;

- 'Opening' the work site will require careful planning to ensure exposed earth is keep to a minimum.
- Ensuring storm water controls are in place and metal is applied to the formed road surface as soon as practical is critical to enable work to continue after a rainfall event.
- If rain is expected before the works are totally completed, then ensuring that basic storm water controls are in place to control water and sediment runoff will be required.
- The location, size & frequency of erosion and sediment control structures (temporary or permanent) will require careful planning. Monitoring & maintaining these will be required to ensure these are operating adequately.
- Stabilisation of the work site may be required to cover the exposed earth around the landing area as it is close to the swamp.

- Regular monitoring of the weather forecast will be required to determine weekly earthworks plan and the likelihood of rainfall events - Recommended weather sites: www.metvuw.com. or www.metservice.com

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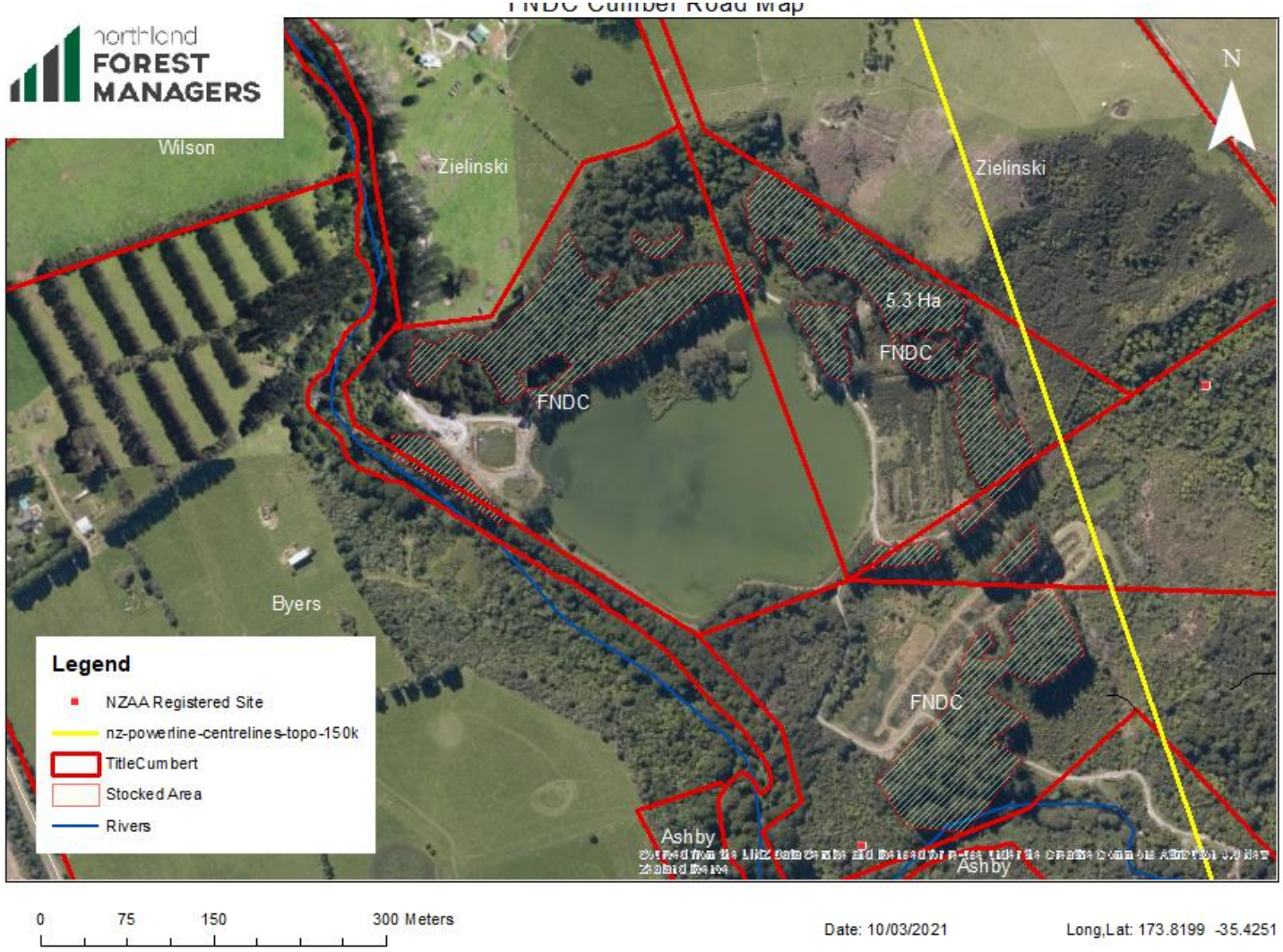
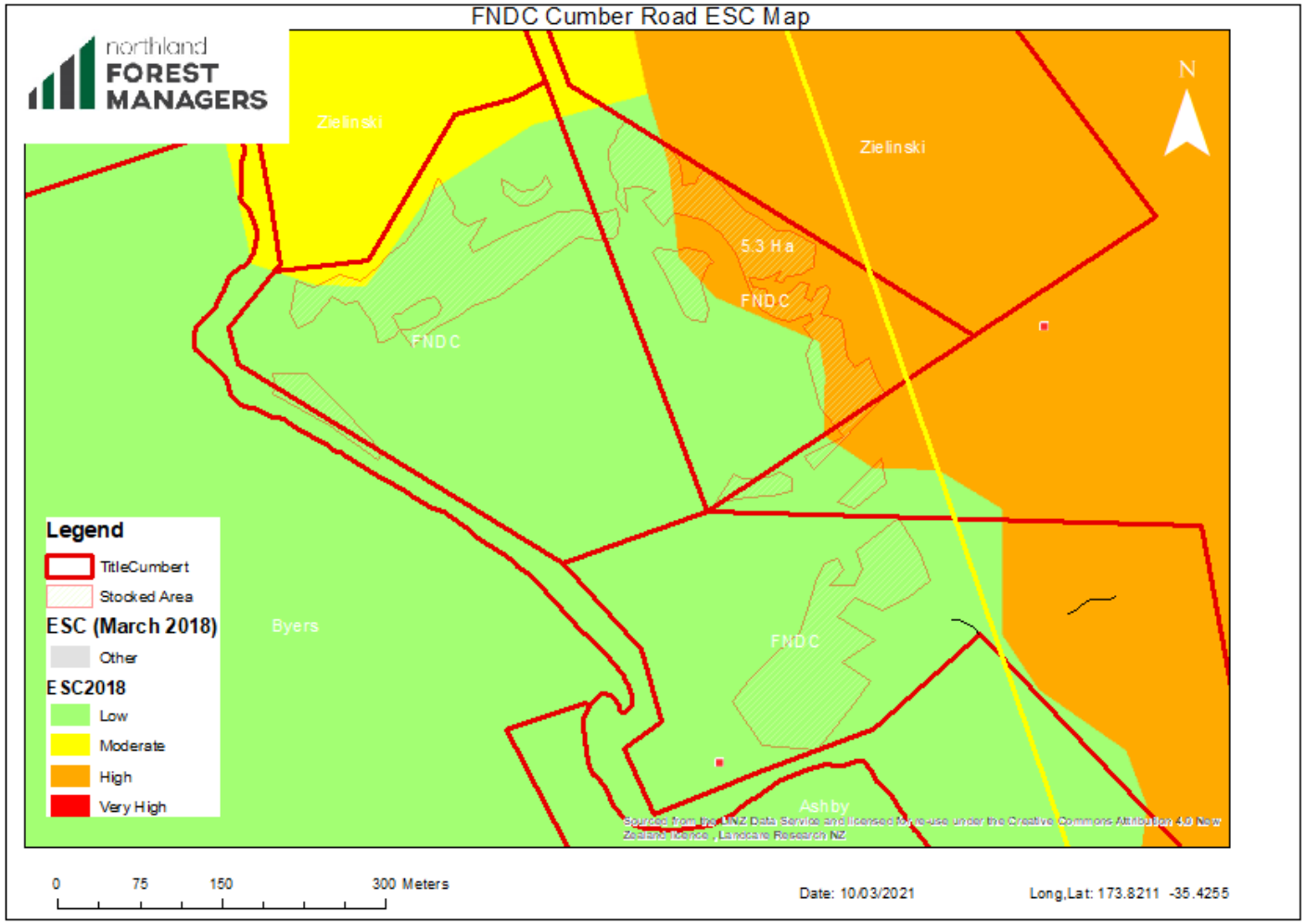
Appendices

Stand Map



NES-PF Erosion Susceptibility & Fish Spawning



NES-PF Fish Spawning Habitats Report: NZFFD Fish Spawning Habitats

10/03/21

FNDC_Cumber

Common Name	Species Name	Sensitivity	Database Source	NZREACH	Spawn From Date	Spawn To Date	Notes
Northland Mudfish	Neochanna heleios	Group B	NZFFD fish habitats		01 Apr	30 Sep	

Harvest return

Indication of Revenues, Costs and Expenses, Client and Contractor share

Client:	FNDC Cumber Road						$3.56	Tonne (includes						
Contract Type	Managed Sale													
Date:	9/03/2021						3.50%	Net Revenue						
Area:	4.8	Ha												
TRV:	460	75% of YTGEN prediction												75%
Year of Establishment	1988	est					Latest							
Tree Age	36		Date:	10/03/2021										
Customer	Export	Export		Export	Export	Local	Export	Export	Export	Marasumi	Total			
Log Grade	P40	P30		AO	A	Post	K	KI	KIS	Pulp				
Destination	MAP	MAP		MAP	MAP	CRO	MAP	MAP	MAP	Portland				
Log Pricing														
Price	$172.00	$137.00		$131.00	$135.00		$127.00	$119.00	$110.00	$46.00				
Currency	NZD	NZD	NZD	NZD	NZD	NZD	NZD	NZD	NZD	NZD				
Units (m3/tJas)	jas	jas	t	jas	jas	t	jas	jas	jas	t				
Price Point	AWG	AWG	AWG	AWG	AWG	AWG	AWG	AWG	AWG	AWG				
Volume														
TRV (m3/ha)	64.365	27.585	0	46.0	128.7	0.0	73.6	82.8	23.0	13.7925	460			
Volume (m3)	309	132	0	221	618	0	353	397	110	66	2,207			
Ytgen %	20%	8%		11%	28%		12%	15%	6%	1%	100%			
Volume (%) adjusted	14%	6%		10%	28%		16%	18%	5%	3%	100%			
Conversion (m3/tonne)	1.00	1.00	1	1.00	1	1	1	1	1	1				
Weight tonnes	309	132	0	221	618	0	353	397	110	66	2,207		1.81	
Weight (%)	14%	6%	0%	10%	28%	0%	16%	18%	5%	3%	100%			
Conversion (Jas/tonne)	1.05	1.01		1.05	0.97	1	0.95	0.86	0.78	1				
NZD/tonne AMG/AWG														
Price AWG/AMG NZD/t	$180.60	$138.37	$0.00	$137.55	$130.95	$0.00	$120.65	$102.34	$85.80	$46.00				
Prodn Costs (NZD/t):														
Total Prod Costs	$108.33	$108.33		$108.33	$108.33	$87.30	$108.33	$108.33	$108.33	$78.41				
Nett Price per grade	$72.60	$30.37	$0.00	$29.55	$22.95	$0.00	$12.65	-$5.66	-$22.20	-$31.08	$ 20.33	per tonne	Per Ha	
Gross Revenue	*$55,797*	*$18,321*	*$0*	*$30,355*	*$80,915*	*$0*	*$42,600*	*$40,652*	*$9,467*	*$2,979*	*$281,085*	*$127.37*	*$58,559*	
Logging & Loading cost	13,903	5,958	0	9,931	27,806	0	15,889	17,875	4,965	1,192	97,518	$44.19	$20,316	
Cartage cost	9,231	3,956	0	6,594	18,463	0	10,550	11,869	3,297	1,652	65,613	$29.73	$13,669	
Roading and other costs	8,463	3,627	0	6,045	16,926	0	9,672	10,881	3,023	1,814	60,450	$27.39	$12,594	
Weighbridge Charges	93	40	0	66	185	0	106	119	33	20	662	$0.30	$138	
Management+Planning (Incl Levy)	2,243	766	0	1,270	3,412	0	1,823	1,796	435	240	11,985	$5.43	$2,497	
Total Expenses	*$33,933*	*$14,347*	*$0*	*$23,905*	*$66,792*	*$0*	*$38,040*	*$42,540*	*$11,753*	*$4,918*	*$236,229*	*$107.06*	*$48,214*	
Profit	$22,429	$4,021	$0	$6,520	$14,179	$0	$4,465	-$2,250	-$2,450	-$2,058	$44,857	$20.33	$9,345	
Nett to Owner	$22,429	$4,021	$0	$6,520	$14,179	$0	$4,465	-$2,250	-$2,450	-$2,058	$44,857		$9,345	
Growers Levy	$101.95	$43.69	$0.00	$72.82	$203.91	$0.00	$116.52	$131.08	$36.41	$21.85	$728.24	$0.33		
											plus GST			
Roading + Landing	$ 4,950	estimate only			m	$/m (or $ each	$							
Roading maintenace	$ 25,000	estimate only		Landings	1	$3,000	$3,000	0						
Power Company	$ 5,000									Things to consider				
Road Control		estimate only								- Hpe C shots				
Fencing	$ 7,000	estimate only		Bridge Access	1	$1,500	$1,500			- Close approach Transpower				
Post-harvest cleanup	$ 4,000	estimate only								- $50/hr x 4 hrs to pull fnece out				
		estimate only								- Includes removal of driveway trees				
Establishment of crew	$ 10,000	estimate only		Contingency (10%)			$450			- regrass/tidy up paddock				
Establishment/Operation/Disestablishment costs total	$ 55,950	estimate only					$4,950			- power to house				
Agent Fee	$ -	estimate only												
Safety auditing (failers/SBOs)		estimate only												
Archaeological assessment/monitoring	$ 4,500	estimate only		Fencing	700	10	$7,000							
Environmental monitoring		estimate only												
Proposed Biosecurity Levy	$ -	estimate only												
Total other costs	$ 60,450	$ 27.39												
Lead	km	Destination	rate/tonne	max										
Distance to port	115	MAP	29.8800											
Distance to CHH Whangarei		WHG	8.8425											
Distance to Rosvall		0	8.8425											
Distance to Marusumi	91	Portland	24.9600											
Distance to Waipapa Pine		Kerl	8.8425											
Distance to CROFT		CRO	8.8425											