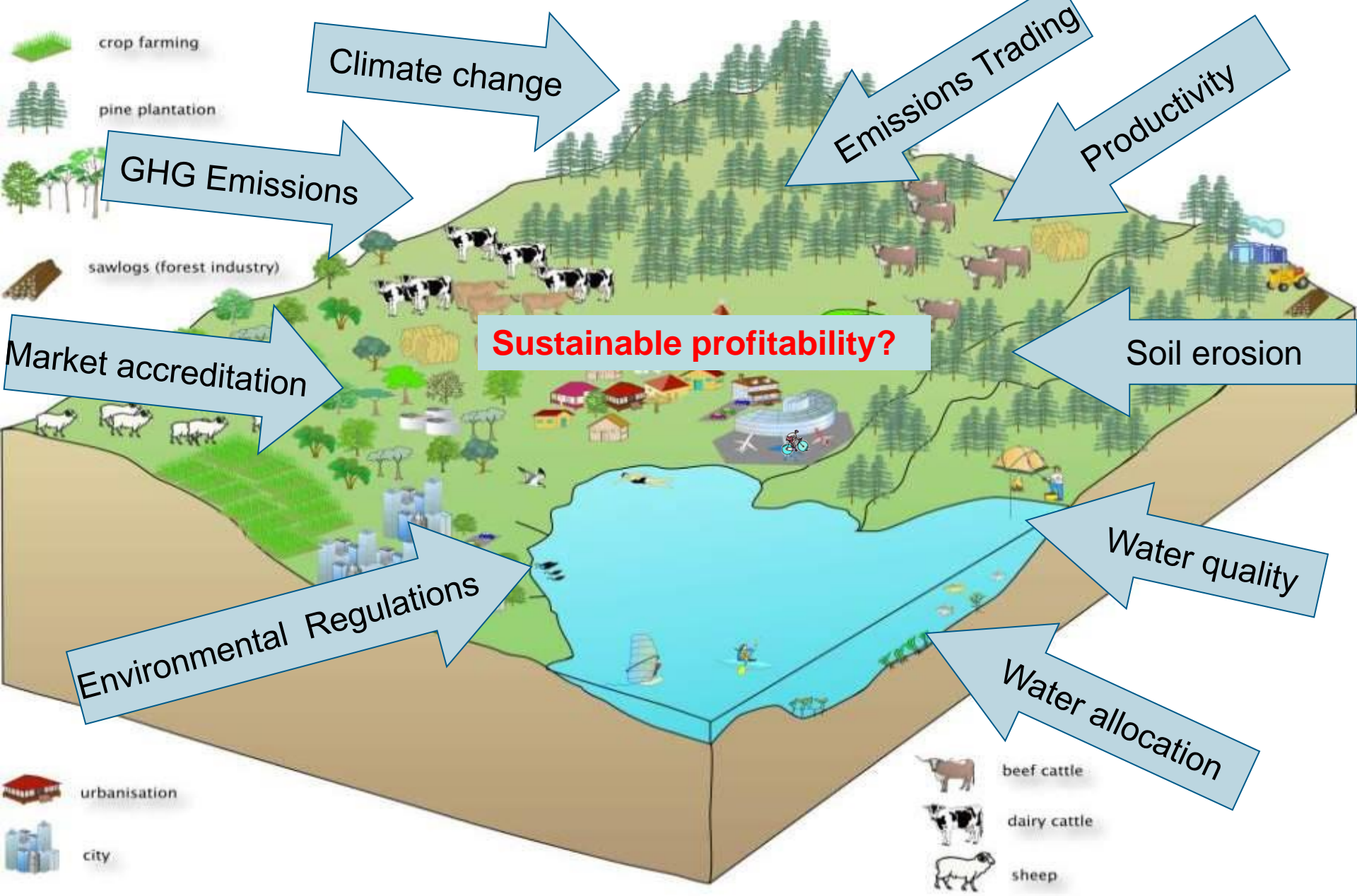


Evaluating forestry as a land use opportunity

Graham West & Warren Webber
Lake Rotorua StAG, 15 July 2014



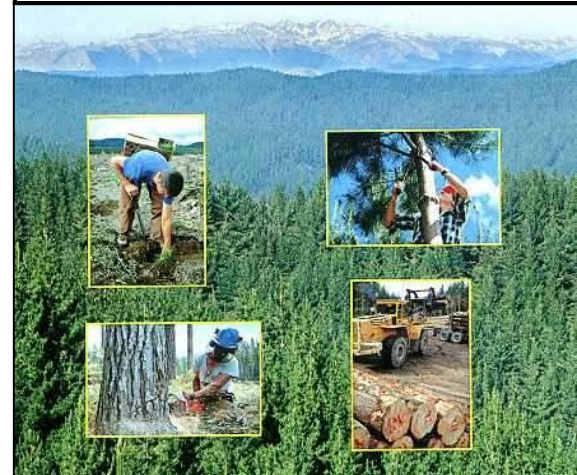
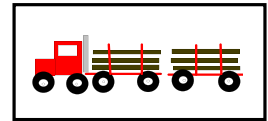
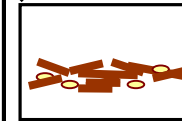
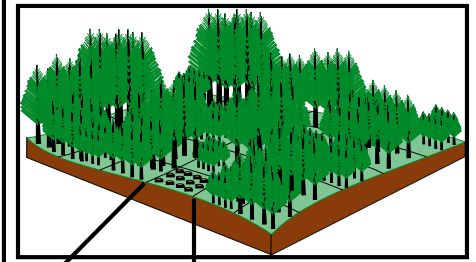
Background: Forestry fits with multiple land use issues



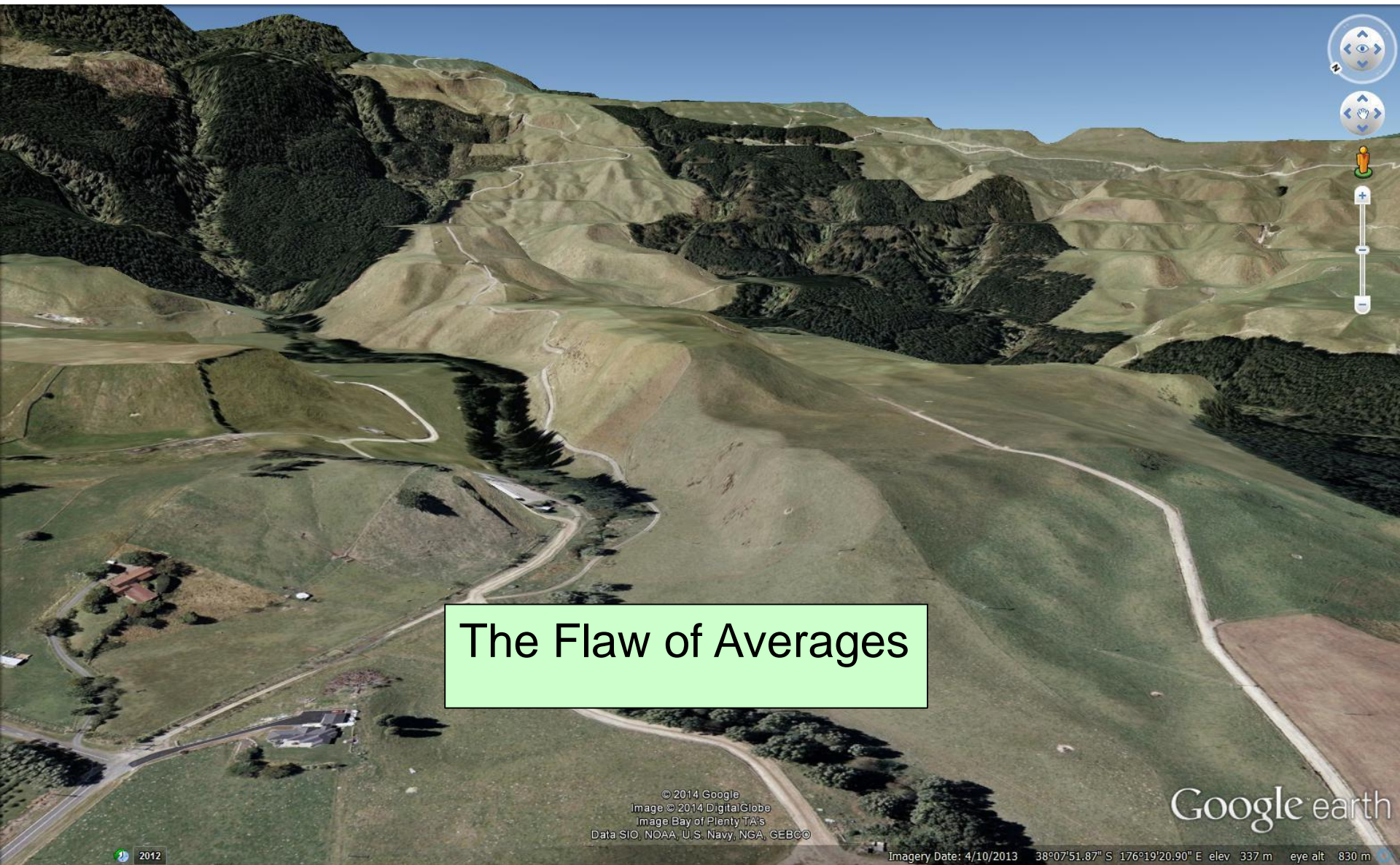
Forestry specific issues not in Farmer Solutions Project

- Location – slope, roading, waterways
- Timing – planting rate, tending, harvest
= Farm Forestry business model
- Productivity, Regional wood supply, succession planning
- Target market, Tax minimisation
- Aesthetics – species, mosaics, planting rows, boundaries

Acknowledged in PAC FSP 2.20.7



Planning of forestry in the landscape



The Flaw of Averages

© 2014 Google
Image © 2014 DigitalGlobe
Image Bay of Plenty TIA's
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Imagery Date: 4/10/2013 38°07'51.87" S 176°19'20.90" E elev 337 m eye alt 830 m

2012

What target market for end products

- Solid wood – lumber, posts & poles
- Engineered – Laminated beams, LVL, CLT
- Panels – MDF, particle Board, Plywood
- Fibre – export pulp, tissues, newsprint, packaging
- Extractives – transport fuel, tall oil, cleaning products, disinfectants, inks, fragrances, soaps
- Health products - Antioxidants & anti-inflammatory bioflavonoids from bark www.enzogenol.com



New directions in forest production

Environmental services:

- Conservation of biodiversity
 - Water quality
 - Flood protection
 - Soil stability
 - Recreation
 - Carbon storage
- >>> Economic frameworks developing to monetarise these services e.g. ETS

Feedstocks for new industries:

- Biofuels, bioproducts and biorefineries

Likely to drive species diversification and new forest management systems



In 1 cubic metre of wood there is:

- 0.5 m³ Lumber or Fibre
- 650kg CO₂ gas
- 6.9 Gigajoules of heat (\$300 electricity)
- 95 litres biodiesel
- 140 litres ethanol



Tools : Consider the spatial and temporal scale

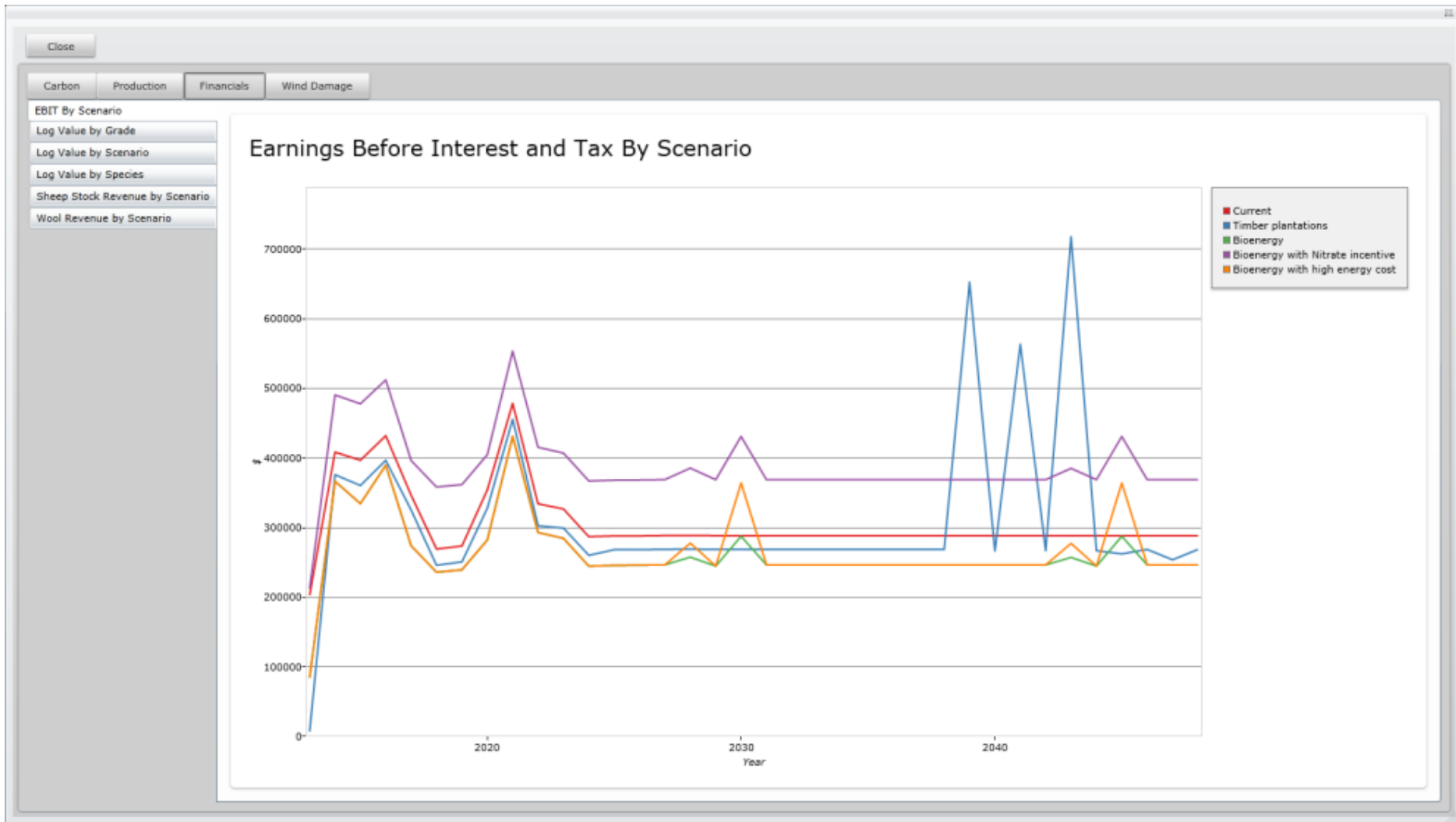
Spatial scale

Temporal scale

		Property	Catchment	Regional	National
<1 year	Operational	P-Plus Where's my Cows TracMap	GLEAMS	NA	NA
1-3 Years	Tactical	Farmax, Overseer	ROTAN LUCI	LUMASS	LURNZ LSM
3-30 years	Strategic	MyLand	CLUES NZFarm	LURNZ	LURNZ LSM

N Reduction is a strategic decision

The bottom line: Long term cash flow for whole property



Summary

- Forestry provides a broad range of future positive outputs that should not be evaluated as a 1 year event using today's prices
- Forestry has specific requirements in location and timing that cannot be generalised into an average per ha analysis
- Farmer Solutions Project study is a beginning & informs “critical discussion”
- Information on the forest options may need better communication?

Webber presentation

EFS - Pastoral Farming

DAIRY		2010 base @ 56kgN
Effective Grazing Area		200
Cows in milk 15 Dec		550
Milking cows per ha		2.75
Milk Production (kg MS)		170,500
kg MS / ha		853
Gross Farm Revenue (GFR)	\$	1,105,376
GFR / ha	\$	5,527
Gross Farm Expenditure (GFE)	\$	722,390
GFE / ha	\$	3,612
EFS	\$	382,986
EFS / ha	\$	1,915

DRYSTOCK		2010 Base @ 16kgN
Effective Grazing Area (ha)		400
Stock units wintered		4786
Stock units / ha		12
Sheep su		2645
Lambing %		125
Wool Weight (kg)		4.7
Sheep death %		6
Cattle su		2141
Calving %		90
Cattle death %		1
Gross Farm Revenue (GFR)	\$	465,856
GFR / ha	\$	1,165
Gross Farm Expenditure (GFE)	\$	371,947
GFE / ha	\$	930
EFS	\$	93,909
EFS / ha	\$	235

FORESTRY LEASE

- Historical \$150/ha p.a.
- Recently quoted \$200/ha p.a.

Beef + Lamb New Zealand Economic Service					
Sheep and Beef Farm Survey - Performance Indicators Per Farm Analysis					
Class 4 N.I. Hill Country - New Zealand					
	2009-10	2010-11	2011-12	Provisional 2012-13	Estimate 2013-14
Financial Indicators					
Economic Farm Surplus \$ per hectare	29.59	129.36	234.71	70.14	147.46
Rate of Return on Total Farm Capital %	0.3	1.3	2.5	0.7	1.6
Equity as % of Total Assets	73	72	74	73	74
© Beef + Lamb New Zealand Economic Service 2014					

FSP Report

Table 2: NPV analysis of commercial plantation *Pinus radiata* forestry in the Rotorua district (Source: BOPRC, PF Olsen, Perrin Ag Consultants Ltd)

	FORESTRY INVESTMENT - CLEAR WOOD MANAGEMENT REGIME												
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12 - 27	YEAR 28
AREA to be replanted (ha)	1												
Pre-plant release	\$ 833												
Supply, plant and release	\$ 667												
Releasing													
Survival and Releasing Assessment		\$ 8											
Pruning					\$ 800	\$ 800	\$ 800						
Thinning								\$ 800					
Management/Protection/Maintenance													
Mapping & Stand Records	\$ 27	\$ 2	\$ 1	\$ 1	\$ 49	\$ 10	\$ 10	\$ 10	\$ 2	\$ 2	\$ 2	\$ 2	2
Fire Levy & Water Points			\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	\$ 2	2
Forest Health & Dothistroma Control			\$ 4	\$ 4	\$ 22	\$ 4	\$ 4	\$ 24	\$ 4	\$ 4	\$ 4	\$ 4	4
Pest & Weed Control	\$ 18	\$ 18	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	7
Property Maintenance	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	5
Road & Track Maintenance	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	\$ 5	5
Insurance	\$ 5	\$ 10	\$ 10	\$ 10	\$ 10	\$ 15	\$ 15	\$ 15	\$ 15	\$ 15	\$ 15	\$ 15	15
Rates	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	100
Management	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	\$ 7	7
Total cost \$ per Hectare	\$ 1,667	\$ 155	\$ 141	\$ 141	\$ 1,007	\$ 956	\$ 956	\$ 976	\$ 147	\$ 147	\$ 147	\$ 147	\$ 147
TOTAL COST	\$ 1,667	\$ 155	\$ 141	\$ 141	\$ 1,007	\$ 956	\$ 956	\$ 976	\$ 147	\$ 147	\$ 147	\$ 147	\$ -
estimated stumpage(net log revenue)/ha													42,000
TOTAL INCOME	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 42,000
CASHFLOW	-\$ 1,667	-\$ 155	-\$ 141	-\$ 141	-\$ 1,007	-\$ 956	-\$ 956	-\$ 976	-\$ 147	-\$ 147	-\$ 147	-\$ 147	\$ 42,000
capital for land													\$ -
TOTAL CASHFLOWS	-\$ 1,667	-\$ 155	-\$ 141	-\$ 141	-\$ 1,007	-\$ 956	-\$ 956	-\$ 976	-\$ 147	-\$ 147	-\$ 147	-\$ 147	\$ 42,000
NPV	\$4,703.51												
discount rate	5.0%												
internal rate of return	7.84%												
NPV per ha	\$4,703.51												
Equivalent annuity over 28 years	\$315.71												
Current forestry right payment	\$150.00												

Annual Annuity = \$316/ha p.a.; NPV= \$4,704
Nil Carbon, Nil Incentives, Nil rental paid

FSP Replicate – no carbon, no incentives grant

Example Drystock		30 yrs	1ha		PER HECTARE (PRUNED REGIME)				
Converted Areas	ha	Grant	Establish (Yr1)	Release (Yr2)	Prune 1 (Yr5)	Prune 2 (Yr7)	Prune 3 (Yr8)	Prune 3 (Yr9)	Sales (Yr30)
ex Established Gorse	0	\$0	\$3,500	\$200	\$900	\$700	\$500	\$700	\$40,000
ex 50:50 Gorse & Pasture	0	\$0	\$2,500	\$100	\$800	\$600	\$400	\$600	\$42,000
ex Pasture	1	\$0	\$1,500	\$50	\$800	\$600	\$400	\$600	\$44,000
Total converted (ha)	1								
Unavailable Area	50								
Total Area Assessed (ha)	51								
					Total rates				
					\$100				
									30YEAR RETURNS
									Grants Received
									\$0
									Timber Sales
									\$44,000
									Carbon Revenue
									\$0
Perrin Base Annual Annuity			Interest Rec'd	Interest Paid	Rates p.a.	Mgmt per ha			
			5.00%	10.00%	\$100	\$7			
Carbon (simple average)					Annuity/ha/yr	Simple av/ha/yr			
Grant (simple average)	Per ha / yr		\$150		\$300	\$1,178.63			
	Land-owner Payments					\$150.00			
	Per year		\$150		\$150	\$1,028.63			
									Net Total BASE Return
									\$35,359
									<i>less Landowner Payments</i>
									-\$4,500
									After Landowner Payment
									\$30,859
									NPV
									5.00%
									\$4,605
									\$2,299

Cashflow negative throughout, even with landowner payments @ nil/ha p.a. (demo)

Carbon



NZCF Ltd

- av. \$171/ha p.a
- subject to area cap
- 25yrs min. term
- expires 30/09/15

Carbon Lease – Terms Sheet

Offer Date: 1 July 2014

Property Description: BOP Regional Council Land Use Change Programme

Owner/Lessor: TBC

Lessee: Subsidiary of New Zealand Forest Leasing Limited.

Total Eligible Hectares: 100ha (minimum)

Age Class: New plantings

Variety: Radiata (clearwood tending regime).

Lease Term: 25 years (minimum)

Lease Start Date: Year of planting

Annual Rental: Ramp up to \$205 per eligible hectare p/a + GST (see table below).

Payment table: Payable on 31 AUGUST (annually)

YEAR	RENTAL
Planting year + 1 years	\$20/ha
Planting year + 2 years	\$40/ha
Planting year + 3 years	\$75/ha
Planting year + 4 years	\$115/ha
Planting year + 5 years	\$160/ha
Year 6+	\$205/ha

Carbon Insurance: Arranged and paid by NZFL from lease start date.

Conditions:

1. The owner being satisfied with the terms of the lease and legal opinions.
2. Registered lease on the terms of this letter of offer.

This offer remains open for acceptance until 30 September 2015 but is subject to there still being space in our Lease Programme.

New Zealand Forest Leasing Limited
by Andy Martin

Accepted on behalf of the owner
by Authorised Signatory

**So ... add the Incentives Grant
& Carbon Contract**

Assumptions

1. Overseer 5 scenarios + NDAs at 35/13 for dairy/drystock
2. Hence 10kgN/ha to sell for drystock; ca.30kgN/ha for dairy
3. 'Below-line' N price approx. \$400 per kg
 - limited land supply will limit market tension
 - hence, **\$4000/ha for drystock; \$12,000/ha for dairy**
4. Carbon offer averaging \$171/ha over a 28 year cycle
5. No allowance for land value depreciation
 - will address this subsequently

FSP Replicate + carbon + incentives grant

ex DRYSTOCK (1ha)

Example Drystock	30 yrs	1ha		PER HECTARE (PRUNED REGIME)					
Converted Areas	ha	Grant	Establish (Yr1)	Release (Yr2)	Prune 1 (Yr5)	Prune 2 (Yr7)	Thin (Yr8)	Prune 3 (Yr9)	Sales (Yr30)
ex Established Gorse	0	\$3,000	\$3,500	\$200	\$900	\$700	\$500	\$700	\$40,000
ex 50:50 Gorse & Pasture	0	\$3,500	\$2,500	\$100	\$800	\$600	\$400	\$600	\$42,000
ex Pasture	1	\$4,000	\$1,500	\$50	\$800	\$600	\$400	\$600	\$44,000
Total converted (ha)	1								<i>Average Timber Sales/ha: \$44,000</i>
Unavailable Area	50			Total rates	30YEAR RETURNS				
Total Area Assessed (ha)	51			\$100			Grants Received	\$4,000	
Perrin Base Annual Annuity		Interest Rec'd	Interest Paid	Rates p.a.	Mgmt per ha	Timber Sales		\$44,000	
Carbon (simple average)		5.00%	10.00%	\$100	\$7	Carbon Revenue		\$4,920	
Grant (simple average)	Per ha / yr	Annuity/ha/yr			Simple av/ha/yr	Net Total BASE Return			
		\$150	\$699		\$1,476			\$44,279	
	Land-owner Payments				\$150	less Landowner Payments		-\$4,500	
	Per year	\$150	\$549		\$1,325.97	After Landowner Payment		\$39,779	

NPV
5.00%
\$10,752
\$8,446

Cashflow remains positive only if landowner payments are nil (demo)

NPV & Annual Annuities

Summary of Contribution to Improving Annuity

	Mgmt	Rotation	Carbon	N Grant	NPV \$/ha	Annual Annuity \$/ha/yr	Partitioned Annuity \$/ha/yr	
Drystock example					\$3,613	\$235		
Dairy Example					\$29,438	\$1,915		
Drystock Forestry Conversion Scenarios								
Radiata pine plantation	Pruned	30	N	N	\$4,605	\$300	\$300	Forestry base line
Radiata pine plantation	Pruned	30	Y	N	\$6,942	\$452	\$152	From Carbon
Radiata pine plantation	Pruned	30	Y	Y	\$10,752	\$699	<u>\$248</u>	From N Grant
							<u>\$699</u>	
Dairy Forestry Conversion Scenarios								
Radiata pine plantation	Pruned	30	N	N	\$4,605	\$300	\$300	Forestry base line
Radiata pine plantation	Pruned	30	Y	N	\$6,942	\$452	\$152	From Carbon
Radiata pine plantation	Pruned	30	Y	Y	\$18,371	\$1,195	<u>\$743</u>	From N Grant
							<u>\$1,195</u>	

Summary

1. The greatest opportunity is for legacy land
2. EFS for average NZ drystock farm in last 5 years has ranged from \$30-\$235 /ha; dairy approx. \$1,915/ha
3. FSP annual annuity projection for forestry was \$316 /ha
4. *In addition* there is a medium-term carbon opportunity of \$171/ha – *this is capped and will expire*
5. *In addition* there is an incentive grant opportunity which could be as high as \$4,000 /ha for a property with an NDA of 13kgN/ha
6. A pruned regime + carbon + incentive = \$699/ha (ex drystock); \$1,195/ha (ex dairy) *with capital impact in addition*
7. **‘The early-bird will get the worm’**

Thank you