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Valuing natural forests

NewForests
Asset Management • Advisory • Ecological Products

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ITTO Tropical Forest Investment Forum

The science of forest valuation
Quantifying the forest

And then the art – we create a model of reality

Enchanted forest by Emilia Tan www.tmsart.com

Quote from Dr Josef Leitmann ‘Our institutional perspectives influence how we see the world’ – certainly affects how we value it. What do we include in our model?

- Same forest + different valuer = different value
- Yes, accurate forest measurements are important. But did we measure the right things?
- Great information + inappropriate model = bad valuation

Quote from Dr Appanah ‘If you don’t have the appropriate forest valuation system, you make bad decisions’

Net Present Value

- A cashflow with costs and revenues over a period of time (<40 years)
- A discount rate (puts a value on the timing of revenues)

Gives the net present value – an estimate of the market (fair) value

‘amount for which an asset could be exchanged between knowledgeable, willing parties in an arm’s length transaction’

IAS 41 International Accounting Standard

Example cashflow

Natural forest example

Year	0	1	2	3	4	5	6	7	8	9	10
Area cut (ha)	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
all $('000s)											
Costs	800	800	800	800	800	800	800	800	800	800	800
Revenues (loaded on barge)	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Net revenues	700	700	700	700	700	700	700	700	700	700	700
Discount rate	15%										
Discounted revenues	700	610	530	460	400	350	300	260	230	200	170
	700	670	630	600	580	550	520	500	470	450	430
Net present value	4210										

How to choose a discount rate?

Due to the long time frames, discount rates have a big impact on the forest value. The choice of discount rates is important

Methods: WACC-CAPM; Implied from forest sales

All methods involve more art than science

US, Australia, NZ – 5 to 8% applied to a real post-tax cashflow

South-East Asia – 12 to 20% applied to a real post-tax cashflow

Real or nominal cash flow?

- A common valuation error is inconsistency with the treatment of inflation
- ‘Real’ means that the effect of inflation is excluded
- ‘Nominal’ means that the effect of inflation is included

Real cash flows are best; can still have real price increases

Tax

- Different countries have different tax regimes – and these can make a big difference to the actual net profit the forest owner makes
- Take tax into account when making cash flows for forest valuation
- Use discount rates appropriate for post-tax cash flows

Liquidation Method

Merchantable wood in the forest at the valuation date

multiplied by

(Log prices less production costs)

Ignores time

Natural forest example	('000s)										
Year	0	1	2	3	4	5	6	7	8	9	10
Area cut (ha)	100000										
all $('000s)											
Costs	8000										
Revenues (loaded on barge)	15000										
Net revenues	7000	0	0	0	0	0	0	0	0	0	0
Discount rate	15%										
Discounted revenues	7000	0	0	0	0	0	0	0	0	0	0
Net present value	7000										

A real example

- Mature hardwood plantations and natural forest
- Huge volume – natural forest volume> national AAC
- No existing harvest or transport capacity
- Estate value was a liquidation value – twice the NPV
- Valuation was for a listed company
- Accepted as compliant with International Financial Reporting Standards
- Timber grossly overvalued; forest services not valued

- Two of Australia's state forest agencies use this method too

'If you don't have the appropriate forest valuation system, you make bad decisions'

Conclusion on liquidation method

Don’t use it for natural forest valuations unless the whole forest could be cleared within a year of the valuation date

What revenues?

Traditionally timber is the source of revenue

Timber value?

At New Forests we've done some recent comparisons of natural forest revenue streams –

A significant source of data was:

Jarvis, B. and Jacobson, M. (2006) "Working paper – Incentives to promote forest certification in Indonesia" Project: Motivating Sustainability,

Prepared for Moray McLeish, International Finance Corporation PENSA. Final draft. Indonesia April 2006.

What is the approximate value of a logging concession – to the concession holder?

Net present values for various forestry management scenarios
250,000 harvestable ha estate (plus 250,000 ha not harvested)

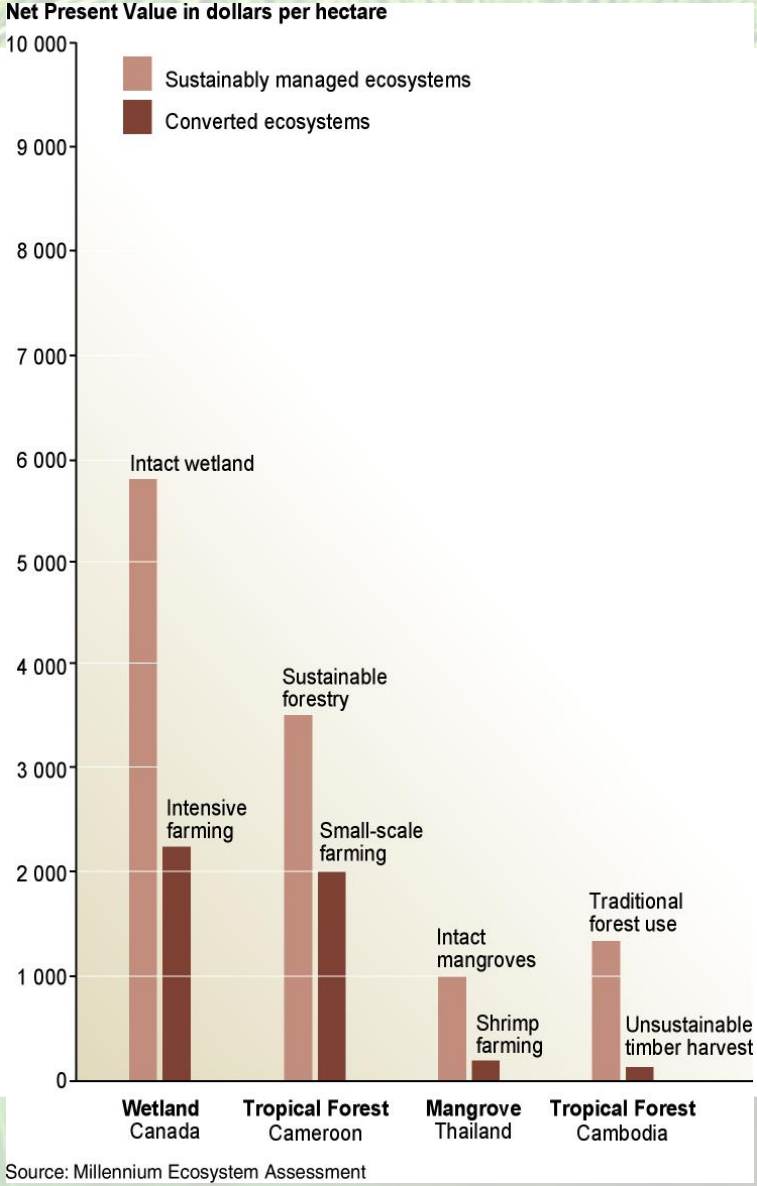
Scenario	Harvest Lifespan (years)	Area Logged Per Annum (ha)	Revenue per m^3 (US$)	NPV of Cash Flows (15%)	NPV of Cash Flows (20%)
Sustainable Harvest	perpetuity	12,500	30	**US$50 million**	US$37 million
Unsustainable harvest	20	12,500	70	**US$110 million****	US$85 million
	10	25,000	70	US$175 million	US$147 million

Net present value of the concession to government (royalties etc) – **US$31 million

Little incentive for sustainability
The result is forest degradation

HPH concession – South Kalimantan.

Value from who's point of view?



Potential Value of Tropical Forest Ecosystems

- Regulated U.S. markets for biodiversity and wetlands trade over US$1 billion annually
  - US$3000-125,000 for 0.4 ha with a breeding pair of endangered species
  - US$10,000 to $350,000 per hectare for wetlands

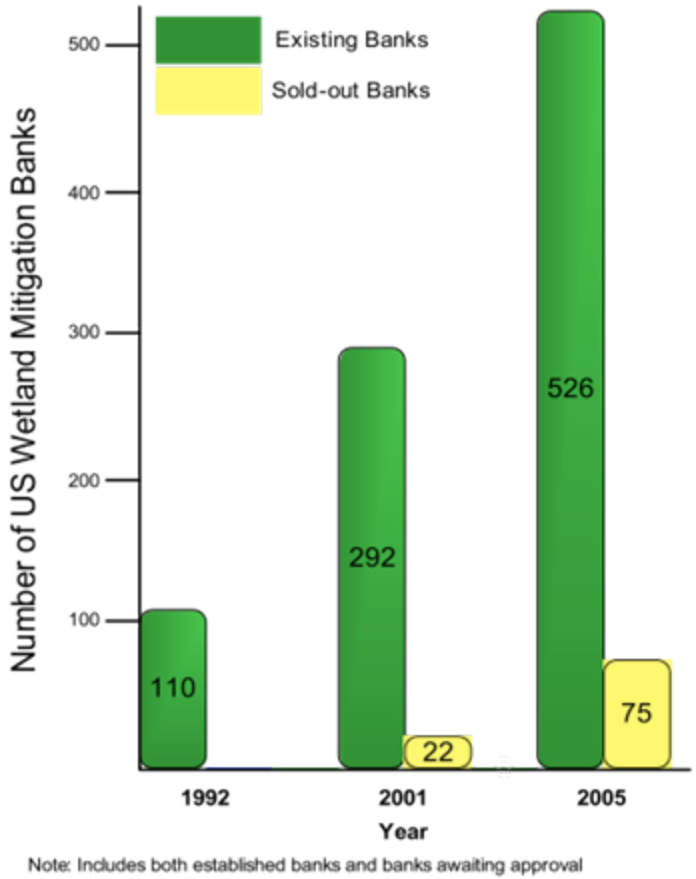
Least Bell's Vireo
$125,000 per pair

U.S. Experience with Endangered Species Banking

- Endangered species banks are accredited under rules promulgated by U.S. Fish and Wildlife Service under the Endangered Species Act
- Development (e.g. real estate, highways, military bases) that harms endangered species or their habitat must be mitigated by preservation and enhancement credits purchased within a “service region”
- Approximately 100 banks are in operation with turnover in credits of $US300 million per annum
- Most banks are owned by private developers who then donate the land to an NGO or government agency after credits are “sold out”
- Trust funds cover perpetual future management costs

Growth in Wetlands Banking

- U.S. wetland mitigation banking is worth $1 billion per annum[2]



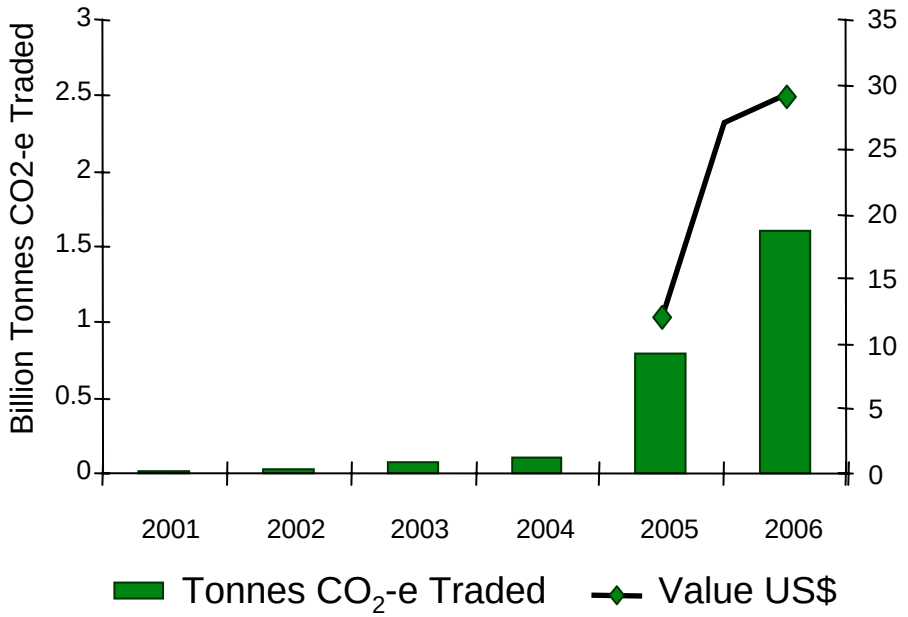
Source: http://www.epa.gov/owow/wetlands/facts/fact16.html

(1) Environmental Law Institute. 2005 Status Report on Compensatory Mitigation in the United States. Washington, D.C

(2) Forest Trends (2007) http://www.forest-trends.org/documents/press/releases/Forest_Trends_EM_Release_FINAL_FINAL.pdf accessed 07.12.2007

Growth in the Global Carbon Market

The global carbon market was worth approximately US$12 billion in 2005 and was valued at US$29 billion in 2006; continued growth is forecasted in 2007

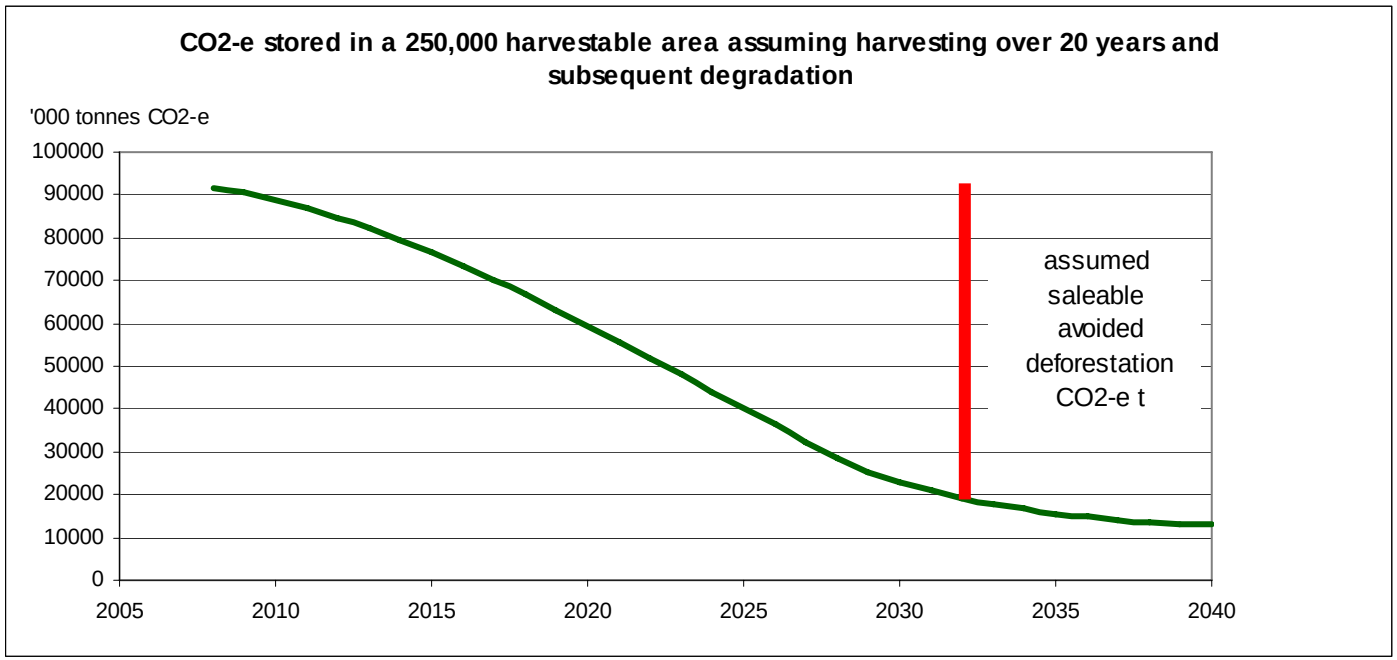


Source: Point Carbon (2007): Carbon 2007 - A new climate for carbon trading" Røine, K. and H. Hasselknippe (eds.) 62 pages.

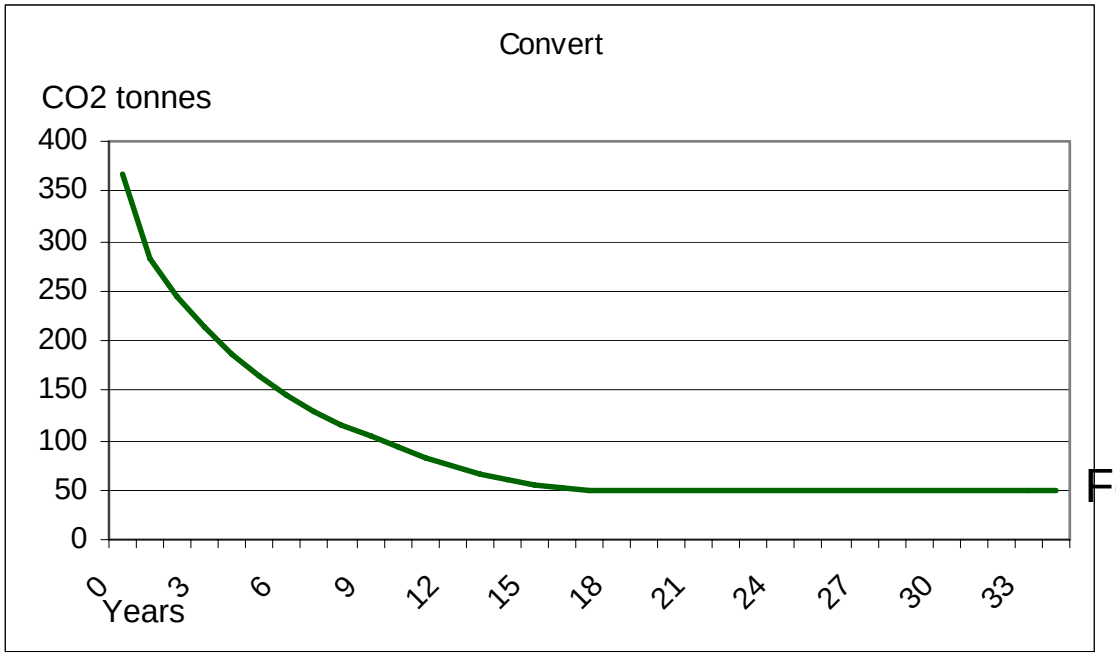
Potential Value of Carbon

- Strong support emerging internationally for avoided deforestation as part of the global carbon market. Australian government is looking at options for funding avoided deforestation in this part of the world
- DR Congo is looking to cancel 12-15 million hectares of concessions (half of current allocation) through G8 financing and suggests that this will provide up to $US8 billion per annum in new funding

Avoided deforestation



Avoided deforestation



For the harvested area

For one hectare: assumed loss of carbon (CO2 tonnes) following harvesting

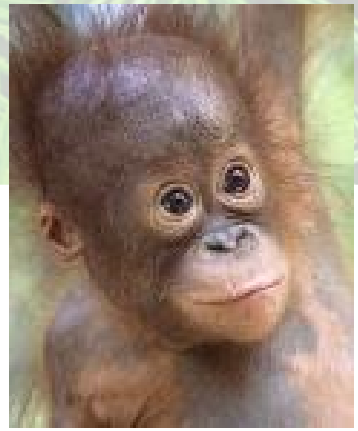
Carbon sales scenarios modelled

- Scenario 1 – Forward sale of all the credits generated from avoided deforestation. Sale spread over period 2009-2013. US$2.95/CO2-e t
- Scenario 2 – Annual sale of credits generated in previous year. Voluntary market pre-2012 – US$10.00/CO2-e t. Then Kyoto market US$18.00/CO2-e/t
- Scenario 3 – No sale of credits generate prior to 2012. Five yearly sales for the carbon credits generated in the previous five years. First sale in 2017. US$18.00/CO2-e t.

Results of modelling

Scenario	Description	Net Present Value of 250,000 harvestable hectare concession
Baseline	Unsustainable logging practices	Concession holder US$110 million Government US$ 31 million
1	Forward carbon sale over five years at discounted price	US$129 million
2	Annual carbon sale from 2009	US$227 million
3	Five yearly sale from 2017	US$138 million

Charismatic carbon

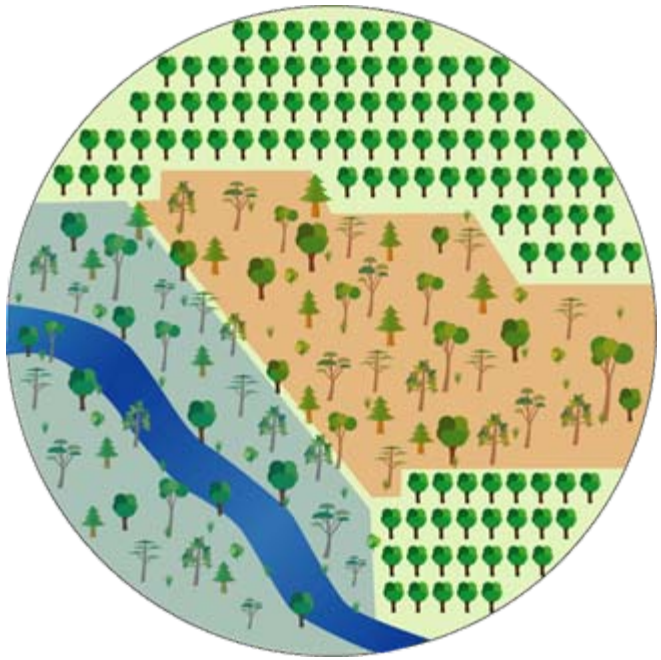


The high biodiversity, social and cultural values of this region's forests makes for "charismatic carbon" . Some buyers will pay more for this kind of carbon.

PRODUCT	**Industrial Carbon**	Kyoto Carbon			Greenhouse Friendly	Gold Standard Kyoto	**Charismatic Carbon**
	Increasing complexity = layers of value						
QUALITIES	3rd Party Verified	Kyoto Baseline	Permanence	Environ. Benefits (i.e. FSC)	Financially Additional	Biodiversity Benefits	Social Benefits

Sustainable land uses have struggled to compete with economic forces driving deforestation

Emerging markets are changing the economics of tropical forestry management



Ecosystem services	Ecological products
Carbon sequestration	Kyoto-compliant carbon credits Retail carbon credits Voluntary carbon credits
Biodiversity conservation	Avoided deforestation Wildlife corridors Species populations Mitigation/conservation bank Ecotourism
Water quality	Riparian zone protection Up-stream erosion control River & fisheries health Nutrient loads

About New Forests

- Forest investment management and advisory services company with offices in Sydney, Australia and Washington, DC
- Asian office, probably located in Singapore planned for late 2008
- Most of New Forests investments include timber plus eco-assets (carbon, salinity control, biodiversity) but increasing focus on eco-assets as direct investments
- Approximately US120 million in assets under management. Europe and US investors. US110 million to spend in Southeast Asia right now and more promised.
- Consulting service – specialising in eco-assets – valuation, policy, strategy

Some current projects

- **KFPL in Solomons**

  12,000 ha plantations; 8,000 ha production forests (10% of 2007 volume); 25,000 ha natural forest reserve. Demand for local provenance Paraserianthes seed. EIB soft loan.

- **Forest land in NSW, Australia**

  Carbon credits sold into NSW GGAS scheme

- **Afforestation project in Australia**

  Salinity control payment; future carbon credit sales

- **Timber plantations in New Zealand and Hawaii**

All projects are FSC certified

Some projects in development

- **Sabah, Malaysia – Biodiversity bank**

  Rehabilitation of degraded natural forest creating biodiversity offsets – target market includes

  oil palm plantation developers

- **Indonesian greenfield developments**

  Natural forest on the properties potentially has value for avoided deforestation credits – sale into proposed Australian carbon emissions trading scheme (2011)

  ENGOS with special interests (e.g. tigers) willing to fund rehabilitation and protection

So..

Grounds for optimism

Log prices are increasing and the environment is right to create new revenue streams

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