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SINO-FOREST CORPORATION

Background Papers accompanying the 31 December 2011 Valuation of Sino-Forest's China Forest Assets

PÖYRY
Engineering balanced sustainability™

The cover photo shows a stand of Eucalyptus grandis x urophylla in Guangxi province. This stand was measured in January 2011 at age 5 years. Mean stocking was 1 250 stems/ha, mean height 18.2 m, and mean DBH 13.8 cm. Total standing volume is 165 m^3/ha.

PREFACE

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The report contains background papers that were used by Pöyry to develop its opinion on the market value of SFC's China Forest assets as at 31-December 2010. The provision of this report is subject to the terms of the Disclaimer provided on the following page.

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CONTENTS

1 INTRODUCTION

The following materials provide additional background to support the individual summary reports of Pöyry's 31 December 2010 valuation.

2 RISKS TO FOREST ASSETS

In addition to risks relating to the cash flow assumptions there are other risks associated with management of a biological resource such as a forest. In the SFC Forest estate the key identifiable risks include:

- Fire
- Snow/Frost
- Pest and Disease
- Storms and Typhoons.

2.1 Fire

Fire has not been a major threat in South China plantation forests in the past. However, with the increase in eucalypt plantation area there is a correspondingly greater fire risk. This risk can be mitigated by the implementation of fire prevention techniques such as the construction of firebreaks inside plantations, the development of human resources trained in fire fighting and supported by physical infrastructure such as portable fire fighting equipment. Given that the resource is geographically fragmented and comprises discrete forest blocks that are generally less than 500 ha in size, the opportunity for a singular catastrophic event is remote.

It is evident from Pöyry's previous field inspections of SFC estate that in some regions farmers have used burning as a land preparation tool in the past. SFC has previously used fire to prepare land for planting but is moving away from this practice. Their aim is to reduce the loss of soil fertility that occurs when organic matter is volatilised and lost to the atmosphere.

Recently established and young stands are at greatest risk to fire damage as they are more likely to suffer crown damage that compromises their growth. In older stands close to harvest age, the impact of fire may be less significant as much of the timber may be salvaged and marketed with little discount.

SFC has advised Pöyry that it holds insurance cover for losses as a result of fire and other causes. We understand that cover is for 100% of the value of any area of forest lost, with the limitation that any annual claim may be no more than 15% of the whole estate value. Pöyry has not viewed the insurance policies.

2.2 Frost and Snow Damage

The risk of frost damage can be reduced by careful attention to site selection. Frost prone sites should be avoided and planting should be scheduled to coincide with favourable weather conditions.

Snow damage in southern provinces of China is expected to be a rare occurrence. However, an example of the extreme climate variations that are possible occurred in January 2008 when snowfalls in southern regions of China occurred, resulting in some forest damage across a number of southern provinces.

2.3 Typhoons

The coastal areas of Southern China suffer a number of typhoons each season during July to September. The forest damage is generally localised and confined to young age-classes, but every 20 years or so a typhoon is likely to cause significant damage. The area that is most affected is within 200 km from the coast. This risk is reduced by the short rotations of the eucalyptus plantations.

The stands inspected in 2009 in Guangxi and Guangdong showed no notable damage from typhoon activity.

2.4 Pests and Disease

As the area of single species plantations increases so does the potential risk of pest and disease problems. To date there appears to have been no serious pest or disease outbreaks in either SFC's plantations or any others. Bacterial wilt caused by *Ralstonia solanacearum*, has caused some mortality in eucalypt nurseries and in the field in another owner's forests in Guangxi Province. A gall wasp *Leptocybe invasa* has also caused leaf malformation in these same forests.

Bacterial wilt causes wilting, leaf drop, reduced growth and sometimes tree mortality. Seriously infected areas are treated by felling stems, sometimes removing the vegetative material, and replacing the soil in the planting holes. Attack by the gall wasp may be height related as trees over 2 metres in height appear to be less susceptible. The wasp injects its eggs into leaf tissue, which disrupts normal flows and physiology of the leaf, often resulting in the formation of galls. Although not a lot is known about the impact of the gall wasp, it is likely that photosynthesis and normal growth is affected.

Leaf eating caterpillars are controlled by the application of pesticide if levels of infestation are such that 30% of the crown is affected. Local Forest Bureaus maintain disease control stations and provide forecasts on pathogen levels and the need for control. In keeping with good forest practices, SFC plants trees produced from a number of different clones. This reduces the risk of a weakness or propensity for infection or attack by pests throughout an age-class or planting year, and also provides genetic diversity. The clones that have been planted to date have been assessed for resistance to disease.

3 LOG MARKET AND PRICE OUTLOOK

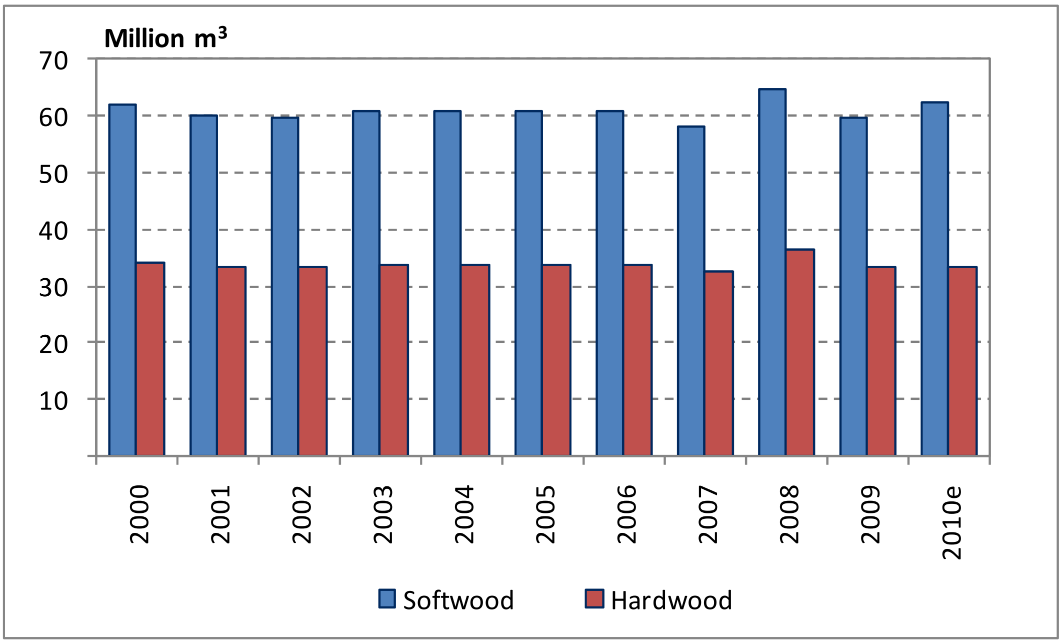
3.1 Domestic Log Supply

A series of floods in 1998 in China were blamed in large part on deforestation and uncontrolled harvesting programmes. It led to the central government significantly reducing timber harvests in natural forests and also increasing protection forests. Since then, the focus has shifted to plantation forests, and the total harvest has been relatively consistent during the 2000s.

Figure 3-1 presents China's domestic commercial and recoverable log supply. The 2010 total was estimated to be 96 million m³/a, of that, softwood represented 65%. In addition to the reported commercial volumes, it is understood that a large quantity recovered from non-commercial log production also ends up being utilised in various industrial sectors.

In the foreseeable future, there will be moderate increases of log supply from plantation forests but the growth is partially offset by continuing declines in harvesting of natural forests. As such, China's domestic log supply is forecast to remain consistent or increase moderately.

Figure 3-1:
China Domestic Commercial Log Supply

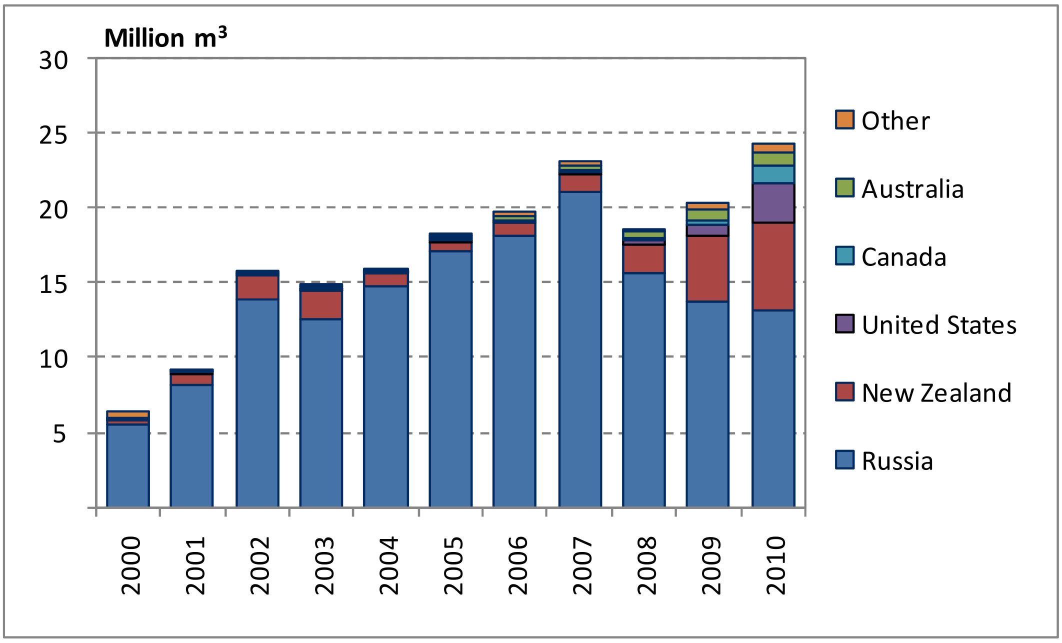


3.2 Log Import

China's softwood log imports have increased considerably over the past decade driven by the country's strong economic growth and an overall shortage of domestic wood. Russia has traditionally been the predominant supplier of softwood logs into China.

Figure 3-2 presents China's softwood log imports by origin. During 2010, China's softwood log import was 24.3 million m³, 20% higher than the previous year and the largest volume ever.

Figure 3-2:
China Softwood Log Imports by Origin



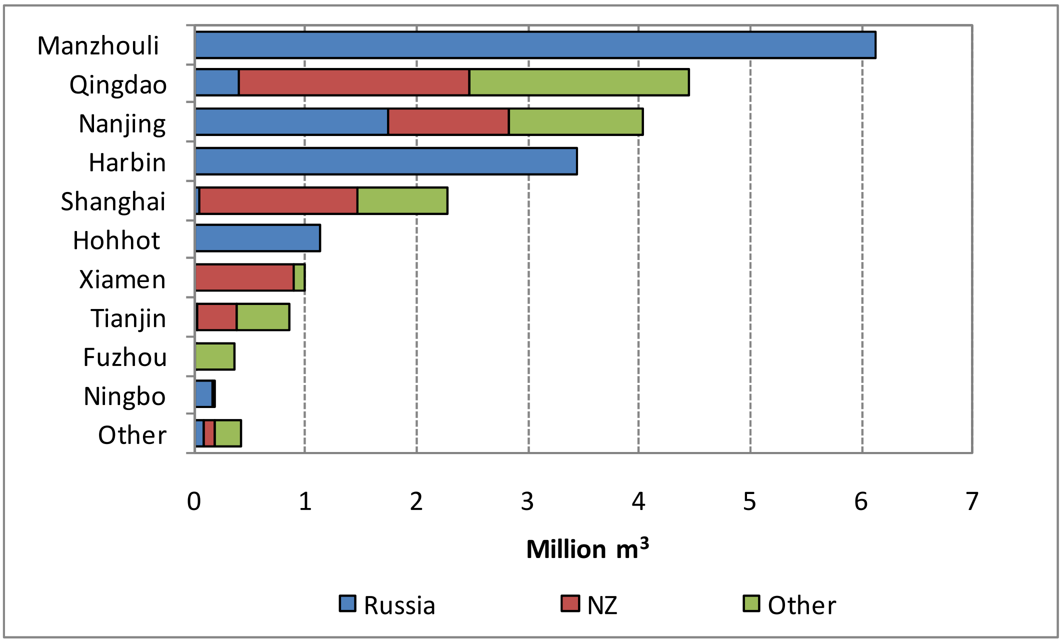
The decrease of softwood log imports during 2008 mainly reflected reduced volumes imported from Russia, which was triggered by the announcement of Russian log export tax rises, while the Chinese domestic demand also generally stabilised. The reduced demand in 2008/09 was also affected by the global financial downturn.

As an alternative to importing logs, China's softwood lumber imports have increased substantially in the latest years. This eventual shift is expected to continue, as the cost of imported Russian logs keeps increasing. Such structural changes have already become evident in the related industries that, until recently, relied heavily upon Russian log supplies.

Contrary to Russian supply, softwood log imports from New Zealand to China increased considerably during 2009/10. As a result, New Zealand's share of China's softwood imports increased to 24% in 2010, compared to 5% in 2007 and 10% in 2008. Russia's share on the other hand decreased further to 54% in 2010, compared to 91% in 2007 and 85% in 2008. It is also noteworthy that softwood log supplies from North America have recently been on the rise, reflecting in part the US construction market remaining sluggish.

Figure 3-3 illustrates China's softwood log imports by district (port) during 2010. This highlights the significance of the two major Chinese inland districts for timber imports from Russia, namely Manzhouli and Harbin, handling the majority of China's timber imports from Russia. It also shows that Qingdao, Shanghai, Nanjing and Xiamen were the main districts for the import of New Zealand logs.

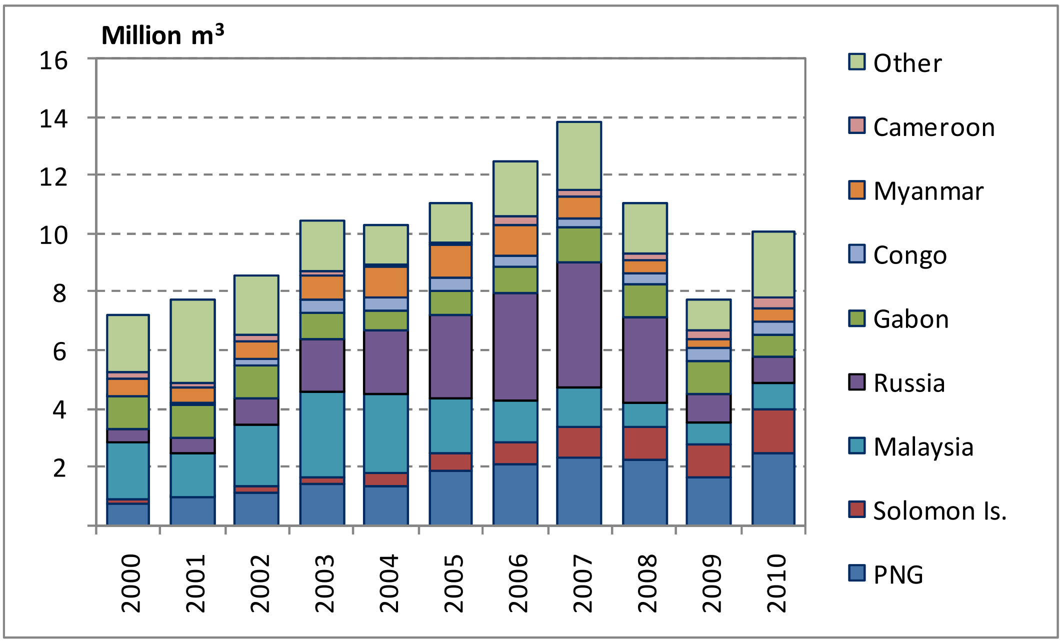
Figure 3-3:
China Softwood Log Imports by District (2010)



Also presented below in Figure 3-4 are China's hardwood log imports by origin. The volume had dropped notably since the peak in 2007, from 13.9 million m³ to 7.8 million m³ in 2009. The volume in 2010 however bounded back to just over 10 million m³.

The volumes from Russia and Malaysia have decreased notably in recent years. Supplies from Papua New Guinea (PNG), the Solomon Islands and Gabon have been comparatively consistent, positioning respectively as the first, second and fifth largest hardwood log suppliers into China today.

Figure 3-4:
China Hardwood Log Imports by Origin



3.3 End Use Industry Development

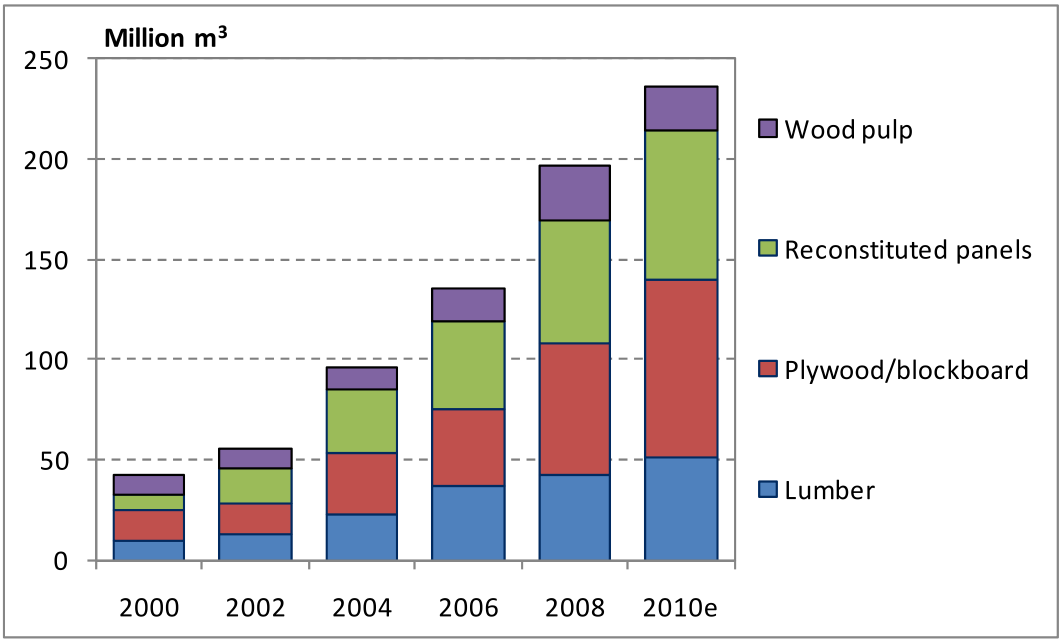
China's total domestic fibre demand, including non-industrial applications such as rural housing, mining, agriculture and fuel wood is currently estimated at 400-500 million m^3/a. Industrial uses represent some 50-60% of the total.

As presented in Figure 3-5, China's industrial wood consumption as of 2010 was estimated to be in the order of 230-240 million m^3, on a roundwood-equivalent (RWE) basis. Virtually all industries have contributed to the considerable growth experienced over the last decade.

Sawlog and peeler log demand is generated by domestic production of lumber, plywood/veneer and blockboard products. China has faced significant shortages in domestically produced quality saw and peeler logs, especially after logging bans from natural forests, and therefore depends a lot on imported logs.

In addition, China has been unable to supply sufficient pulp fibre from its domestic sources to the pulp industry. As a result, China has been a net importer of woodchip since 2006 and the imported volume has since grown considerably.

Figure 3-5:
China Industrial Wood Demand by End-use Industry (RWE)



3.4 Key Demand Drivers

China's economic growth in recent times has been phenomenal, averaging over 10%/a in the last decade in terms of annual GDP growth. The country has become the largest wood products consumer in the Asia-Pacific region, and the production of almost all types of wood products in China has increased at an exceptional rate during this period.

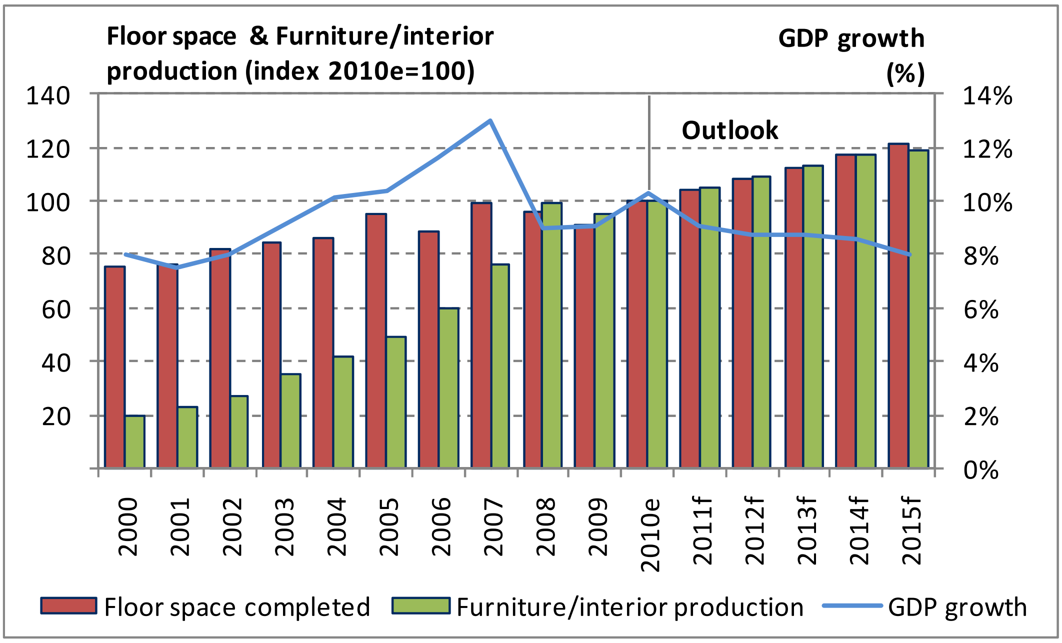
Continued urbanisation, massive government-led housing programmes, expectations of improved living standards, and the privatisation of the housing system have all been and will continue contributing to the strong construction activity. This has also driven expansion of the related manufacturing industries in

China, supported by the continued growth in the domestic economy and rising household incomes.

In addition, the impact of infrastructure investments by the government continues to be substantial, leading to strong medium-term demand for wood. The Chinese Government announced in November 2008 an RMB4 trillion (USD586 billion) stimulus plan to spur expansion in the economy and help sustain growth following the global credit crunch. The projects are still ongoing, generating massive demands for wood products.

The real GDP growth in 2009 was 9.1% and the growth in 2010 is estimated to have been 10.3%. The country's economic growth is forecast to gradually slow down after the significant period of expansion during the mid-2000s. The medium-term forecast from 2011 to 2015 is a stabilisation at around 8-9%/a.

Figure 3-6:
China Key Demand Drivers



China's construction activity was an estimated 2.4 billion m^2 in 2010 and is expected to reach 2.9 billion m^2/a by 2015. Investments in Chinese mills, aided by government incentives, have also led to a considerable expansion in value-added processing, such as furniture and interior decoration manufacturing.

China's interior decoration and furniture manufacturing industry has been expanding rapidly during the past decade, supported by construction industry growth, increasing household incomes and overall economic growth. China's interior decoration, furniture and flooring segments account for 40-50% of the total lumber consumed in the country today. In particular, growth in the furniture export business has been the most significant, founded upon the country's cost competitiveness in manufacturing.

Furniture/interior decoration manufacturing activity has been slower lately due to lower demand for finished products from export markets such as the US. However, in the longer term, the industry is forecast to continue growing at a steady rate albeit more slowly than experienced in the recent past.

3.5 Medium-term Market Prospects

Russia's log export tax is understood to remain at 25% at least during 2011. Depending on their accession into the World Trade Organisation, the tariffs may be reduced or eliminated in/after 2012. This could lead to their log export business regaining its momentum. However, the Russian government's strategic focus for their timber industries will continue to be on value-adding.

Nonetheless, the potentially affected industries that have traditionally relied upon Russian log supply have proactively been seeking solutions. This movement has already led to a new equilibrium of softwood log supply and demand in northern Asia, resulting in some major changes within the supply chain, as evidenced by the continued reduction in Russian log imports into northern Asia during the latest years. Furthermore, regardless of the tariff issues, increasing costs of production in Russia have started to have a measurable impact on supply into northern Asian markets and will continue to do so into the near future.

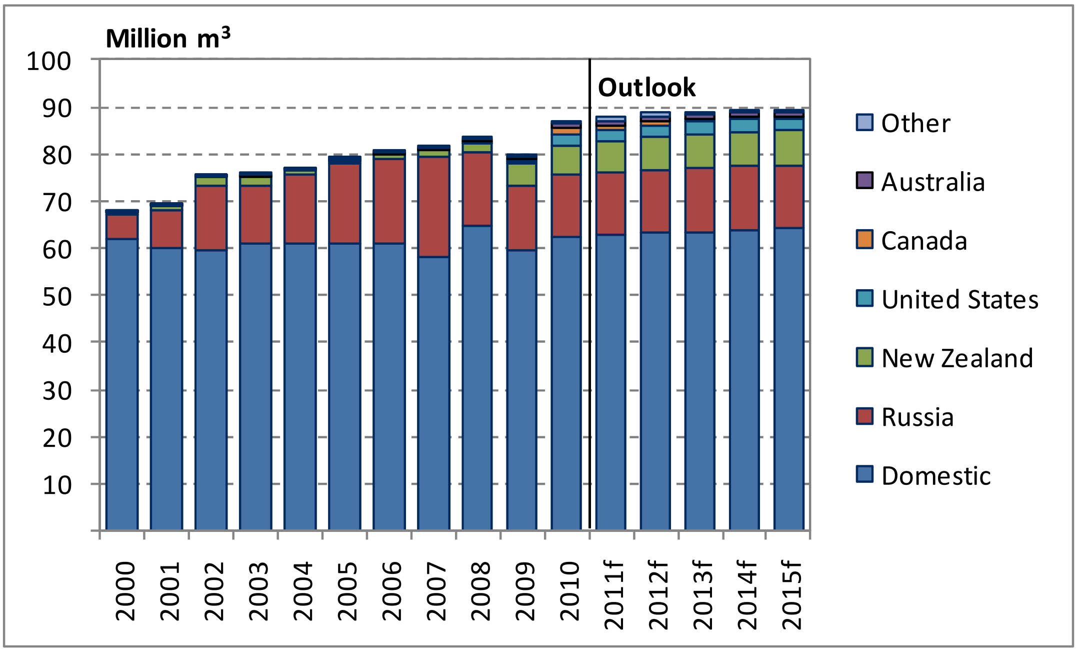
Going forward, the import of softwood logs from Russia will continue to decline as increasing production costs take effect. This Russian supply cost increase will result in other cost-competitive suppliers such as New Zealand and North America being potentially in a more competitive position to increase their supply into these markets.

The total softwood log supply in China is forecast to decrease gradually over the next decade, as imports of semi-processed or finished wood products increase over time. Despite the continued economic growth in China, this log supply outlook is effectively capped by realistic availability of raw material supply. The gap will eventually be filled by the increased import of processed products, utilisation of (plantation) hardwood, and substitution from wood to non-wood.

In terms of domestic timber supply, there will be some increases of softwood log supply from plantation forests but this is partially offset by continuing declines in harvesting of natural forests. As such, China's domestic softwood log supply is forecast to remain relatively consistent or increase moderately.

Figure 3-7 presents Pöyry's outlook for China's total softwood industrial log supply for the medium-term future.

Figure 3-7:
China Softwood Industrial Log Supply and Demand Outlook



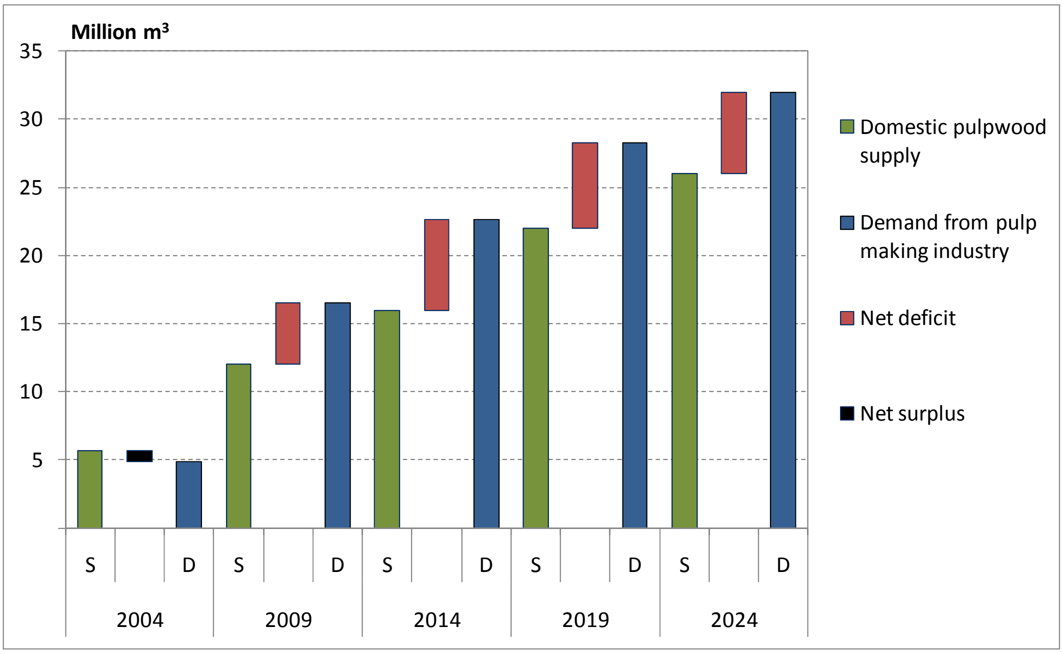
As for hardwood, a predominant portion of additional future demand will come from new pulp mill developments. Running parallel with the country's extensive pulp and paper industry development plans, China has an aggressive pulpwood plantation programme in place. It is difficult for large pulpmills in China to secure domestic fibre in sufficient quantities at affordable prices. As such, new pulpmill projects in China will not be approved unless they are supported by sufficient plantation development programmes. However, in reality, the lag between plantation development and increased pulpwood supplies, versus the timing of pulp production capacity expansion will underpin demand for hardwood woodchip imports in the short to medium term.

In time however, China could theoretically establish adequate hardwood plantations to supply the bulk of its own future industry needs. This would ease the anticipated shortage of fibre in the medium to long term, and could eventually lead to a decline in the country's woodchip imports in the longer term. It should be noted that this depends heavily on the respective large-scale pulp manufacturers' fibre procurement strategies, including whether they develop their own plantations in China or elsewhere, such as in south-east Asia.

How much of the planned pulpmill projects will actually be eventuated and how the associated domestic plantation programmes will be developed are difficult to predict. Acknowledging that, Figure 3-8 attempts to illustrate China's hardwood pulpwood supply and demand outlook.

It is fundamentally assumed that fast-growing hardwood plantation programmes would eventuate more or less in parallel with forecast pulpmill developments. The feasibility of this is subject to the government's forest policies and investment legislations, as well as other practical matters such as suitable land availability and social impact on local communities.

Figure 3-8:
Chinese Hardwood Pulpwood Supply and Demand Outlook



3.6 Price Development

Figure 3-9 presents the development of imported softwood log prices from Russia (by species), New Zealand and the US into China, on a USD/m³ cost-and-freight (CNF) basis.

The prices increased considerably between 2003 and 2008, driven primarily by continued significant demand growth in China, coupled with high ocean freight rates. However, the global financial downturn resulted in a sharp price decline during the late 2008 and the early 2009.

The Chinese government has since introduced significant financial stimulus plans, mainly in the domestic infrastructural areas, resulting in quick demand and price recovery, especially in the second half of 2009. The CNF prices for imported logs continued increasing during 2010 as a result. The weighted-average price of imported softwood logs in 2010 was USD133/m³ CNF.

Also illustrated in Figure 3-10 is the development of imported hardwood woodchip CNF prices for major supply countries.

Overall, the recent trend of imported hardwood woodchip prices is found to be comparable to that of softwood log prices; a considerable decrease experienced in 2008/09 and a subsequent recovery during 2009/10. The weighted-average price of imported hardwood woodchips in 2010 was USD85/m³ CNF.

Figure 3-9:
China Imported Softwood Log Price Development

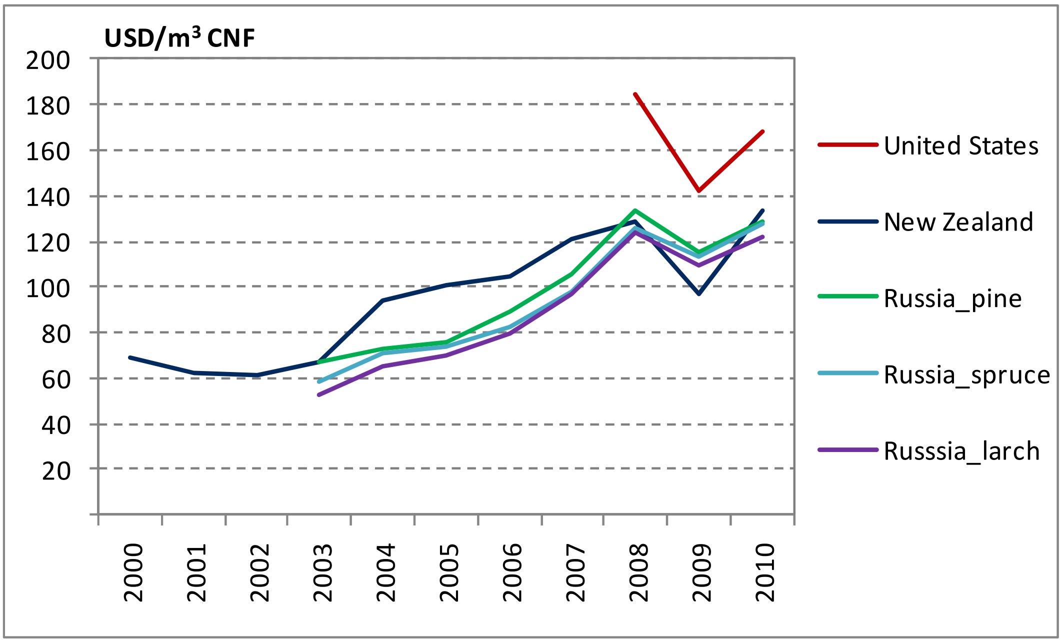
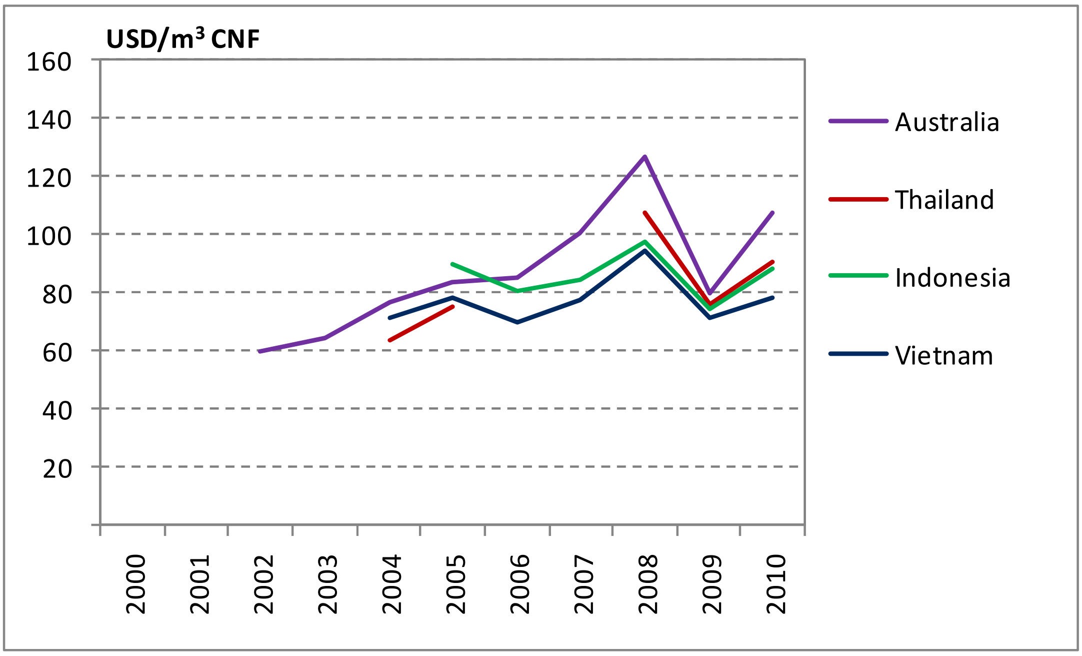


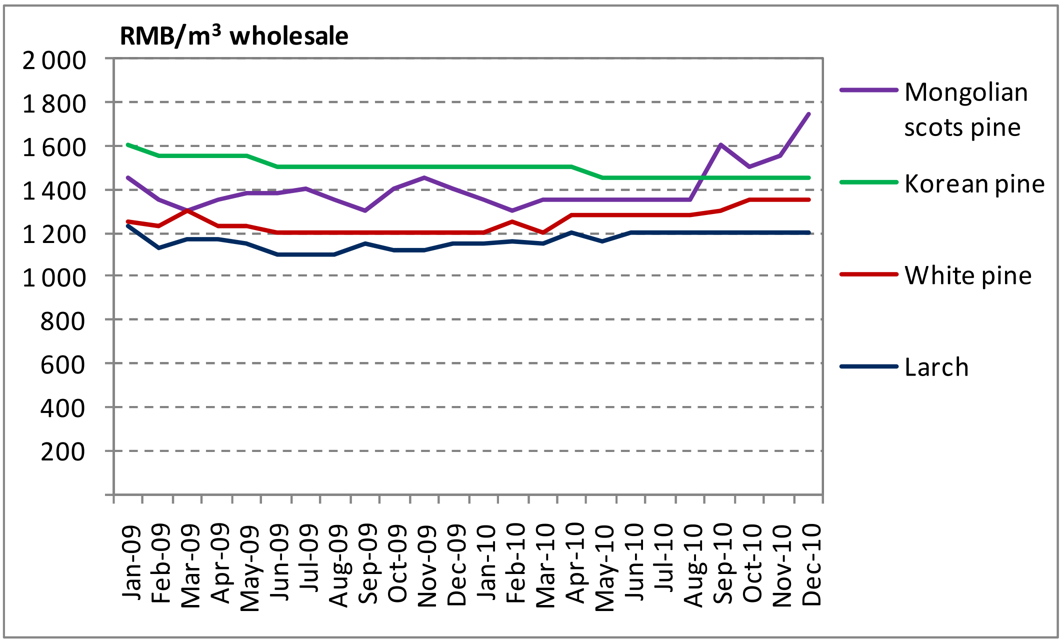
Figure 3-10:
China Imported Hardwood Woodchip Price Development



In addition, Figure 3-11 shows the latest development of domestic softwood log prices at several major wholesale markets. Typically, log prices in China vary greatly depending on region, species and size. Local log sales are conducted either by direct negotiation between seller and buyer, or through large central log wholesale markets.

Domestic log prices are found to be broadly in line with the imported log price trend and are becoming increasingly internationalised. The domestic prices have been comparatively steady over the last two years with an upward trend during the latest months. The domestic prices did not deteriorate as significantly as imported log prices in 2009.

Figure 3-11:
China Domestic Softwood Log Price Recent Trend



3.7 Price Outlook

In forecasting China's domestic log prices, Pöyry analyses a series of factors that affect log demand and supply, production costs and competitive forces.

China's log demand growth stagnated during 2009 affected by the global economic slowdown. The wood products export businesses in particular have suffered. Yearly-average domestic log prices in China dropped by around 5% from 2008 to 2009. However, healthy demand growth resumed during 2010, resulting in upward pressure on log prices. Consequently, domestic log prices on average increased by approximately 2% from 2009 to 2010.

While importing of industrial roundwood logs continues to fulfil domestic fibre demand, China's total log import volume is expected to eventually start declining during the next decade. Although proposed Russian log export tariffs have been postponed indefinitely, supply costs of the Russian imported logs are nonetheless expected to increase as logging locations shift to more distant forests. This will maintain the prices of imported sawlogs at relatively high levels, which will also put upward pressure on domestic sawlog prices.

Regulations on harvest levels amongst the South-east Asian suppliers will suppress the amount of tropical logs available in the next five years. In addition, various measures and regulations that will be implemented to support sustainable forestry in the tropical forest-supplying countries will lead to higher production costs in South-east Asian countries.

Pulpwood demand is expected to increase in the next five years as a number of large mill development plans are implemented, putting upward pressure on pulplog prices. However, generally stagnant global pulp and woodchip prices will offset the opportunity for domestic pulplog prices to increase significantly in the future. Thus, pulpwood price increases are forecast to be less significant than sawlogs.

Presented in Table 3-1 is an overview of the key price-driving factors for the next five years.

Table 3-1:
Price Influencing Factors and Medium-term Prospects

Factors	Medium-term Outlook	Influence on Log Prices	+/-
Domestic Supply	China fibre supply is likely to increase gradually over the next five years. This is a result of the maturing of the domestic forest estate and the likely recognition of this in AAC provisions of the current and future 5-year plans. However, domestic supply will continue to be insufficient to meet domestic demand.	Domestic supply shortage will continue to create some upward pressure on log prices.	+
Domestic Demand	Positive growth in infrastructure, construction and furniture industries will increase fibre demand. China's wood fibre demand from pulpmills stagnated in 2009/10, but will increase in the following years, should large mill development plans eventuate.	Solid lumber/plywood and pulpwood demand will support firming sawlog and pulplog prices.	+
Cost of Production	Transport costs are likely to increase in the medium term as fuel prices in China are expected to rise. However, operational efficiency in logging and transportation can be improved through the introduction of more sophisticated systems.	Increases in the cost of production are likely to cause log prices to rise marginally.	+ -
Imported Woodchip Prices	Strong growth of hardwood chip supplies from Australia, with slowing growth of woodchip demand in south-east Asia as pulpmill expansion projects are delayed.	Potential for downwards movement of delivered prices for hardwood chip as Australia supplies increasing volumes of woodchip into the market.	-
Imported Log Prices	Imported log prices are currently on a rise again after a considerable drop experienced in late 2008/early 2009. Strong demand factors support the short-medium term upward trend. Prices may ease however, if Russia's log export taxes are reduced or eliminated.	Possible upward pressure on domestic log prices in 2011/12, and stabilise.	+ -
	Hardwood log prices are expected to rise in the next five years as tropical hardwood supply is declining. The controls on illegal logging are expected to become stricter during this time.	The price of imported hardwood logs will increase, causing overall log prices in China to rise.	+
Wood-Paying Capability of Wood Processing Industries	Competition in the wood processing industries will limit the wood paying capability of consuming industries.	Due to strong competition in the wood processing industries, the consuming industries' profitability/margins will decline, which will set downward pressure on log prices.	-
	Some technological developments in engineered and reconstituted wood products will allow less volume of wood materials to produce end products.	Technological developments will limit significant real price growth for solid wood lumber products.	-

4 DISCOUNT RATE

A valuation based on a Net Present Value (NPV) approach requires the identification of an appropriate discount rate. In selecting the rates there are two broad approaches:

Deriving the discount rate from first principles. The most common expression of this approach turns first to the Weighted Average Cost of Capital (WACC). This recognises the costs of both debt and equity. The cost of equity may be derived using a Capital Asset Pricing Model (CAPM) method.

A second approach is to derive implied discount rates from transaction evidence.

4.1 Discount Rate derived from WACC/CAPM

As part of the 31 December 2010 valuation of SFC's assets, Pöyry commissioned Associate Professor Alastair Marsden of Auckland UniServices Limited to prepare a report on the cost of capital for a generic forest investment located in China. Dr Marsden’s full report is presented in Appendix 3.

Dr Marsden’s report dated May 2011, applies a WACC/CAPM approach to determine the cost of capital. He has concluded that, depending on the modelling assumptions, a range of discount rates might be proposed for a forest-owning venture in China. His derived ranges of rates are shown in Table 4-1 and Table 4-2.

Table 4-1:
Estimates of Real Post-Corporate tax WACC by Marsden*

Chinese Corporate Tax Rate	"Low" estimate	"High" estimate
Corporate tax rate = 25%	5.8%	8.6%
Corporate tax rate = 15%	5.9%	8.8%

*(denominated in USD for a generic forest asset in China)

The formulation of WACC employed by Dr Marsden was associated with post-tax cash flows and includes the cost of debt. Dr Marsden also converted his estimate of nominal post-tax WACC to an ‘equivalent” real pre-tax WACC through a simple transformation with appropriate qualification as shown in Table 4-2.

Table 4-2:
Estimates of Real Pre-Corporate tax WACC by Marsden*

Chinese Corporate Tax Rate	"Low" estimate	"High" estimate
Corporate tax rate = 25%	7.7%	11.5%
Corporate tax rate = 15%	7.0%	10.3%

*(denominated in USD for a generic forest asset in China)

Dr Marsden’s cost of capital estimates apply as at 03 December 2011.

The standard corporate tax rate in China is 25%. However, this can be reduced to 15% for qualified enterprises that are engaged in industries encouraged by the Chinese Government. Assuming the highest tax rate of 25%, Dr Marsden’s pre-tax corporate WACC has a mid-point of slightly less than 9.1%.

In his report, Dr Marsden mentions other (non-quantitative) factors relevant to the estimation of the cost of capital. In particular, he lists corporate governance, China’s legal, institutional and bankruptcy laws and size of investment and its liquidity as factors that may warrant the application of a cost of capital at the upper end of his range.

Dr Marsden recommends *"(to the extent that such evidence is available) our estimates of the cost of capital for a Chinese forest entity be compared to implied discount rates based on transactional evidence for actual forest sales in the Chinese market."*

4.2 Implied Discount Rates

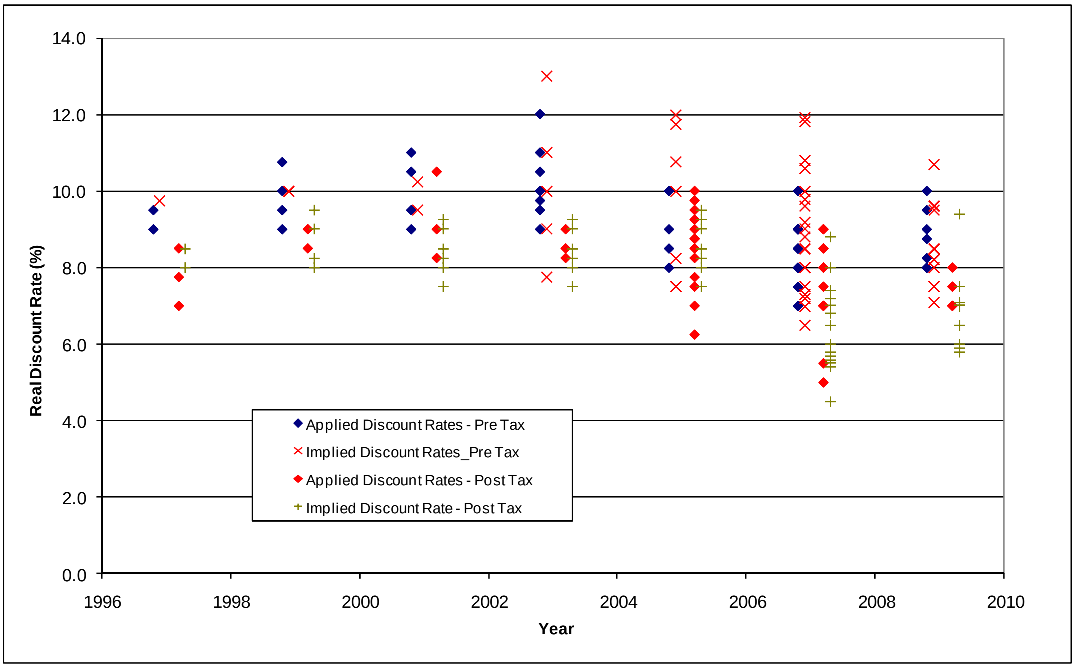
Pöyry has very little implied discount rate data for China and other than sales and purchases that SFC itself has been party to, we are not aware of any major forest transactions in China in the past year. As the commercial plantation forest industry develops and forests are transacted, empirical evidence from which to derive implied discount rates is expected to arise.

By comparison, in New Zealand and Australia analyses of implied discount rates has become a standard means for comparing transaction results and deriving discount rates to apply in forest valuation. In New Zealand, surveys of the discount rates employed by practitioners and their perceptions of the discount rates implied by recent transactions are also published.

The Convenor of the Forest Valuation Working Group of the New Zealand Institute of Forestry, Associate Professor Bruce Manley has published a series of biennial surveys of the discount rates employed by practitioners active in New Zealand and Australia[1]. The trend in the rates canvassed by Dr Manley's surveys is demonstrated in Figure 4-1. As noted in the legend within the figure, it includes not only the valuers' perceptions of IDRs, but also the discount rates that the valuers routinely *apply* in forest valuation. The broad correspondence between the IDR assessments and the applied discount rates is fundamentally sensible. It has become the increasing obligation of forest valuers to produce "market valuations" and a coincidence of the two forms of rate should therefore be expected. In some measure, all of the points are IDRs.

[1] Surveys of discount rates have been reported in the NZ Journal of Forestry in 1997 [NZ Forestry 42(4):47], 1999 [NZ Forestry 44(3):39-40], 2001 [NZ Forestry 46(3):14-15], 2003 [NZ Forestry 48(3):29-31] , 2005 [NZ Forestry 50(3):7-11] 2007 [NZ Forestry 52 (3):21-27] and 2010 [NZ Forestry 54 (4):19-23].

Figure 4-1:
IDRs applied to real Pre-Tax and Post-tax Cash Flows - New Zealand Surveys



A first visual impression from Figure 4-1 suggests a reduction in implied discount rates from 2005 to 2007 followed by a steadying or modest uplift from 2007 to 2009. Closer investigation indicates that there has in fact been an average reduction of 0.3%. As Manley notes, this decrease is largely the result of a relatively large reduction of 0.75% to 1.5% by 4 of the 14 valuers surveyed.

However, compared with New Zealand and Australia, commercial forestry activity and investment in southern China is relatively new and still developing. Forestry business and the valuation of forest crop assets face some challenges, including:

- The reliability of forest descriptions
- The accuracy of yield prediction
- Achieving high growth rates in a consistent manner.
- It is Pöyry's opinion that, for many forest investors, investing in plantation forestry in China would be considered a riskier proposition than investing in the industry in Australia or New Zealand.

4.3 Incorporating Risk in the Discount Rate

If forest investment in China is at present perceived to be a more risky proposition than like activity in other international counterparts, the issue then becomes how to quantify this difference. The textbook treatments of the subject make it clear that the discount rate cannot be regarded as a simple catch-all for any and all forms of perceived risk. As the discount rate may be a very blunt instrument in such a role, it is preferable instead to attempt to acknowledge risk in the development of the expected cash flows to which the discount rate is applied. However, despite this principle, standard practice by many potential purchasers is to load the discount rate where they feel unable to quantify all appropriate risks that should theoretically be reflected into the expected cash flows.

Table 4-3, below is a qualitative comparison of the key forestry risk elements in China and Australasia.

Table 4-3:
Comparison of Key Risk Elements of Forestry in China with Australia / NZ

Risk Item	Comments	Perception of Risk in China Compared to Australia / NZ
Liquidity risk	Likely to be fewer prospective purchasers and more restricted opportunity to exit forest investment in China.	Slightly higher
Valuation risk	Elements of the Forest Description, including recoverable yields (no reconciliation evidence available) and the area statement are less certain. This is balanced somewhat by a positive future market outlook for logs with possibly some conservatism in the Pöyry log price forecast.	Higher
Political and Currency risk	Investment in China is of great interest both internally and to foreign investors. Politics, society and the currency is strong and stable. There is still however some concerns and perceived risks on the part of foreigners especially insofar as land based assets are concerned, where exit could be prolonged, complex and uncertain.	Higher (but may reduce over the next few years)
Stumpage price risk	China's normal demand for wood fibre is strong and is expected to continue to grow. There is a supply deficit of logs. Log prices are high and appear quite strong and stable or increasing in real terms. Logging costs have been increased in this valuation, and brought into line with current actual costs. Accordingly, there is considered to be low stumpage risk.	Lower
Growth and Yield risk	Pöyry is of the opinion that the yield tables underlying the wood flows and cash flows are reasonable. However, until there is a history of reconciliation there will be some uncertainty as to outturn in total recoverable volume and by log grade.	Higher
Land tenure risk	Prospective investors in the forest crop would likely perceive this with some uncertainty, largely due to a lack of understanding of Chinese land tenure and land use rights. Chinese land ownership is complex and is seen as an impediment to investment. As a result the Chinese Government has embarked on a programme to clarify land ownership issues over the next five years. This is likely to result in greater clarity in terms of land tenure and reduce perceived risk.	Slightly higher but likely to reduce over next few years.
Physical or biological risk	The risk of fire and forest losses in the plantation forests of southern China is considered to be lower than in Australasia. Unlike Australia and New Zealand, Southern China experiences its greatest rainfall during the summer months. The relatively small and discontinuous nature of the forests in China mean that in the event of a significant fire occurring, it is less likely that the area damaged would be extremely large. Climatic effect damage such as snow, wind, frost and heavy rainfall are not considered to be very different. China's geographic location renders it more susceptible to entry of pests and disease, although there are no reports of major forest problems or losses.	Similar

The challenge then becomes how to quantify the impact of these differences in risk elements in terms of the discount rate.

4.4 Discount Rate applied in valuing the SFC Resource

The range of rates suggested by the WACC/CAPM approach, at 7.0% to 11.5% is quite broad.

Given the current application of discount rates in the range of 8.5% to 9.5% to pre-tax cash flows in New Zealand, and the comparison of risk elements in Table 4-3, in Pöyry's judgement, an additional 2.0% to 3.0% would seem reasonable to apply to the SFC Planted Forest estate. This is also consistent with Dr Marsden's view that 'other factors' may warrant the application of a discount rate nearer the upper end of his estimates of the real pre-corporate tax WACC.

Pöyry has chosen to apply a discount rate of 11.5% to the pre-tax cash flows forecast to arise from the management and harvest of the current crops of SFC Planted Forest estate. In selecting such a rate we have been inclined to recognise that investors in forestry in China will inherently be taking a long term view, and do have grounds for cautious optimism on the forest industry's future there. The fundamental factors that affect forestry performance are favourable. Importantly too, the definition of market value for the forests requires that there be not just willing buyers, but also willing sellers. If the only purchase offers to be extended involved very high discount rates, we would expect that forests would not be willingly sold.

A discount rate of 11.5% provides a margin of around 7.0% over Treasury Bond 'risk-free' real rates that have prevailed in western economies over the past 20 years.

5 VALUATION METHODOLOGY

5.1 Outline of Valuation Methods

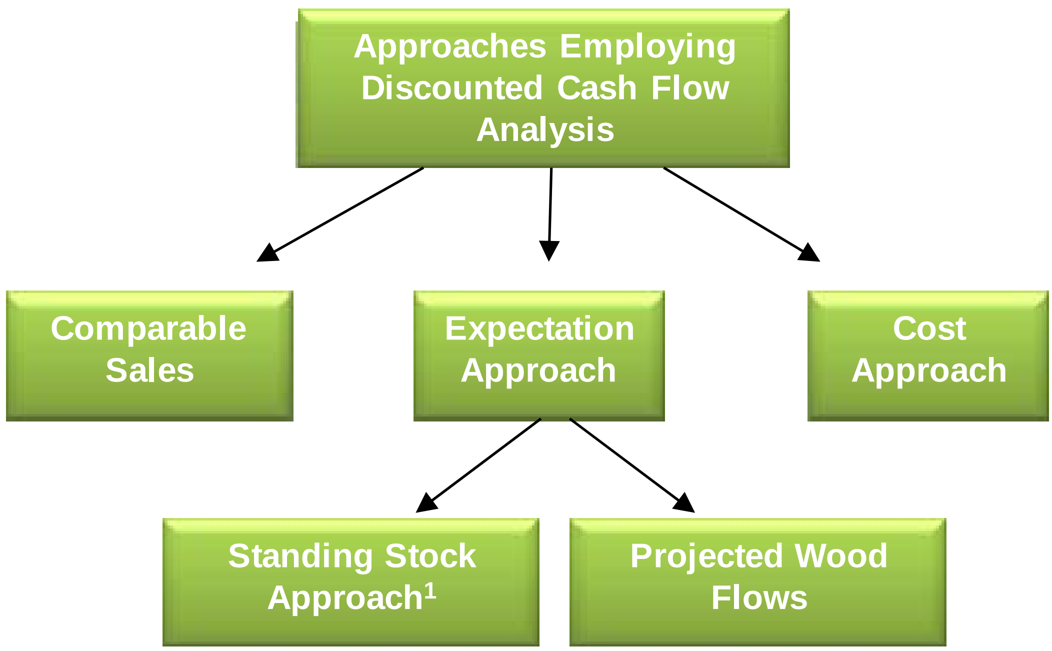
Accompanying the global expansion in planted forests has been ongoing refinement of the processes employed in forest appraisal.

Three main methods of appraisal are commonly distinguished. These are:

1. Comparable sales
2. Expectation value
3. Cost

If these methods are to be effectively utilised in forest valuation then all three of them generally require a discounted cash flow (DCF) approach[2]. A schematic representation of the relationship between the methods is shown in Figure 5-1.

Figure 5-1:
Valuation Approaches



[1] The standing stock approach is the special case where the discounting period used in the DCF analysis is zero.

5.2 Expectation Approach

The Expectation approach invariably involves DCF analysis. It provides the Net Present Value of the future net revenue stream and is commonly referred to as the "Income" or "NPV" approach[3]. As the terminology implies, this approach involves projecting the anticipated future net income stream, and then "discounting" this, at

[2] In this context, DCF is considered within its wider interpretation. This recognises that the timing of the receipt or outlay of funds must be considered. When applied rigorously, the *cost* approach involves compounding. This process is the inverse of discounting, and thereby falls within the scope of DCF.
[3] The list is not exhaustive. Other acronyms that may appear include PNW (Present Net Worth) and PW (Present Worth).

a suitable cost of capital, in order to acknowledge the lower economic value of delayed receipts.

The Expectation approach may characteristically turn to a wide reference base when selecting the discount rate. A commonly applied practice is to derive a Weighted Average Cost of Capital (WACC). This distinguishes the distinct costs of debt and equity. The latter may be derived using the Capital Asset Pricing Model (CAPM).

5.3 Comparable Sales

In principle, the most satisfactory basis for valuing forests is to turn to the evidence provided by sales transactions.

In comparing transaction results it is necessary to consider which attributes influence the value of planted forests. Important factors may include:

- Forest maturity
- Species composition
- Site productivity
- Proximity to market
- Forest terrain (and thereby harvesting system)
- Silvicultural history
- Land value.

Each of these factors may have a significant effect on forest value. Other features may also be influential. These include the standard of roading infrastructure in the forest, and the risks arising from climatic factors and pathogenic agents. Forest size may also have an influence, although there may not be a consistent trend with changing forest area.

When comparing forests and the prices paid for them, it is also necessary to consider the time at which an example sale took place. In the first instance, the timing is reflected in perceptions of current log prices and their anticipated future movement.

Given the range of factors affecting forest value, it is unlikely that forests can be found that are closely similar to the forest to be valued. This is especially the case given that forest estate transactions are not, by nature particularly frequent. Achieving a forest-to-forest match is extremely unlikely, as it would require finding forests alike in all respects, including size.

Forest appraisers commonly find that the one distillable parameter that can be most usefully extracted from transactions involving heterogeneous forest resources is the Implied Discount Rate (IDR). Derivation of the IDR involves developing a credible cash flow projection for each transacted forest, using the best information the analyst can obtain. This is then compared with the price actually paid for each resource. The discount rate at which the discounted cash flows match the purchase price is the IDR.

IDR evidence from the wider transaction base can be applied to the cash flow projections for the forest being valued.

The IDR offers a device by which differences in size, timing, markets, location, age-class, volume, operability and other relevant factors are recognised. Further, the approach also recognises that a useful method of arriving at a market comparable result is to employ the same procedure that market participants utilise in deriving and supporting their negotiating positions. For Asia Pacific forest resources, the most common method of negotiating transaction values involves DCF constructions.

The manner in which Pöyry applies the Comparable Sales and Expectation approaches may at first impression appear to be similar. Both employ a DCF formulation and refer to estimates of future cash flows. This does not imply that they can or should be unquestioningly coalesced into a single method. There is sufficient difference between them that they can potentially lead to different results.

5.3.1 Realisation Value of Current Standing Stock

This method warrants distinct discussion because it has had historical application. It recognises the potential net realisation value of the current timber content of the forest if it were cut down immediately. A value is based on the merchantable content (or “standing stock”) at the time of the valuation. It is therefore a special case within the Expectation approach. Because the forest is harvested immediately, the cash flow modelling is confined to a single period. No discounting is required to recognise the cost of capital. This value is both tangible and comparatively straightforward to calculate. It does however have obvious limitations:

For plantation forests, the timber realisation value of the stand may be very low for most of the rotation length. Despite this, the vendor will be mindful of the funds invested in each stand and are expected to seek some reimbursement.

By the final years of the characteristic rotation, the marginal rate of value growth of the standing stock becomes considerable. An informed and rational owner will recognise the economic opportunity associated with holding the growing trees rather than selling them. Only if the purchaser’s offer matches the vendor’s perception of economic opportunity cost can the vendor be indifferent as to whether to hold or sell. Inherently, therefore, the vendor’s perspective is based not on the current timber content but instead on the future anticipated revenue.

For forest resources of significant size it is unlikely that the market could absorb all of the forest wood content at once without log prices being depressed.

The first effect leads to an unduly conservative valuation, while the third can lead to an overly optimistic result. It is unlikely that the two effects would exactly offset one another. Pöyry’s preference in valuing forests is to avoid this method altogether, as it is unlikely to reflect either the buyer’s or vendor’s analysis.

5.4 Cost Method

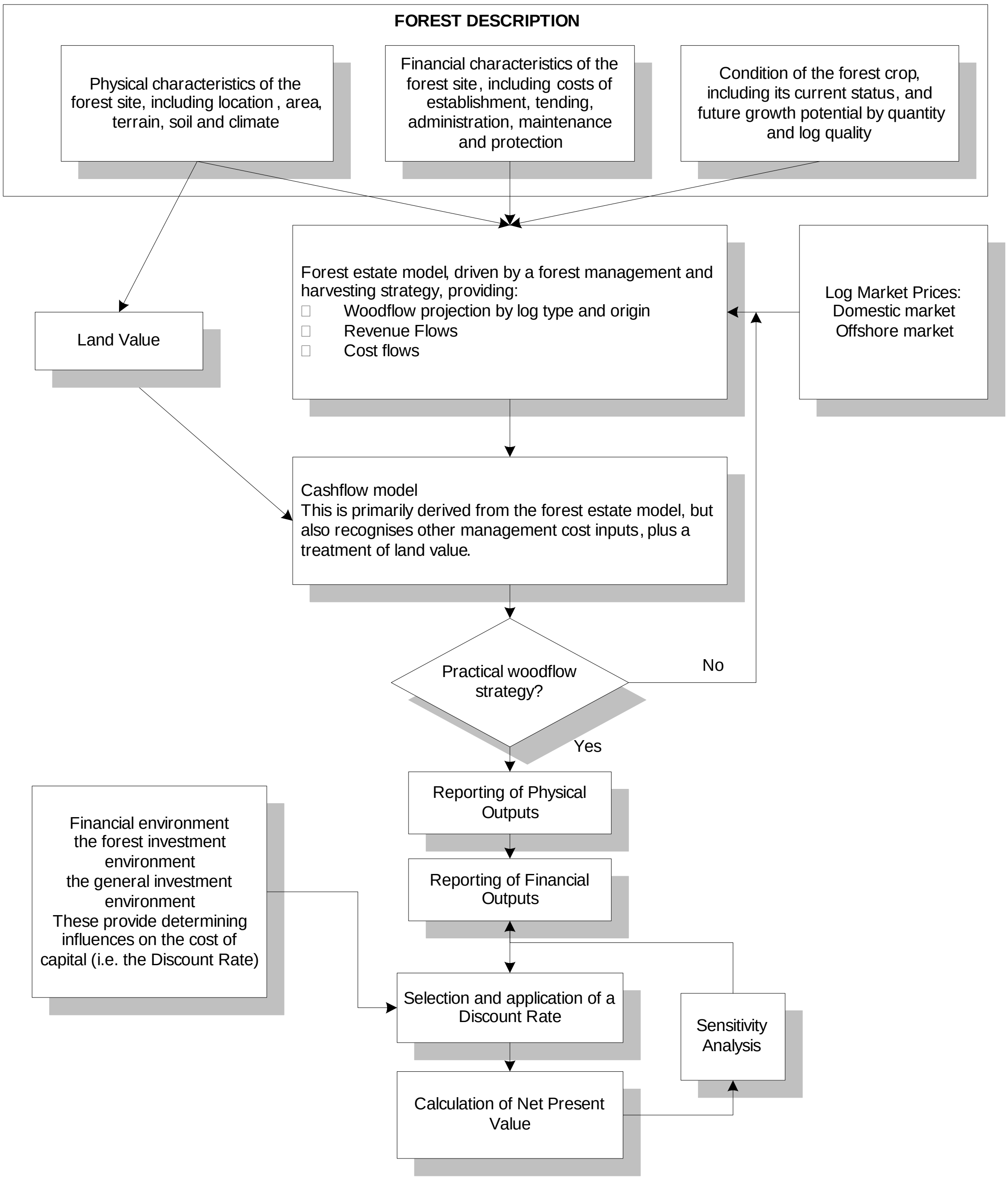
There are different interpretations of the cost approach. A straightforward version takes the costs involved in acquiring or establishing and maintaining the forest and accumulates these with compound interest from the inception of the investment to the current point in time. The forest value is therefore the price that forest owners would have to receive if they were to obtain a satisfactory rate of return on their investment to date. The method is equivalent to the accountants’ concept of "capitalising" establishment/acquisition costs plus interest, although the forest valuer is more inclined to adopt assumed costs which are "standard" and current at the time of the valuation.

By using costs that are current, along with a "real" (inflation-corrected) compounding rate, the valuation is updated for inflation. The use of "industry standard" costs ensures that only costs consistent with efficient practice are recognised. Forest valuers are wary of the compounding approach, and likewise capitalisation. In the market place a "high cost" forest does not necessarily prove to be a "high value" forest and yet this is what the method implies.

5.5 Valuation Process

The process followed in deriving a value for SFC's Planted Forest crop is illustrated in Figure 5-2. The first stage of the valuation process involves assembling a comprehensive "description" of the forest. Key components of this include a land area summary and information on the growth potential of the tree crop.

Figure 5-2:
Schematic Outline of the Valuation Process



At the heart of modern forest management is a forest estate modelling system that employs a linear programming formulation to derive a credible harvesting strategy. This technology enables the collective resource to be modelled to meet various aims, including resource level constraints as well as the supply of various forest products into their end-use markets.

Following confirmation that the results of the forest estate modelling process are managerially workable, the generation of wood flows and the allocation of products to markets enables the derivation of cash flows upon which a DCF valuation can be based. Application of the discount rate to these cash flows produces a present value for the tree crop. The responsiveness of this valuation to changes in the input variables can then be tested with a variety of sensitivity analyses so as to derive a spread of potential tree crop values. This will indicate how sensitive the model is to changes in key inputs.

5.6 Other Aspects of the Valuation Process

In applying the DCF approaches, the following aspects also require consideration:

Analysis of pre-tax or post-tax cash flows

The period of analysis

Terminal value

Harvesting strategy

These aspects are discussed in more detail below.

5.6.1 Analysis of Pre-tax or Post-tax Cash Flows

Both approaches have been demonstrated in valuing planted forests. For cash flows derived on a pre-tax basis a pre-tax discount rate is applied. Post-tax cash flows should be discounted at a post-tax discount rate. If the discount rates have been consistently derived, either approach should lead to the same tree crop value.

5.6.2 The Period of Analysis

Wood flows and associated cash flows may be modelled on a perpetual basis or they may be confined to the current rotation.

Forest estate models have come to be an integral part of the forest valuation process, being applied to identify the forest's long-term supply capability. Despite this extended wood flow-modelling horizon, there has been a general tendency to confine the scope of the financial analysis to those cash flows solely associated with the tree crop that currently exists. This includes all parts of the present forest from the oldest stands to those just established. It excludes, however, trees that are yet to be planted as these are considered to be part of a new investment cycle.

Wider business appraisal practice encourages the confinement of the scope of DCF analysis to the current investment cycle. There are arguments that forest valuation should be no different. The practice of considering the performance of the existing tree crop alone lies with the general preference for avoiding unnecessary conjecture associated with costs, yields, anticipated revenues and the future discount rate.

As generally applied, the current rotation model is not to be confused with a "liquidation" or "realisation" model. Instead, the harvesting strategy for the current tree crop is assumed to be consistent with a long-term sustainable management policy, and although there will be future rotations, they will not contribute to the net present value calculation, i.e. they are "NPV neutral". In effect, all funds invested in them are assumed to earn such proceeds that the investment generates exactly the discount rate.

The current rotation model effectively assumes that through adaptive management the forest owners will seek to secure at least NPV neutrality on their reinvestment in succeeding rotations.

Pöyry finds that the current rotation model is widely applied. Furthermore the IAS41 standard encourages this approach stating:

> *"The objective of a calculation of net present value of expected cash flows is to determine the fair value of a biological asset in its present location and condition" (paragraph 21)*
>
> *"An entity does not include any cash flows for financing the assets, taxation, or re-establishing biological assets after harvest (for example, the cost of replanting trees in a plantation forest after harvest)." (paragraph 22)*

This does not suggest that this places the matter beyond scrutiny. In some locations the approach has found initial application in an environment where log prices have been high. Second and subsequent rotations, which included the expectation of continuing firm log prices, led in many situations to a net addition to the first rotation's NPV. In those circumstances, confining the valuation to the current rotation represented some conservatism.

With log prices having softened, and a greater uncertainty surrounding the prospects of real price growth, current rotation models are now tending to provide higher valuations than their perpetual equivalents, if the discount rate is unchanged. It may be too simplistic to assume that future rotations can indeed be made "NPV-neutral". Certainly, it may be more straightforward with some forests than others to achieve the improvement in performance required. It would seem intuitively reasonable that those forests whose next rotation may be very hard to make profitable should be valued at a lower level than those which require little adaptive management. While Pöyry would prefer to incorporate some recognition of this effect in the valuation method, it is not considered that the market's treatment of it is adequately handled by simply turning to a perpetual model.

Pöyry expects that forest valuers will continue to consider the relative suitability of current-rotation and perpetual models. Refinements to the methodology may necessarily await the availability of more empirical transaction data.

Within the valuation of SFC's Plantation Forest tree crop Pöyry has modelled the resource over multiple rotations in order to reflect the long-term management outlook of the estate. However, the market value estimate is clearly based solely on the cash flows arising from the management and harvest of the existing tree crop and the current rotation of those trees.

6 SFC PLANTATION MAP RECORD CHECK ANALYSIS

6.1 Background

SFC provides data describing the stocked area of forest owned, by species, age and location. Pöyry has neither verified the authenticity of the total area of forest said to be owned, nor its ownership. Pöyry relied on the description of the stocked area of forest SFC has identified it owned, by species, age and location, as at the 31 December 2010.

This analysis has been an ongoing part of the Poyry valuation process. The accuracy of SFC's mapping and stocked area records for their forest areas in southern China was assessed in support of the 2010 valuation exercise. Pöyry selected certain areas for its field inspections and as part of this process conducted an analysis of the stocked area as identified on the maps SFC held as part of the company’s records of the inspected areas. Each of the stands mapped were identified in satellite imagery and a comparison made between the stand boundary shape and the internal stocked area.

The following materials present the results of this analysis. Pöyry does not hold this out to be statistically valid sample such as would be conducted as part of a due diligence assignment. This analysis is used as part of the overall analysis of SFC's area records versus on-ground circumstances to ascertain relative accuracy. **Pöyry highlights again, however, that we have relied on the description of the stocked area of forest that is said to be owned, by species, age and location, as was provided by SFC.**

6.2 Introduction

An assessment of the areal extent of the Sino Forest estate and the accuracy of the mapping was undertaken in support of the 2010 valuation exercise. Sino-Forest provided 10 hand drawn maps containing 67 compartments from various locations in south China. The maps were compared to an assortment of moderate-high resolution satellite imagery.

6.3 Methodology

The primary source of satellite imagery for the analysis was RapidEye. This data source was used because of the availability of cloud-free imagery from November-December 2010 at a 5 m spatial resolution. The imagery is provided as five multispectral bands (blue, green, red, red-edge and near infrared) that are well-suited for detection of forest cover. It is supplied as an orthorectified product with a position accuracy of up to 6 m, suitable for use as a basemap.

A collection of cloud-free Landsat 7 images from late 2009 were also acquired from the U.S. Geological Survey as a secondary data source. The Landsat 7 images have a 30 m resolution and 7 spectral bands useful for vegetation mapping. The imagery has the drawback of containing stripes of missing data as a result of an historical instrument failure event. Where possible, the stripes were filled with other Landsat data of a similar date.

False-colour composites of the RapidEye and Landsat images were prepared to highlight the areas of forest (shown in green) and to distinguish them from non-forest areas (shown in pink or mauve).

The verification process involved five stages:

- Registering the scanned maps (labelled A-J) into a GIS using the coordinates provided.
- Adjusting the locations of the registered scan maps using suitable control points (e.g. river confluences, intersections of roads, valleys and ridge lines) to ensure coincidence with the satellite imagery
- Transferring the hand drawn forest compartment boundaries to the GIS through manual digitizing
- Cross checking compartment boundaries against Google Earth imagery and adjusting boundaries if necessary
- Identifying non-forest areas within compartments from the RapidEye and Landsat imagery and digitizing their boundaries. Google Earth imagery was not used for this purpose as the capture dates of these images are not known.
- Calculating areas of stocked forest using GIS routines and comparing them to areas provided by Sino Forest.

6.4 Results

An example of the comparison of the digitized boundaries of compartment and non-stocked areas with the original scan map and the Landsat, Google Earth and RapidEye imagery for each of the maps are shown in Figures 1-8. These figures illustrate a close correspondence between the mapped boundaries and the forest cover as seen in the imagery.

Table 1 presents the results of the area determinations compared to Sino's stated areas for two example areas, and totals for the entire sample. The consistently larger compartment areas obtained by Poyry indicates a scaling issue with some of the original mapping. This is illustrated by the example Area D below.

Large differences tend to be seen in smaller compartments since changes in area have a proportionately greater impact on these compartments. Compartments with a large negative difference generally result from the exclusion of non-stocked patches within the compartments.

Figure 6-1:
Example Area Comparisons for Maps

Map	Compart-ment	Sino (mu)	Sino (ha)	Pöyry (mu)	Pöyry (ha)	% diff.	Pöyry stocked (mu)	Pöyry stocked (ha)	% diff.
C	4	87.50	5.83	91.20	6.08	4.23	90.15	6.01	3.03
C	9	108.70	7.25	177.45	11.83	63.25	163.95	10.93	50.83
C	10	156.80	10.45	167.25	11.15	6.66	137.10	9.14	-12.56
Totals		***353.00***	***23.53***	***435.90***	***29.06***	***23.48***	***391.20***	***26.08***	***10.82***
D	36	92.20	6.15	93.60	6.24	1.52	75.60	5.04	-18.00
D	37	113.80	7.59	104.10	6.94	-8.52	93.90	6.26	-17.49
D	38	161.50	10.77	165.00	11.00	2.17	154.20	10.28	-4.52
D	39	113.20	7.55	107.55	7.17	-4.99	96.15	6.41	-15.06
D	40	90.60	6.04	89.25	5.95	-1.49	84.60	5.64	-6.62
D	42	160.40	10.69	149.85	9.99	-6.58	143.70	9.58	-10.41
Totals		***731.70***	***48.78***	***709.35***	***47.29***	***-3.05***	***648.15***	***43.21***	***-11.42***
Overall result across all samples		***9918.31***	***661.22***	***11146.35***	***743.09***	***12.38***	***10292.10***	***686.14***	***3.77***

An overall comparison between Sino Forest's compartment records and Pöyry's audit indicates a small difference of +3.77% for the 67 compartment (661.22 hectares versus 686.14 hectares). Thirty six compartments have a difference in area of less than 10% and a further fifteen have a difference of less than 20%. The standard deviation for the percentage difference is 31.11.

Appendix 1

Examples of Analysis

Figure 1 : Map C overlain by digitized boundaries

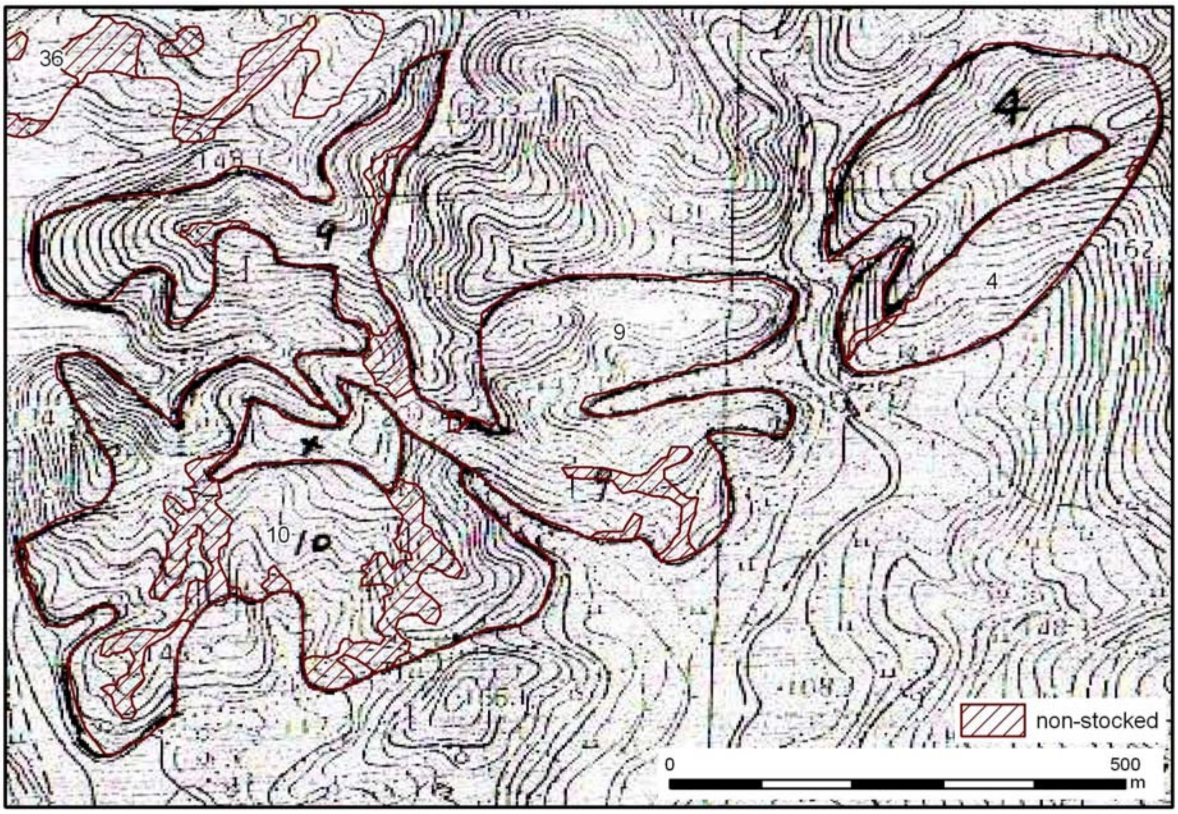


Figure 2 : Landsat 7 imagery (31/12/10) overlain by Map C compartments

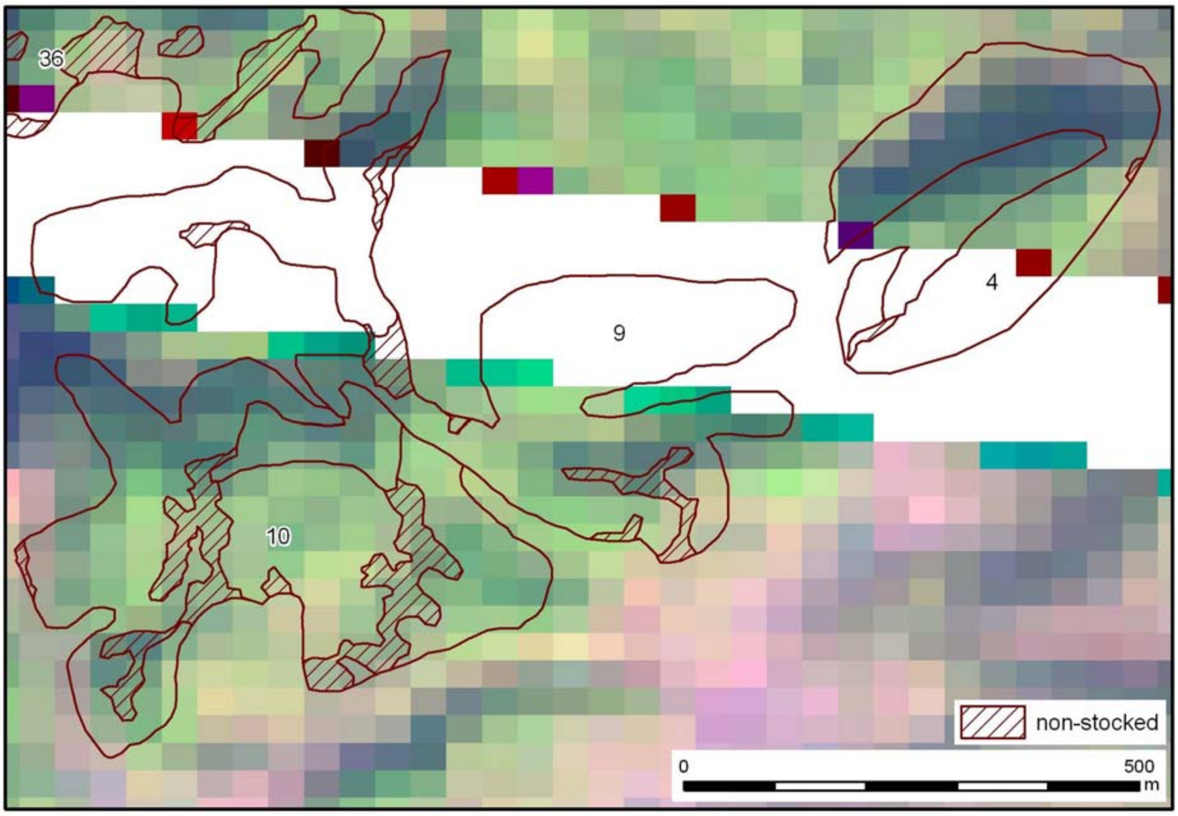


Figure 3 : Google Earth imagery (2009?) overlain by Map C compartments

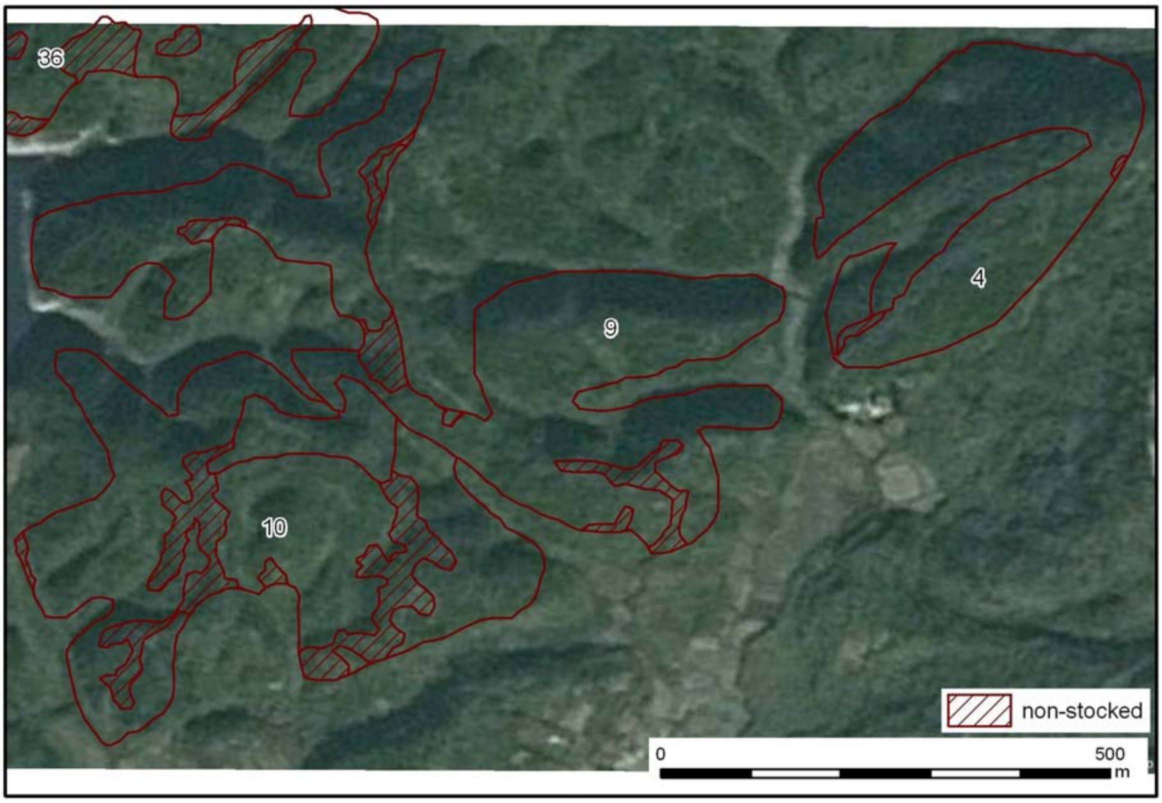


Figure 4 ; RapidEye imagery (2/12/10) overlain by Map C compartments

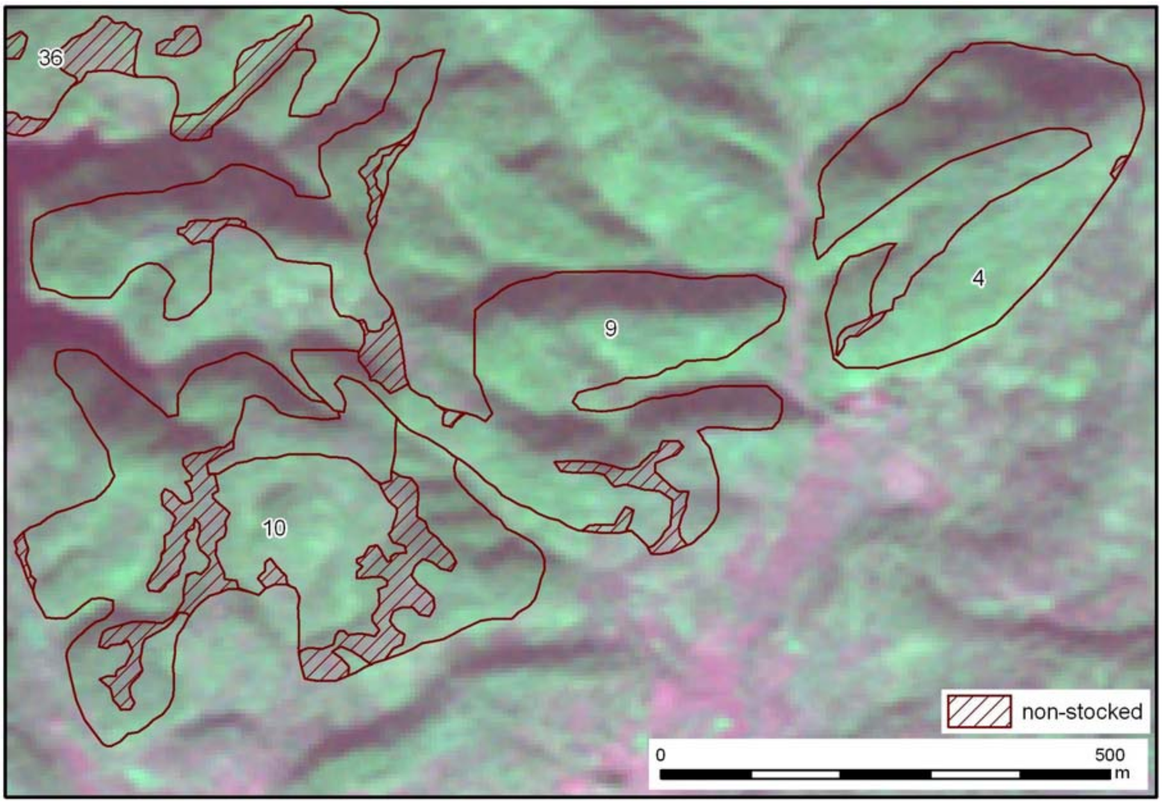


Figure 5 : Map D overlain by digitized boundaries

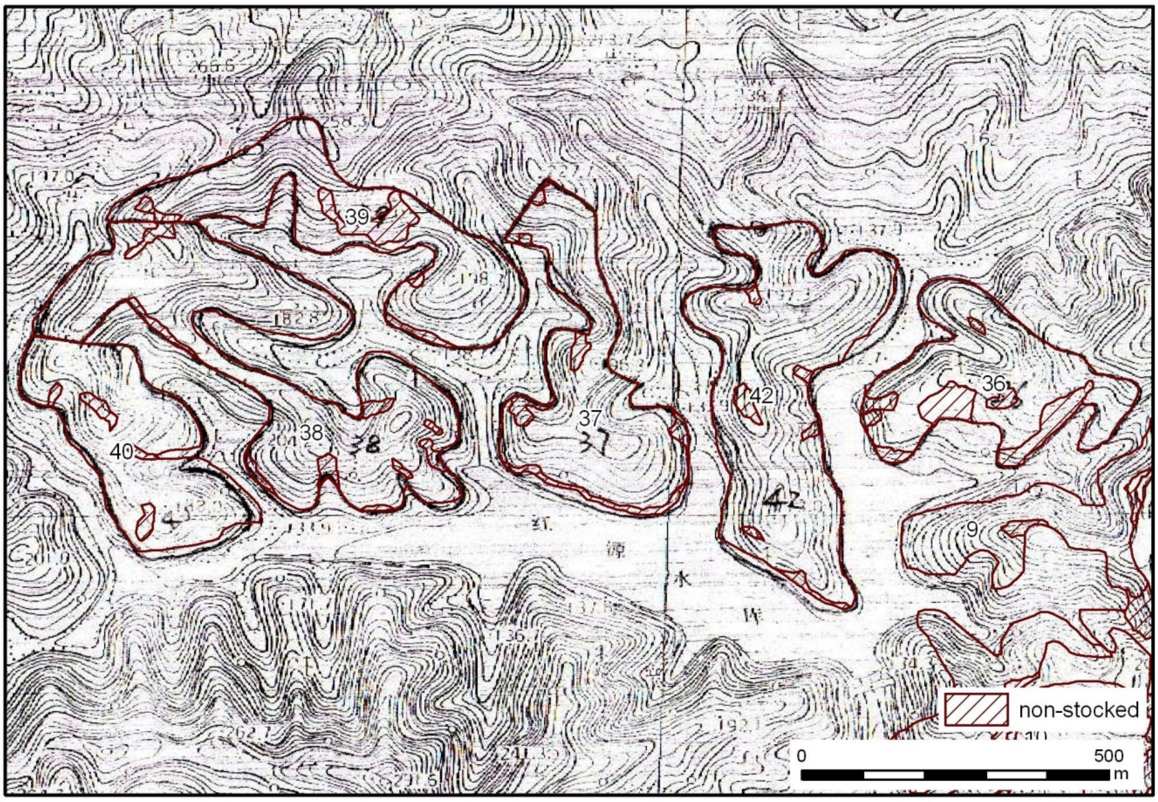


Figure 6 : Landsat 7 imagery (31/12/10) overlain by Map D compartments

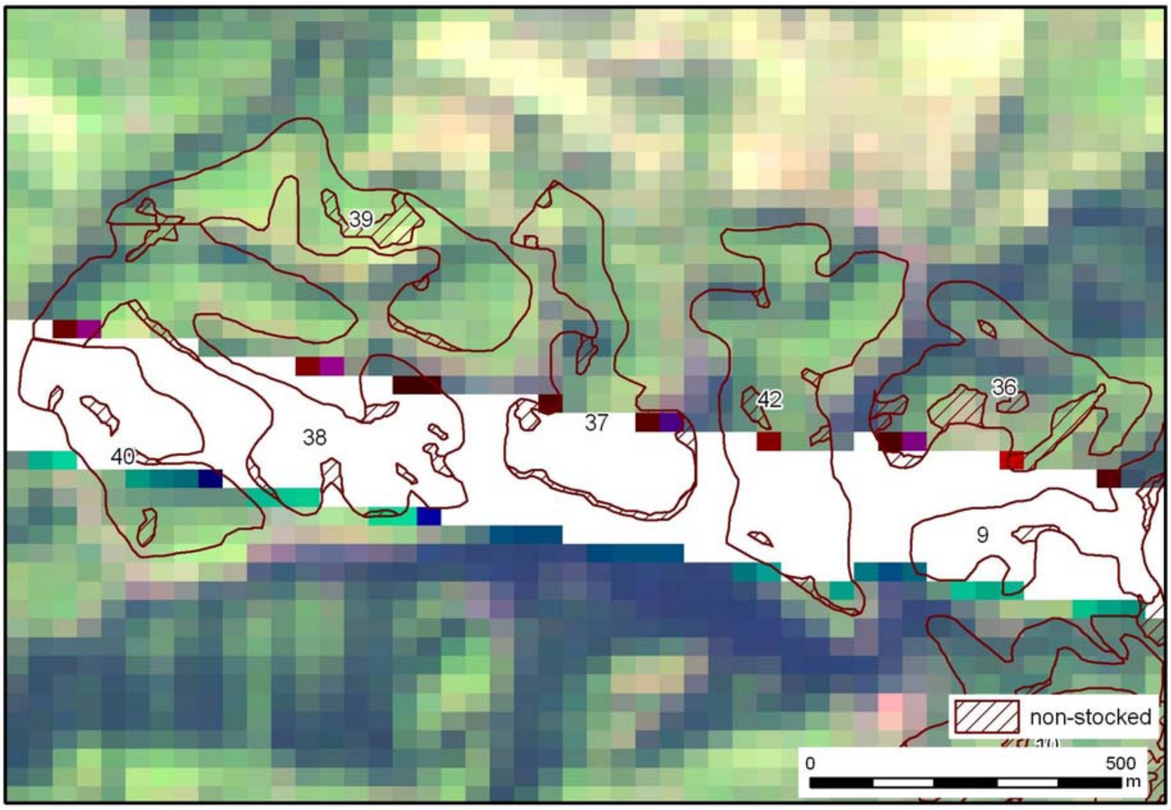


Figure 7 : Google Earth imagery (2009?) overlain by Map D compartments

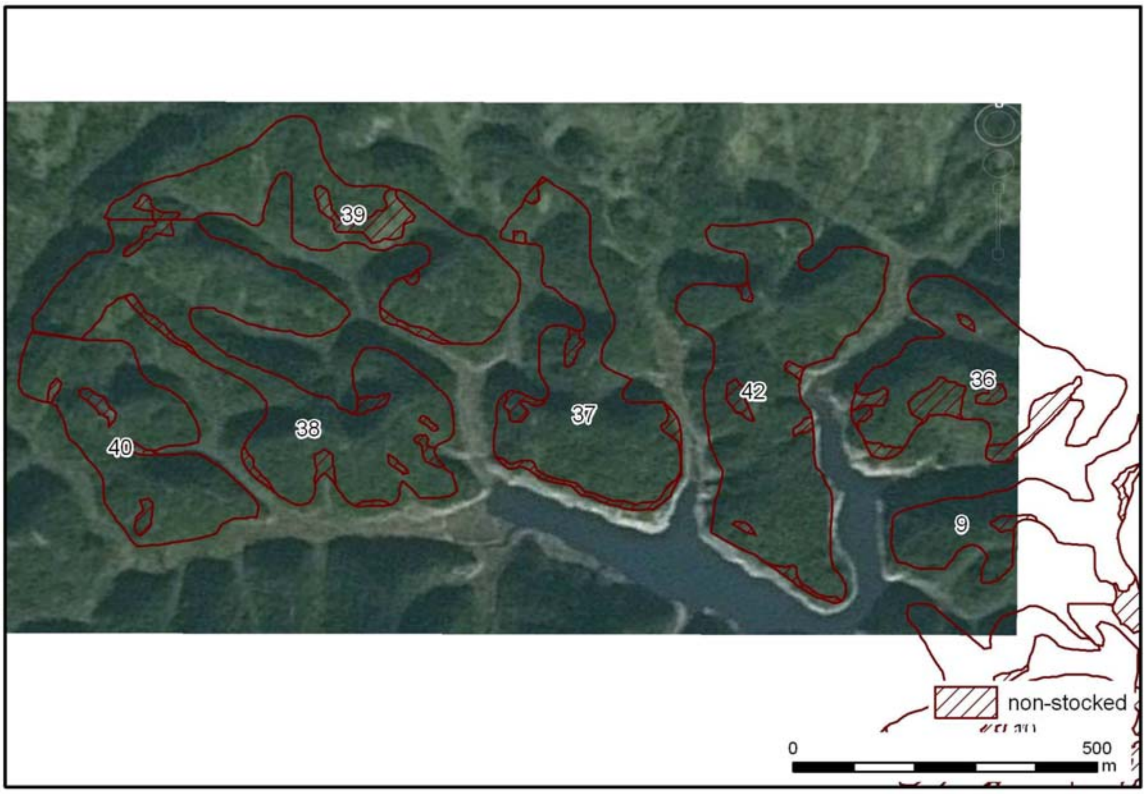


Figure 8 : RapidEye imagery (2/12/10) overlain by Map D compartments