

A STANDARD FOR VALUING COMMERCIAL FORESTS IN AUSTRALIA

VERSION 2.1



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This document is intended to be used for, but not restricted to, forest valuations required under the *Corporations Act 2001*, and forest valuations which require adherence to the AASB's accounting standards.

Version 1 was published in 2004 in response to the Australian Accounting Standards Board adoption of the SGARA approach in AAS 35 and AASB 1037.

Version 2.0 reflected the Australian Accounting Standards Board adoption of the international accounting standards including AASB 141 "*Agriculture*". Version 2.1 contains some minor editorial changes for clarification and reflecting the ongoing changes in the forestry sector. Please note that this standard has been prepared as a working document and has no official standing.

Comments are invited from any who are interested in its application. Comments should be sent to:

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INTRODUCTION

Some years ago, the Association of Consulting Foresters of Australia (ACFA) decided to prepare a handbook to be used by members who were involved in determining estimates of the value of private forest estates, but various delays were encountered. In the meantime, the New Zealand Institute of Forestry prepared *Forest Valuation Standards*, which was used in Australia in lieu of a recognised Australian methodology. This publication had a number of disadvantages being New Zealand based. With the adoption of the Australian Accounting Standards (AAS 35 and AASB 1037) for [Self-Generating and Regenerating Assets \(SGARA\)](#) it became more obvious that there was an urgent need for a more formal methodology and standard for valuing Australian forests.

Agriculture Fisheries and Forestry, Australia (AFFA) was able to assist with funding support, together with Forest Enterprises Australia Ltd, Timbercorp Ltd, and Gunns Ltd. This enabled ACFA to prepare the first version of the standard which was released in May 2004. The Association is greatly indebted to Ian Ferguson, then Professor of Forest Science, University of Melbourne who contributed much to the first draft. His efforts turned this project from a longed-for document into reality.

In mid 2004 the Australian Accounting Standards Board (AASB) decided to adopt international accounting standards as the basis for the Australian accounting standards and issued AASB 141 Agriculture replacing AASB 1037. This standard, based closely on IAS 41 Agriculture, may be found on the website www.aasb.gov.au. Interpretation of this new standard was somewhat challenging and ACFA decided to prepare a supplement to the forest valuation standard that was released in January 2005. This was necessary as the standard was operable for reporting periods on or after that date. The International Accounting Standards Board (IASB) is now the body responsible for preparation of the standard. The role of the AASB is to approve the standard for use in Australia, to suggest changes, and to issue specific paragraphs of relevance to Australia that generally have only a minor impact on forest valuation. They also provide assistance in interpreting the standard. The AASB would appear to have moved away from making any significant changes to the international standard.

In an August 2005 letter to the International Financial Reporting Interpretations Committee (IFRIC) the Chairman of the AASB¹ noted that it is difficult to get responses quickly as IFRIC meets only 7 times a year, that IFRIC has refused to issue binding interpretations on some issues, and that IFRIC could not endorse particular domestic interpretations by particular countries. In essence he postulated that Australia might have to make its own interpretations. Obviously this could impact Australia's international credibility and could negate the advantages expected from the adoption of international standards. The challenges currently faced in forest valuation are part of a much wider concern about the Australian adoption of the international standards.

In July 2005, the Productivity Commission produced a research paper² that included a comparison of five forestry based Government Trading Enterprises. The bases of the forest valuations were inconsistent, even though each organisation (and their auditors) believed that they met the accounting standards. Such inconsistency is detrimental to sound comparative analysis and to the standing of financial reporting of forestry investments.

At that time a more complete interpretation of the standard became imperative. ACFA recognised that both the AASB and ACFA have no option but to work within this international framework of standards. ACFA believed that a sensible interpretation of the international standards was necessary and was also possible, and recognised that such a standard would always be subject to reinterpretation, evolution and change.

¹ See The Age Newspaper 15 August 2005 article by Leon Gettler.

² Productivity Commission, 2005, *Financial Performance of Government Trading Enterprises 1999-00 to 2003-04*. Productivity Commission, Melbourne.

ACFA approached the Forest and Wood Products Research and Development Corporation (FWPRDC) for funding to assist in preparing this second version of the ACFA forest valuation standard and also to assist in the preparation of a handbook to accompany the standard. ACFA are pleased to acknowledge the considerable support received from FWPRDC now Forest and Wood Products Australia (FWPA) through PN06.1031.

This latest update incorporates administrative changes as the Association of Consulting Foresters of Australia is now a Division of the Institute of Foresters of Australia. It also incorporates some minor explanatory changes as a result of discussions with members of the Australian Valuation and Property Standards Board (a board under the Australian Property Institute) and the International Valuation Standards Council and Board.

This ACFA standard is not a recipe for all situations but aims to provide sufficient guidance for forest valuers who can either accept its approaches or can argue a case for alternatives. ACFA stresses the fundamental need to **document, disclose and detail** the approaches that are adopted in any forest valuation, especially if they depart from this standard or any AASB standard.

In the text, some passages that should be considered mandatory for ACFA members are presented in bold type. Not all forest valuations have to meet the AASB accounting standards and every attempt has been made to clearly show when the AASB accounting standards are appropriate. In parallel with the second version of the standard a Handbook was prepared. This enabled an amount of descriptive material present in the first version to be moved to the handbook. Both this updated second version of the forest valuation standard and the handbook are available from the website noted in the footnote.

The Association is committed to upholding high ethical principles in forestry consulting, and sees this second version of the *Australian Standard for Valuing Commercial Forests* as a major contribution to that commitment. The Association also accepts that it will be responsible for continuing to up-date the standard as procedures change and as experience is gained in applying it.

DEFINITIONS, REFERENCES, CODES AND STANDARDS

Throughout this Standard, definitions of key terms are generally provided through hyperlinks to a list of definitions, explanations, or guidelines, except where exhibition in the text is critical to understanding. Normally, the hyperlinked definition is only provided at the time the term is first used.

Hyperlinks to publicly accessible websites are also used for reference to the various codes and materials that are relevant to valuation. The matters covered in these publications are not repeated in this document, because they may be changed or updated from time to time.

Footnotes are used to provide references to published literature not available on the web. In general, these references have been confined to current publications readily accessible in Australia. There is, of course, a much wider array of information available in journals such as *Australian Forestry*, *Australian Forest Grower*, *Tasforests*, *New Zealand Journal of Forestry* and *New Zealand Journal of Forestry Science*, in publications and unpublished research theses in research organizations and universities, and on the websites of the various State agencies and companies with responsibility for commercial forest management.

Reference to relevant Codes, such as the various State Codes of Forest Practice, are made through hyperlinks to publicly accessible websites, where available, or through footnotes to published material. Not all such codes are referenced and forest valuers will need to address the codes for the relevant states and territories.

Paragraphs shown in bold type, as shown here, should be regarded as a mandatory requirement for members of the Association of Consulting Foresters of Australia and are highly recommended for all members of the Institute of Foresters of Australia.

This use of bold type does not necessarily indicate mandatory requirements under AASB accounting standards. Any extracts from AASB accounting standards are shown in italics with the standard and paragraph in square brackets, generally after the quotation. Other quotations are not in italics.

CHANGES TO ACCOUNTING STANDARDS

Like the first version, this revised second version of the ACFA forest valuation standard is primarily directed to describing methods that meet the requirements of the AASB accounting standards. The relevant accounting standards are discussed in section 2 of this standard.

The AASB is implementing the Financial Reporting Council's policy of adopting the Standards of the International Accounting Standards Board (IASB) for application to reporting periods on or after 1 January 2005. The AASB has, however, decided to continue to issue sector-neutral Standards, appropriate for both for-profit and not-for-profit entities, including public sector entities. As a result of the above decisions, the AASB issued AASB 141 *Agriculture* in July 2004. AASB 141 replaces AASB 1037 *Self-Generating and Regenerating Assets* and AAS 35 *Self-Generating and Regenerating Assets*. AASB 1037 and AAS 35 were both issued in August 1998, and were applicable to financial years ending on or after 30 June 2000. AASB 141 is equivalent to IAS 41 *Agriculture* as issued by the IASB. The latest version is dated October 2009.

AASB 141 is mandatory for formal general purpose financial reporting as required under the Corporations Act 2001 for financial years commencing on or after 1 January 2005.

The term 'biological assets' supersedes what in AASB 1037 and AAS 35 were called 'self-generating and regenerating assets' (SGARAs). AASB 1037 and AAS 35 defined SGARAs as non-human living assets. AASB 141 defines a biological asset as a living animal or plant. Trees were previously classified as SGARAs and are now classified as biological assets. The term [Living Trees](#) defined in the first version of the ACFA standard has been retained here because it meets the AASB 141 definition and provides a more specific forestry term for the biological asset concerned. It avoids the use of conventional forestry terminology, which does not precisely meet the SGARA definition, nor the AASB 141 standard.

AASB 141 uses the term fair value which can be considered equivalent to the previously used term net market value. It is a critical term. This is almost identical to the definition of Net Market Value used in the previous ACFA standard for forest valuation.

One significant difference between AASB 141 and the superseded AASB 1037 and AAS 35 is that AASB 141 outlines a hierarchy of choice in the valuation method used to determine the fair value of biological assets, whereas AASB 1037 and AAS 35 did not outline a similar hierarchy. AASB 1037: 5.3 merely stated "*Where there is no active and liquid market for a SGARA, the best indicator of the net amount which could be received from the disposal of the SGARA in an active and liquid market must be used to measure the SGARA, taking into account all relevant information*". The hierarchy outlined in AASB 141 is discussed in this standard.

AASB 1 requires information for the prior period (presented as comparative information) to be restated as if the requirements of this standard had always been applied. The requirements of AASB 1 *First-time Adoption of Australian Equivalents to International Financial Reporting Standards* must be observed. This differs from previous requirements where changes in accounting policies did not require such a restatement, although many entities did so as a matter of good financial practice.

OTHER VALUATION STANDARDS

The International Valuation Standards also provide an alternative set of standards that may need to be considered. The trend is for more emphasis on principles and less on direction and so the changes required to this standard to take the current IVS standards into account

are not major. The implications of this will evolve in the future as a proposed Working Party considers forest valuation.

ACKNOWLEDGEMENTS

Over the past few years many people have contributed to this project. We owe thanks to numerous people in Government agencies, forestry companies, consultancy and other organisations that have contributed to understanding the problems and who have provided critical comment.

The Association wishes to thank staff of the Australian Accounting Standards Board, especially Angus Thomson, Robert Keys, Mark Shying, Monique Ledden, Aletta Boshoff and Joanna Spencer, for their helpful suggestions and critical comments. The Association also wishes to thank members of the Australian Property and Valuation Standards Board, especially Mr Bob Connolly and Mr William Reynolds for their helpful comments.

The New Zealand Institute of Forestry kindly allowed us to continue to draw on their valuation standard and they, through the Convenor of the Forest Valuation Working Party Professor Bruce Manley, have provided much-valued comments.

FWPRDC (now FWPA) provided encouragement, funds and critical comment that enabled ACFA to prepare this second version. Financial support was also received from:

- Forest Products Commission Western Australia
- Department of Primary Industry Forestry Queensland, now Forestry Plantations Queensland
- Hancock Victorian Plantations Pty Ltd
- Forest Enterprises Australia Ltd
- Integrated Tree Cropping Ltd
- Timbercorp Ltd
- Auspine Ltd
- Jaako Pöyry Management Consulting (Asia-Pacific) Pty Ltd
- Chandler Fraser Keating Ltd
- Green Triangle Regional Plantation Committee Inc
- Gippsland Private Forestry Inc
- Central Victorian Plantation Committee and
- Plantations North East Inc.

In return, these organisations were provided with the first draft of V2.0 of this document for comment and review. Many other public and private forestry organizations have supported the project in principle.

The Technical Editor for Version 1 of this Standard was Emeritus Professor Ian Ferguson of the University of Melbourne. The Technical Editors for Version 2 were Dr Jerry Leech and Emeritus Professor Ian Ferguson.

ACFA also wishes to thank Dr Chris Borough, Maree Candish, Mike Colley, Gerry Cross, Tony Fearnside, Phil Lloyd and Gerard Moore for their input to this project.

1. PURPOSES OF FOREST VALUATION

1.1 VALUE OF FORESTS

Forests provide many potential sources of value for a wide array of beneficiaries that range from a small landowner selling a parcel of standing trees for current or later use in wood production, to the global population deriving probable benefits or costs in relation to global warming through carbon sequestration or carbon release by forests.

1.2 SCOPE OF THIS STANDARD

This standard deals **only** with the valuation of commercial goods or services by entities that have private (that is legally assigned) property rights over those forests or living trees likely to provide commercial goods or services. It is designed to assist those who need to value their forest estate for the purposes of financial reporting, financial transactions or financial management. It does **not** deal with the valuation of forest estates that supply **unpriced or non-market goods and services**.

1.3 PURPOSES OF THIS STANDARD

The purposes of this standard include valuation for the following:

- **Formal financial reporting as required by the *Corporations Act 2001***

If the purpose of the valuation is for formal financial reporting as required by the Corporations Act 2001, compliance with the AASB accounting standards is mandatory. The AASB accounting standards relevant to forest valuation for financial reporting purposes are discussed in section 2 of this standard.

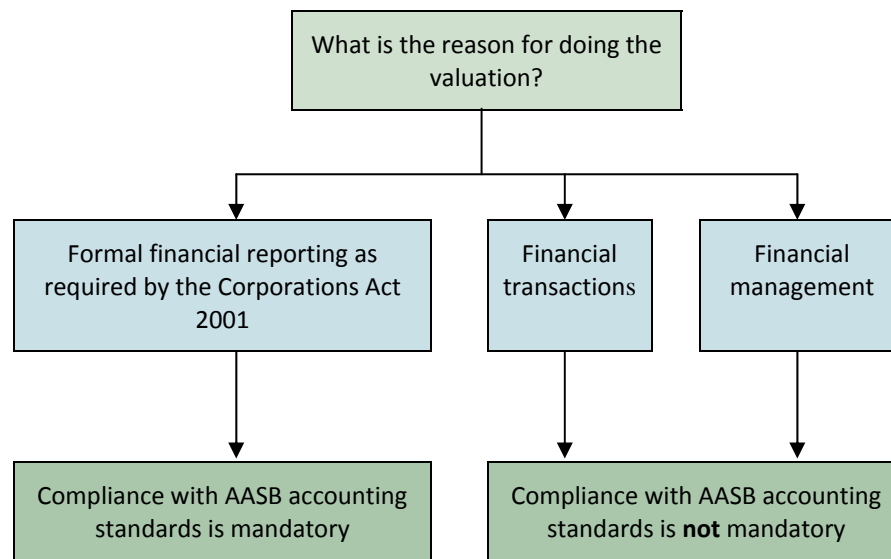
Additional formal requirements are specified elsewhere for offer documents, especially those for Afforestation Managed Investment Schemes, and Afforestation Investment.

- **Financial transactions**

Financial transactions involving forests and plantations involve many different perspectives such as a buyer, a seller, an investor, an insurer, an inheritor or a taxpayer. For these valuations the strict use of AASB 141 may be misleading and inappropriate as that standard refers to the biological asset component of the forest only.

- **Financial management**

Good stewardship requires that owners and managers periodically revalue and assess the past and prospective financial performance of the enterprise. Again, the AASB standards, especially AASB141, may be quite inappropriate for these analyses because it refers to only one component of the forest.



1.4 AGREED TERMS OF REFERENCE

Any professional valuation requires an agreed set of terms of reference, whether written or verbal, to which the consultant should formally respond in accepting the task, and in reporting.

1.5 INDEPENDENT VALUATIONS UNDER CORPORATIONS ACT 2001

The distinction between an [independent valuation](#) and a less-formal valuation needs to be stressed. The Australian Securities and Investments Commission (ASIC) has strict guidelines relating to independent valuations when intended for publication to a section of the public and issued for a purpose regulated by the Corporations Act 2001. The following represent a summary of key points regarding independent valuations.

In the case of independent valuations, the commissioning party should provide the expert with written instructions that clearly set out the scope and purpose of the report and ensure the independence of the expert in writing the report and in drawing conclusions. It is therefore inappropriate for the independent expert to be involved in discussions about, or in the drafting of, the proposal.

Independent experts are expected to provide readers of the report with an objective and unbiased assessment, independent of an interested party. Failure to disclose interests may constitute misleading or deceptive conduct under s995 of the Corporations Act 2001. Note that the onus of the proof of reasonableness of forecasts used in valuations is on the person making the forecast. This is a reversal of the usual onus of proof.

In the report, experts should disclose the material that they have relied on and assumptions used in their assessment. They should also disclose, to the extent necessary to assist readers to assess the value of the report:

- the origin of the material used in it,
- the inquiries made,
- the time constraints under which the work was done, and
- whether access was refused to information on which a fuller appraisal might have been based, and any potential impact of such refusal.

The expert's statutory liability cannot be absolved by any disclaimer in the report. If unable to give a definite answer, the expert should either decline to provide a report, or explain the nature and causes of the uncertainties involved.



The Association of Consulting Foresters of Australia:

- expects members to adhere to the above points in situations in which the Australian Securities and Investments Commission guidelines apply,
- encourages their use in other valuations, where appropriate, and,
- recognises that not all valuations are independent and that the above points may not be fully appropriate for these less-formal valuations.

1.6 MANAGED INVESTMENT SCHEMES AND INVESTOR'S GUIDE TO INVESTMENT

Adherence to the *Disclosure Code of Practice for Afforestation Managed Investment Schemes* and to the *Investor's Short and Annotated Guides to Afforestation Managed Investment Schemes* (Australian Forest Growers www.afg.asn.au) is mandatory for members of the Association of Consulting Foresters of Australia and is recommended for members of the Institute of Foresters of Australia, when engaged in valuations.

These documents specify reports by independent foresters and normally also involve some form of valuation.

1.7 OTHER VALUATIONS

Less formal valuations, or appraisals, that do not come under the *Corporations Act 2001* do not necessarily have to meet the above requirements. Not all valuations are independent and some landowners may not be equipped or prepared to provide written instructions. Care should be taken not to compromise the valuation by the expected use.

The possibility of litigation over the outcome of a valuation or appraisal suggests that the requirements embodied in an independent valuation need to be considered carefully in undertaking less-formal valuations or appraisals and in writing a report.

Disclosure is clearly a very critical element.

1.8 DISCLOSURE

While AASB standards (AASB 101:116-123) require disclosure of key sources of estimation uncertainty, these principally relate to the nature of the assumptions and their effect on the current (but not any future) carrying amount of assets and liabilities concerned. It is not necessary to disclose budget information or forecasts in making these disclosures. Disclosure of certain key assumptions is also required under various specific standards, including AASB 141. These are summarised in the relevant sections that follow.

2. ACCOUNTING STANDARDS

2.1 RELEVANT ACCOUNTING STANDARDS

If the purpose of the valuation is for formal financial reporting as required by *Corporations Act 2001*, compliance with the AASB accounting standards is mandatory.

The following accounting standards, available on the AASB website (www.aasb.gov.au), might be relevant to forest valuation for financial reporting purposes:

Accounting standard	Item
AASB 102 Inventories	Agricultural produce after harvest.
AASB 116 Property, Plant and Equipment	Land and buildings related to agricultural activity Plant and equipment related to agricultural activity
AASB 117 Leases	Biological assets Land and buildings related to agricultural activity
AASB 138 Intangible Assets	Intangible assets related to agricultural activity
AASB 140 Investment Property	Land and buildings related to agricultural activity
AASB 141 Agriculture	Biological assets Agricultural produce at the point of harvest

The identification of the relevant accounting standard is fundamental, because any or all of the items covered by the above mentioned accounting standards may form part of the value of a forest entity and each accounting standard has specific recognition and measurement requirements.

The need to identify the relevant accounting standard is highlighted by the significant different accounting treatment of the changes in the fair values of the relevant items. The accounting treatment of the changes in the fair values of the above mentioned items can be summarised as follows:

Influence profit and loss	Directly to equity
Biological assets	Property, plant and equipment
Agricultural produce	Intangible assets
Investment property	
Inventories	

The measurement requirements outlined in the various applicable accounting standards are particularly important for a valuer and are addressed in the remainder of this section.

2.2 SEPARATION OF ASSET TYPES

If the forest valuation is required to meet the requirements of the *Corporations Act 2001*, then the valuation will be required to separate the biological asset component from the

other asset components (i.e. property, plant and equipment, investment property, intangible and non-current assets including the value of subsequent crops, inventory, etc.) and to value each individual asset component separately.

AASB 141:25 very clearly states that even if the fair value of the biological asset can only be determined as a residual amount (fair value of the combined asset less the fair value of the land), the fair value of the biological asset has to be determined and disclosed separately.

ACFA recognises that this separation requirement may be problematic. ACFA also notes the use of the word “may”, so this deduction approach is not mandatory.

2.3 BIOLOGICAL ASSETS

AASB 141 applies to biological assets when they relate to agricultural activity.

A biological asset is a living animal or plant (AASB 141:5). Trees (Living Trees) in a plantation forest are an example of a biological asset (AASB 141:4).

Agricultural activity is the management by an entity of the biological transformation of biological assets up to the point of sale, into agricultural produce, or into additional biological assets (AASB 141:5). Biological transformation comprises the process of growth, degeneration, production, and procreation that cause qualitative or quantitative changes in a biological asset (AASB 141:5). Agricultural activity covers a diverse range of activities, including forestry and cultivating plantations.

The following common features of agricultural activity apply to trees:

- Capability to change. Plants (trees) are capable of biological transformation (i.e. growth).
- Management of change. Management facilitates biological transformation by enhancing conditions necessary for the process to take place (for example, monitoring and managing nutrient levels, thinning).
- Management of change. The change in quality (for example, by pruning, thinning and fertilisation) or quantity (for example, volume and size distribution) brought about by biological transformation is measured, monitored and predicted as a routine management function.

Biological transformation results in the following types of outcomes.

- Asset changes through;
 - growth (an increase in quantity or improvement in the quality of the tree),
 - degeneration (a decrease in the quantity or deterioration in quality of the tree, for example mortality, insect or pathogenic attack), or,
 - procreation (creation of additional living trees, especially in a native forest or natural regeneration context).
- Production of agricultural produce such as saw and veneer logs, pulp wood, chip or material for preservation.

2.4 AGRICULTURAL PRODUCE AT THE POINT OF HARVEST

AASB 141 applies to agricultural produce at the point of harvest when they relate to agricultural activity. The point of harvest of the biological asset (Living Trees) will commonly be at stump.

Agricultural produce is the harvested product of the entity’s biological assets.

Harvest is the detachment of produce from a biological asset or the cessation of a biological asset’s life processes.

2.5 MEASUREMENT OF BIOLOGICAL ASSETS AND AGRICULTURAL PRODUCE

There is a presumption that fair value can be measured reliably for a biological asset. However, that presumption can be rebutted only on initial recognition for a biological asset for which market determined prices or values are not available and for which alternative estimates of fair value are determined to be clearly unreliable. In such a case, that biological asset shall be measured at its cost less any accumulated depreciation and any accumulated impairment losses. Once the fair value of such a biological asset becomes reliably measurable, an entity shall measure it at its fair value, less costs to sell. Once a non current biological asset meets the criteria to be classified as held for sale (or is included in a disposal group that is classified as held for sale) in accordance with AASB 5 Non-current Assets Held for Sale and Discontinued Operations, it is presumed that fair value can be measured reliably. [AASB 141:30]

The above presumption can be rebutted only on initial recognition. An entity that has previously measured a biological asset at its fair value less estimated point-of-sale costs continues to measure the biological asset at its fair value less estimated point-of-sale costs until disposal.

In all cases, an entity measures agricultural produce at the point of harvest at its fair value less costs to sell. This Standard reflects the view that the fair value of agricultural produce at the point of harvest can always be measured reliably. [AASB 141:32]

Later sections describe how fair value can be measured for the biological asset.

For agricultural produce the fair value is considered to be at the stump although the price negotiated may be at stump or at mill door. In the latter case it is necessary to exclude transport and other costs necessary to get the produce to the market (AASB 141:14). In either case it may be necessary to deduct commissions to brokers or dealers and to deduct levies, taxes and duties (AASB 141:14).

2.6 PROPERTY, PLANT AND EQUIPMENT

Land and buildings related to agricultural activity are accounted for as property, plant and equipment as prescribed by AASB 116 or investment property as prescribed by AASB 140.

Property, plant and equipment are tangible items that;

- are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes, and
- are expected to be used during more than one period.

An entity can choose either the cost model (cost less accumulated depreciation, less accumulated impairment losses) or the revaluation model (fair value less subsequent accumulated depreciation and subsequent accumulated impairment losses) as its accounting policy in respect of property, plant and equipment.

2.7 INVESTMENT PROPERTY

Land related to agricultural activity are accounted for as property, plant and equipment as prescribed by AASB 116 or investment property as prescribed by AASB 140.

Investment property (land or a building, or part of a building, or both) held (by the owner or by the lessee under a finance lease) to earn rentals or for capital appreciation or both, rather than for;

- use in the production or supply of goods or services or for administrative purposes, or,
- sale in the ordinary course of business.

An investment property is initially measured at cost. An entity can choose either the cost model or the fair value model as its accounting policy in respect of the subsequent measurement of investment property.

In the cost model the property is valued at cost less accumulated depreciation, less accumulated impairment losses. In the revaluation model it is valued at fair value less subsequent accumulated depreciation, less subsequent accumulated impairment losses.

2.8 LEASED BIOLOGICAL ASSETS

The following matrix could be used to determine the applicable accounting standard for the measurement of leased biological assets:

	Lessor	Lessee
Operating lease	AASB 140	AASB 117
	Fair value less estimated costs to sell	Expense the operating lease instalments
Finance lease	AASB 117	AASB 140
		Fair value less estimated costs to sell

Determining the fair value of the biological assets, for the lessor in an operating lease and a lessee in a finance lease, is the focus of this standard.

2.9 LEASED LAND AND BUILDINGS

Leases of land and of buildings are classified as operating or finance leases in the same way as leases of other assets. However, a characteristic of land is that it normally has an indefinite economic life and, if title is not expected to pass to the lessee by the end of the lease term, will be an operating lease.

In accordance with AASB 140, it is possible for a lessee to classify a property interest held under an operating lease as an investment property. If it does, the property interest is accounted for as if it was a finance lease and, in addition, the fair value model is used for the asset recognised.

2.10 LAND IMPROVEMENTS

Land improvements such as roads, bridges, dams and fences constitute non-current assets that are generally clearly separable and thus are readily valued separately under AASB 116 (i.e. cost model or revaluation model).

2.11 INTANGIBLE ASSETS

Intangible assets related to agricultural activity are accounted for in terms of AASB 138. An intangible asset is an identifiable non-monetary asset without physical substance.

An entity can choose either the cost model or the revaluation model (fair value less subsequent accumulated amortisation and subsequent accumulated impairment losses) as its accounting policy in respect of intangible assets.

In the cost model the intangible assets are valued at cost less accumulated depreciation, less accumulated impairment losses. In the revaluation model they are valued at fair value less subsequent accumulated depreciation, less subsequent accumulated impairment losses.

2.12 INVENTORIES

Inventories in the sense used in AASB 102 do not refer to [forest inventory](#).

AASB 102 does not apply to biological assets related to agricultural activity or agricultural produce at the point of harvest (AASB 102:2). AASB 141 is applied to biological assets and agricultural produce, which is the harvested product of the entity's biological assets, only at the point of harvest. After the point of harvest, AASB 102 or another applicable Standard is applied.

AASB 102 does not apply to the measurement of inventories held by producers of agricultural and forest products, or agricultural produce after harvest, to the extent that they are measured at net realisable value in accordance with well-established practice in those industries. When such inventories are measured at net realisable value, changes in that value are recognised in the profit and loss statement in the period of the change. These inventories are measured at net realisable value at certain stages of production. This occurs, for example, when agricultural crops have been harvested and sale is assured under a forward contract or a government guarantee, or when an active market exists and there is a negligible risk of failure to sell.

These inventories are only excluded from the measurement requirements of AASB 102 (i.e. lower of cost and net realisable value). These inventories are therefore valued at net realisable value, even if net realisable value exceeds cost. AASB 102 defines net realisable value as the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale. Determining net realisable value is the focus of this standard.

2.13 FAIR VALUE – AASB DEFINITION

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction (AASB 141:8). The fair value of an asset is based on its current location and condition (AASB 141:9). For example, the fair value of logs is the price for the logs in the relevant market less the transport and other costs of getting the logs to that market.

2.14 FAIR VALUE – FINANCIAL INSTRUMENTS

AASB 139 *Financial Instruments: Recognition and Measurement* may assist to determine fair value, even though forest valuation is not a financial instrument.

The best evidence of fair value is quoted prices in an active market. If the market for a financial instrument is not active, an entity establishes fair value by using a valuation technique. The objective of using a valuation technique is to establish what the transaction price would have been on the measurement date in an arm's length exchange motivated by normal business considerations. Valuation techniques include using recent arm's length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option pricing models. If there is a valuation technique commonly used by market participants to price the instrument and that technique has been demonstrated to provide reliable estimates of prices obtained in actual market transactions, the entity uses that technique. The chosen valuation technique makes maximum use of market inputs and relies as little as possible on entity-specific inputs. It incorporates all factors that market participants would consider in setting a price and is consistent with accepted economic methodologies for pricing financial instruments. Periodically, an entity calibrates the valuation technique and tests it for validity using prices from any observable current market transactions in the same instrument (i.e. without modification or repackaging) or based on any available observable market data. [AASB 139:48A]

AASB 139 does not provide a hierarchy in respect of the various valuation techniques relevant to determining the fair value of financial instruments.

2.15 FAIR VALUE - US GUIDANCE

Market value is a term used by the Appraisal Standards Board of the Appraisal Foundation in the United States which is very similar to that of fair value and its definition may provide further guidance for assessment of fair value:

“The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus.

Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. buyer and seller are typically motivated;
2. both parties are well informed or well advised and acting in what they consider their best interests;
3. a reasonable time is allowed for exposure in the open market;
4. payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and

the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.”

2.16 FAIR VALUE OF BIOLOGICAL ASSETS AND AGRICULTURAL PRODUCE

AASB 141 outlines a hierarchy in respect of the valuation techniques relevant to determining the fair value of biological assets and agricultural produce. Different valuation methods for biological assets and agricultural produce are discussed in sections 3 and 4 of this standard, the choice being influenced by the circumstances as well as the suggested hierarchy.

2.17 ACTIVE MARKET

AASB 141:8 defines an active market as a market where all the following conditions exist:

- the items traded within the market are homogeneous;
- willing buyers and sellers can normally be found at any time; and
- prices are available to the public.

If an active market exists for a biological asset ... the quoted price in that market is the appropriate basis for determining the fair value of that asset. If an entity has access to different active markets, the entity uses the most relevant one. For example, if an entity has access to two active markets, it would use the price existing in the market expected to be used. [AASB 141:17]

ACFA notes that although an active market generally is available for forest produce the market for forests themselves often does not meet the requirements of this paragraph.

2.18 GROUPING OF ASSETS

The determination of fair value for a biological asset or agricultural produce may be facilitated by grouping biological assets or agricultural produce according to

significant attributes; for example, by age or quality. An entity selects the attributes corresponding to the attributes used in the market as a basis for pricing. [AASB 141:15]

2.19 COMBINED FAIR VALUE

Biological assets are often physically attached to land (for example, trees in a plantation forest). There may be no separate market for biological assets that are attached to the land but an active market may exist for the combined assets, that is, for the biological assets, raw land, and land improvements, as a package. An entity may use information regarding the combined assets to determine fair value for the biological assets. For example, the fair value of raw land and land improvements may be deducted from the fair value of the combined assets to arrive at the fair value of biological assets. [AASB 141:25]

ACFA notes the word “may” in this paragraph.

2.20 AGGREGATE VALUE OF ALL ASSETS MUST EQUAL THE FAIR VALUE OF THE ENTITY

Experience in New Zealand in valuing going concerns that have sustainable wood flows indicates that the deduction of current Land value from the present value of the Living Trees and Land, mooted as an option in AASB 141:25, creates an estimate of the annual change in the fair value of Living Trees that can be materially biased if reported.

Land values change materially over the period since the previous valuation. If this option is adopted and material biases arise in the gains or losses attributable to Living Trees, some form of arbitrary adjustment has been suggested through the use of a reconciliation factor. However, such an adjustment inevitably creates problems in reconciling with sum of the component asset values with the aggregate value of the entity and ACFA believes it should not be used where fair value is estimated by calculating the present value of the expected cash flows.

2.21 CONTRACTS TO SELL

Entities often enter into contracts to sell their biological assets or agricultural produce at a future date. Contract prices are not necessarily relevant in determining fair value, because fair value reflects the current market in which a willing buyer and seller would enter into a transaction. As a result, the fair value of a biological asset or agricultural produce is not adjusted because of the existence of a contract. In some cases, a contract for the sale of a biological asset or agricultural produce may be an onerous contract, as defined in AASB 137 Provisions, Contingent Liabilities and Contingent Assets. AASB 137 applies to onerous contracts. [AASB 141:16]

ACFA recommends that the method for determining the prices used in any valuation be discussed, detailed, documented and disclosed.

2.22 FAIR VALUE OF LAND AND BUILDINGS, ACCOUNTED FOR IN TERMS OF AASB 116

The fair value of land and buildings is usually determined from market-based evidence by appraisal that is normally undertaken by professionally qualified valuers (AASB 116:32).

If there is no market-based evidence of fair value because of the specialised nature of the item of property, plant and equipment and the item is rarely sold, except as part of a continuing business, an entity may need to estimate fair value using an income or a depreciated replacement cost approach (AASB 116:33).

2.23 FAIR VALUE OF LAND AND BUILDINGS, ACCOUNTED FOR IN TERMS OF AASB 140

For detail guidelines on determining the fair value of land and buildings accounted for in terms of AASB 140, refer to AASB 140:33-55.

If the purpose of the forest valuation is solely to obtain the change in value of the biological asset for inclusion in the profit and loss statement then the land valuation prepared by the State Valuer General may be appropriate for large (50,000 ha+) forests. Smaller estates or ones with substantial potential higher and better uses require more specific attention and valuation by the valuer.

Depending on the client's instructions and proposed use of the report, the valuation of land and improvements, including roads, will usually be carried out by a Certified Practising Valuer who is a member of the Australian Property Institute.

An alternative in less formal valuations is to use the land valuation prepared by the State Valuer General or similar authority for various purposes including council and utility rating purposes.

2.24 PERIODIC INDEPENDENT VALUATIONS

AASB 141:12 states that the fair value of biological assets should be determined at each reporting date. AASB 141:26 requires the determination of the fair value of biological assets annually, so that the gains or losses from the change in the fair value less estimated point-of-sale costs of the biological assets can be included in the profit or loss statement for the period in which it arises, as discussed in section 2.1 of this standard.

AASB 116:34 states that the frequency of revaluations depends upon the changes in fair values of the items of property, plant and equipment being revalued.

When the fair value of a revalued asset differs materially from its carrying amount, a further revaluation is required. Some items of property, plant and equipment experience significant and volatile changes in fair value, thus necessitating annual revaluation. Such frequent revaluations are unnecessary for items of property, plant and equipment with only insignificant changes in fair value. Instead, it may be necessary to revalue the item only every three or five years. [AASB 116:34]

AASB 140:38 states the fair value of investment property shall reflect market conditions at the reporting date.

Given the uncertainties involved, independent valuation at three yearly intervals would seem a minimum requirement for large forest or medium plantation estates.

3. VALUATION METHODS FOR BIOLOGICAL ASSETS

The assessment of fair value of biological assets, such as living trees, can be achieved by several methods, depending on the purpose of the valuation and the data available.

Although AASB141 outlines a preferred hierarchy of valuation methods, ACFA believes that the advice provided in AASB 139:48A is equally relevant to forest valuations.

If there is a valuation technique commonly used by market participants to price the instrument and that technique has been demonstrated to provide reliable estimates of prices obtained in actual market transactions, the entity uses that technique. [AASB 139:48A]

This suggests to ACFA that forest valuers should consider the methodologies in the order that occurs in AASB 141 but that the decision as to which methodology to adopt should be based on the appropriateness and potential accuracy of the method. Whichever method is adopted the reasons for selecting it over the other methods should be clearly discussed, detailed and documented.

The hierarchy inherent in the International Valuation Standard is consistent with the AASB implied hierarchy although there are some differences in terminology.

3.1 QUOTED PRICE IN THE MARKET

3.1.1 WHEN USED

AASB 141 states:

If an active market exists for a biological asset or agricultural produce, the quoted price in that market is the appropriate basis for determining the fair value of that asset. [AASB 141:17]

As yet, active markets are not evident for the biological asset embodied in forests, so it is unlikely that this method could be used at present. However, it often can be applied to forest produce (as a form of agricultural produce), because active markets generally exist for them.

3.1.2 WHEN NOT AVAILABLE

In the absence of an active market, AASB 141 recommends the following methods for establishing fair value.

If an active market does not exist, an entity uses one or more of the following, when available, in determining fair value:

- (a) the most recent market transaction price, provided that there has not been a significant change in economic circumstances between the date of that transaction and the reporting date;*
- (b) market prices for similar assets with adjustment to reflect differences; and*
- (c) sector benchmarks such as the value of an orchard expressed per export tray, bushel, or hectare, and the value of cattle expressed per kilogram of meat. [AASB 141:18]*

... An entity considers the reasons for those differences, in order to arrive at the most reliable estimate of fair value within a relatively narrow range of reasonable estimates. [AASB 141:19]

3.2 TRANSACTIONS METHOD

3.2.1 WHEN USED

This method is to be used when:

- no active market exists for the biological asset; and
- recent transaction prices, market prices, or sector benchmarks are available for the biological asset or agricultural produce in its present condition.

3.2.2 ACTIVE MARKETS OFTEN NOT AVAILABLE

In Australia, markets for forests seldom meet the definition of an active market because transactions are few and sometimes far between both in time and location and the forests are often variable in characteristics. While this may represent a fundamental limitation, the transaction method needs to be pursued as far as is practicable, if only to provide a check on other methods of valuation which rely on less direct evidence.

3.2.3 DIFFERENT CONCLUSIONS

In some cases, the information sources listed above may suggest different conclusions as to the fair value of a biological asset or agricultural produce. As noted previously a valuer must choose the most reliable estimate of fair value within a relatively narrow range of reasonable estimates.

3.2.4 TRANSACTIONS DATA

Fair value is most clearly identified with arms length transactions in the market place. Hence the search for transactions data on the sale prices of similar forests (or plantations) is an initial starting point for any valuation of a forest.

3.2.5 RELATING DATA TO FOREST BEING VALUED

Forest valuations based on transactions data need to take account of the differences in:

- species
- location
- scale
- site productivity and uniformity
- age
- stocking
- log quality
- access and harvesting conditions
- any in-place wood supply agreements, and
- natural and man-made hazards.

Differences in market conditions also need to be taken into account including those due to:

- inflation
- cyclical (eg, housing, business cycles) and secular (long term) trends in product prices at particular points in time relative to the current
- the numbers of potential buyers in the relevant location, and



- strategic factors, such as market entry or exit and consolidation of estates.

Some of these differences can be taken into account quantitatively by adjusting for differentials that are well established in the market, such as the added cost of log haulage from a more distant location. Others rest on professional judgement of the effect of the differentials in terms of cost or price. Manley and Bell³ provide an example of an analysis of sales by estimating a relationship between the prices paid for New Zealand State-owned plantations and their underlying characteristics.

3.2.6 DISCLOSURE OF ADJUSTMENT

Whatever the form of the adjustment used to develop a transactions-based value, the method (not necessarily the data, if confidential) needs to be disclosed in the valuation report.

Note the earlier comment that the onus of the proof of reasonableness of forecasts used in valuations is on the person making the forecast.

3.2.7 REPORTING LAND VALUE

Even if transactions data are lacking for forest estates, they will normally be available for land under forestry or other uses, either directly through transactions or indirectly through valuations by the State Valuer General or similar authority. These data need to be collected for any forest valuation because they provide the basis for the valuation of the land on which the trees are growing.

3.2.8 NUMEROUS TRANSACTIONS

Even where numerous transactions are seemingly available for analysis, care should be taken to ensure that the markets are truly active and that transactions made between willing and knowledgeable buyers and sellers.

ACFA notes allegations that sellers have not always been knowledgeable in seemingly active markets.

3.2.9 IVSC NOMENCLATURE

This approach is called the Direct Market Comparison Approach in the International Valuation Standard.

3.3 PRESENT VALUE METHOD

3.3.1 WHEN USED

This method is to be used if:

- no active market exists for the biological asset; and
- market-determined prices or values are not available for the biological asset in its present condition, or cannot be inferred from available transaction evidence.

This method can be used if the purpose of the valuation is for financial transaction or financial management purpose.

³ Manley, B. and Bell, A., 1992. Analysis of the value of the State plantations sold in 1990. *NZ Forestry* 42(4): 22-7.

3.3.2 NOMENCLATURE

The International Valuation Standard uses the term Income Approach and divides the approach into income capitalisation and discounted cash flow alternatives.

3.3.3 DISCOUNTED VALUE OF FUTURE NET REVENUES

The [Present Value](#) method entails predicting the future flows of wood over time, the prices and costs that are involved, and discounting the resulting net revenues back to the base date of the valuation. The term Present Value (PV) has many similar terms, including Net Present Value, Discounted Cash Flow, Discounted Net Revenue, and Land Expectation Value each of which has a specific definition. The latter reflects the long history of this form of analysis in forestry, attributable to Faustmann⁴.

Whether the wood flows are predicted wood flows for a management strategy or are the wood flows scheduled for industry should be clearly discussed and documented.

3.3.4 OBJECTIVE

The objective of a calculation of the present value of expected net cash flows is to determine the fair value of a biological asset in its present location and condition. An entity considers this in determining an appropriate discount rate to be used and in estimating expected net cash flows. In determining the present value of expected net cash flows, an entity includes the net cash flows that market participants would expect the asset to generate in its most relevant market. [AASB 141:21]

In sustainably managed forests, the growth expected from the future application of normal silvicultural treatments such as fertilising or thinning is considered a valid part of the future wood and cash flows and therefore of the Present Value analysis.

ACFA recommends that future growth be taken into account, consistent with the emphasis on estimating the fair value of the entity as a going concern.

3.3.5 EXCLUDES

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). [AASB 141:22]

3.3.6 PLANNING HORIZON

Within a forest estate, Living Trees (see earlier) and other biological assets are different from non-living assets because they undergo change over time through growth, mortality, treatment and natural hazards. These changes affect the discounted expected cash flows, changes in the future prices of products and the future costs of management operations. Measuring the fair value of a forest requires that account be taken of all these sources of possible change in future net revenues at each reporting date.

The limitation on replanting clearly applies to a Forestry Right in which only the rights to then current Living Trees were purchased. It may also be a useful method where no material discounted net revenue is expected from subsequent rotations.

However, for those entities operating as a sustainable going concern, Present Value may need to take account of replanting or regeneration costs and the associated yields and revenues. Wood and cash flows from intermediate thinnings from subsequent crops beyond the current rotation may be material in sustaining industry demands and

⁴ Faustmann, M., 1995 [1849]. On the determination of the value which forest land and immature stands pose for forestry. Trans. W. Linnard), *Journal of Forest Economics*, 1(1). 7-44



development and thus affect the estimate of fair value. Forest valuers need to exercise professional judgement on the assumptions used in evaluating present value. The choice should be based on the achieving the best estimate of fair value in an active market. The rationale for the choice should be disclosed.

The terminal value needs to be recognised at the end of the final rotation used in the estimation of present value. This can be estimated from the higher of the Present Value of a perpetual series of rotations (the Faustmann solution) or the forecast present value of the land in this or the best alternative use. In the latter case, costs associated with returning land to a condition suitable for sale may need to be included, as does the optimum time at which to harvest.

Where re-afforestation is not profitable at the relevant discount rate, the consultant should inform the owner of this, and the reasons.

3.3.7 VARIATIONS

In agreeing an arm's length transaction price, knowledgeable, willing buyers and sellers consider the possibility of variations in cash flows. It follows that fair value reflects the possibility of such variations. Accordingly, an entity incorporates expectations about possible variations in cash flows into either the expected cash flows, or the discount rate, or some combination of the two. In determining a discount rate, an entity uses assumptions consistent with those used in estimating the expected cash flows, to avoid the effect of some assumptions being double-counted or ignored. [AASB 141:23]

3.3.8 LIMITED TO EXISTING LAND BASE

The future flows of wood are to be predicted for the existing forest or plantation, plus any other land for which there is a commitment to purchase and reforest.

The land base does not include future new plantings for which the entity does not control the land asset by dint of purchase, lease or other binding agreement (AASB 141:10). Valuations to meet AASB 141 must take care to ensure that the appropriate land base is used.

The land base used may be quite different for other forest valuations, and in these cases it is necessary to document and disclose what has been used to meet the Terms of Reference, and why.

3.4 LUMP SUM METHOD

3.4.1 WHEN USED

In relation to the terminology of AASB 141, the Lump Sum method can be regarded as either a variant of a sector benchmark method or of a Present Value method that involves no future costs or revenues.

3.4.2 LUMP SUM VALUE OF LIVING TREES

Small forests or plantations for which suitable transactions data are not available may be valued by estimating separately the value of the Land and the value of the Living Trees. Small forests or plantations are those in which the harvest and sale of the resulting wood could potentially be arranged in a year or so without the undue disruption of markets and prices otherwise associated with a forced sale of a substantial volume of wood.

Under the above conditions, the value of the Living Trees can reasonably be estimated by applying the current prices to the estimated volumes of wood in the various grades and assortments that would be expected to be available if the trees were to be harvested in



the base year, and deducting all costs borne by the owner that are associated with the harvesting and transport to market.

The method is also sometimes called the immediate liquidation method or liquidation method. Those terms should not be used because of their connotation with a forced sale.

The lump sum value may need to be adjusted to account for the value implications of releasing that volume of wood onto a market.

It may also need to be adjusted to account for the risks involved in such a sale.

3.4.3 LAND VALUED ACCORDING TO HIGHEST AND BEST USE

The fair value of land and land improvements for financial reports should be established from market-based evidence by a professionally qualified valuer. For less formal valuations, fair value may be estimated from the prices obtained for comparable land, or from official valuations, according to the highest and best use.

As detailed later, because the forest is inextricably linked to the land the combined value in the highest and best use must be based on salvage value (or lump sum value) at time of valuation less costs of conversion from forest to the highest and best use, and less the cost of any expected delay in reaching full use in that highest and best use.

3.4.4 NOT APPLICABLE TO IMMATURE FORESTS

Immature forests yield few if any marketable products and cannot be so valued.

3.4.5 TESTS OF ACTIVE MARKETS AND ADJUSTMENTS FOR MARKETS THAT ARE NOT ACTIVE

The primary test to be applied is whether the trees could be sold in a lump sum sale in an active market without major disruption by way of impact on price. A major disruption might be a potential decrease in price of more than 10-20%.

Because State agencies or private companies with large forest estates sometimes dominate local markets for wood, the assumption of a lump sum sale at going prices needs to be treated with care. The test is whether those prices could be achieved in an in arm's length transaction between willing and knowledgeable parties.

If the market is not active, some adjustment of prices may be necessary together with disclosure of the basis of professional judgement, or an alternative method of valuation may have to be adopted.

3.4.6 SELDOM APPLICABLE TO LARGE AND MEDIUM FORESTS

Large and even medium-sized forest estates or plantations generally do not meet this test. It is simply not possible to quit the volume of living trees from such a forest in a short period of time.

The following table sets out the approximate ratios of the volume of living trees in a large estate relative to the annual cut for a hypothetical long-term sustainable business.



Approximate ratios of the volume of Living Trees to annual cut for long-term sustainable business.

Forest type	Main product	Rotation (yrs)	Approximate Ratios
Native forest (such as jarrah)	Sawlogs	200	100
Native forest (such as blackbutt)	Sawlogs	80	40
Pine plantation	Sawlogs	30	15
Blue gum plantation	Pulpwood	15	7

The actual ratios depend largely on the number of years over which planting has been conducted in the case of plantations, or the distribution of age of size classes in native forests. This highlights why the Tasmanian Auditor-General⁵ inferred that valuation of the State-owned forests based on immediate sale of the volume was meaningless. Such an assumption is not consistent with the disposal of an asset in an active market.

3.4.7 MARKET-DETERMINED PRICES IN AN ACTIVE MARKET UNDERPIN LUMP SUM METHOD

Underpinning the method is the reference in AASB 141:17 to the sale of agricultural produce.

If an active market exists for a biological asset or agricultural produce in its present location and condition, the quoted price in that market is the appropriate basis for determining the fair value of that asset. If an entity has access to different active markets, the entity uses the most relevant one. For example, if an entity has access to two active markets, it would use the price existing in the market expected to be used. [AASB 141:17]

Markets for the sale of wood from small forests may become erratic in price and conditions because of 'take or pay' clauses attached to the supply contracts or agreements with large forest or plantation owners. The tenor of AASB 141 indicates that the choice of prices must rest with the valuer's judgment of the best indicator of fair value, together with disclosure of the rationale. This may involve a reduction in price and/or a deferral of harvest from the optimum age, in order to recognise the realities of an uncertain and difficult market.

3.5 COST BASED METHODS

3.5.1 WHEN USED

This method can be used under special circumstances prescribed below for formal financial reporting.

Cost may sometimes approximate fair value, particularly when:

- (a) little biological transformation has taken place since initial cost incurrence (for example, for fruit tree seedlings planted immediately prior to reporting date); or*
- (b) the impact of biological transformation on price is not expected to be material (for example, for the initial growth in 30-year pine production cycle). [AASB 141:24]*

⁵ McHugh, A.J., 1993. Audit Report, Forestry Commission 30/11/93. The author, Hobart



This method is often used for insurance purposes.

3.5.2 WHY USED

Cost based approaches involve the accumulation of costs to provide an estimate of value. Costs based approaches have appeal for a number of reasons;

- a preference in some cases to value young stands on the basis of replacement cost rather than future expectations, and,
- the influence of accounting practice and the concept of objectivity.

3.5.3 WEAKNESS

The fundamental weakness of these approaches is that cost generally does not equal value. As noted by Davy (1987)⁶ a “high” cost forest does not necessarily equal a “high” value forest and conversely a “low” cost forest does not necessarily mean a “low” value forest.

3.5.4 INSURANCE PURPOSES

A historical cost compounded to the present is used as a proxy for the opportunity cost for some valuations for insurance purposes. However it may underestimate because;

- there may be an additional cost for clearing the young plantation killed by fire and this, together with any offsetting salvage value, needs to be taken into account, and,
- any replaced forest would be younger and that may impact wood flows and future cash flows.

In the current replacement cost method, stand value is calculated as the sum of costs compounded forward from time of occurrence to the present day. Costs are generally expressed in current day dollars and standard costs, representing current efficient practice, are generally used for each operation.

It is common to be able to insure for the value of the crop plus site clearing and replanting. The insured value may therefore need to be adjusted to approximate the biological asset value.

⁶ Davy, A. (1987) Accounting for forestry activities in New Zealand. *New Zealand Society of Accountants Research Bulletin* R117

4. SPECIAL ISSUES IN VALUATION

While the methods described in section 3 of this standard span the principal methods to be used in valuation, some issues arise for forest estates or plantations with particular characteristics. The details of the methods to be applied in these cases vary widely and largely rest on professional judgement.

4.1 VALUING THE HIGHEST AND BEST USE

4.1.1 VALUING THE HIGHEST AND BEST USE

This issue reflects the inability to separate the roles of the Living Trees from the Land on which they grow in determining the respective values of the combined asset, a problem long recognised in forestry.

In section 2 it was noted that AASB 141:25 explicitly recognises this and allows that the “*fair value of land and land improvements may be deducted from fair value of the combined assets to arrive at the fair value of the biological assets*”. Forest valuers may therefore adopt the deduction approach although it is not mandatory.

ACFA consider that the solution is to use a methodology that is consistent with the AASB prescription that only the Living Trees be used as a basis for the fair value of the biological asset (the SGARA value), as well as with the fair value of the combined asset in its highest and best use.

The highest and best use of a medium to large-sized forestry entity is the higher of the present value of the combined asset as a going concern and the present value of the best alternative land use. The present value is;

- the optimum discounted salvage value of the Living Trees,
- less the costs of rehabilitation,
- less the cost of any delays in converting the land to full production in the alternative use,
- plus the value of the land and land improvements in the best alternative use.

Risk may also need to be taken into account.

The US Financial Accounting Standard SFAS 157 Fair Value Measurements provides useful guidance in paragraph A11 which states, using an example of a factory that might be sold for real estate.

In this instance, the highest and best use of the land would be determined by comparing (a) the fair value of the manufacturing operation, which presumes the land would continue to be used as currently developed for industrial use (in-use) and (b) the value of the land as a vacant site for residential use, considering the demolition and other costs necessary to convert the land to a vacant site (in-exchange). The highest and best use of the land would be determined based on the higher of those values.

4.1.2 WHERE FORESTRY IS THE HIGHEST AND BEST USE

Where a present value estimate is used and forestry is the highest and best use of the going concern, ACFA recommends the following procedure.

Step 1. Optimise the present value of the combined asset by mathematical programming or simulation to determine the best schedule of wood flows over an extended planning horizon for both the current and future tree crops. This provides the Fair Value (or Net Market Value) of the combined asset and approximates the expected transaction value if the combined asset was to be sold. If the value under pre- and post-tax [discount rates](#) differ

materially, ACFA recommends post-tax analysis. The choice of discount rate used needs to be fully documented.

Step 2. Segment the cash flows in (1) into those that relate solely to the Living Trees (the biological asset as defined in AASB 141) and the value of the Subsequent Rotations. This biological asset value is used to calculate the annual change in the value which goes into the income statement and hence the profit or loss statement. As in Step 1, the choice of discount rate used needs to be fully documented and should be consistent in this and subsequent calculations.

Step 3. Determine the value of land and improvements and bring to account as a [non-current asset](#) under Property, Plant and Equipment.

Step 4. Deduct this value from the present value of the combined asset (see Step 1 above) to derive the present value of the biological asset plus that of the Subsequent Rotations.

Step 5. Deduct the biological asset value in Step 2 from Step 4 and bring the result to account as the present value of Subsequent Rotations under Property Plant and Equipment.

Step 6. If the discounting in Step 1 and Step 2 is not based on the pre-tax discount rate, ensure that the taxation effects have been appropriately brought to account without double counting (see AASB 112). Where AASB 141 applies a pre-tax rate must be used.

Where the land is owned by the reporting entity, periodic revaluations of land in the best alternative use and the rationale for the above approach should be disclosed in notes to the estimates. This value should not be shown as a non-current asset under Property, Plant and Equipment because it would involve a double counting of the asset.

4.1.3 WHERE FORESTRY IS NOT THE HIGHEST AND BEST USE

If forestry is not the highest and best use of the combined asset, the fair value of it is, as noted earlier, the optimum discounted salvage value of the Living Trees less the costs of rehabilitation plus the value of the land and land improvements in the best alternative use. To avoid double counting of non-current assets, no biological asset (or SGARA) value should be brought to account under non-current assets but a note disclosing it, and the rationale, should be attached to the estimated gain or loss in the biological asset shown in the profit or loss statement.

4.1.4 EVEN-AGED NATIVE FORESTS

In principle, the valuation of medium to large-sized native forest entity using even-aged silviculture is exactly the same as that recommended above, although the planning horizon may be much longer.

4.1.5 UNEVEN-AGED FORESTS

For a medium to large-sized native forest entity in which uneven-aged forests are harvested under selection, gap or group-selection silviculture, the present value would be calculated over successive cutting cycles to a fixed and long distant planning horizon, but the process is otherwise similar in principle.

4.1.6 COPPICE FORESTS

The accounting treatment of coppice rotations is nominally more complicated because the coppice remains a biological asset after harvesting and thus the biological asset value is linked to the number of coppice rotations undertaken until the coppice is removed and new seedlings are planted. In all other respects, the recommended practices hold for coppice.

4.1.7 CONSISTENCY AND CARE IN ESTIMATION

It is important to ensure that the components in the financial reports are all consistent and complete; including the fair value of non-current assets and the fair value of the biological asset (the SGARA value) on which the change in biological asset value reported in the profit and loss statement is based.

4.1.8 DISCLOSURE OF ASSUMPTIONS

ACFA recognize that these interpretations may involve difficult professional judgements. ACFA recommend that the underlying assumptions used and the effects on the various valuations be disclosed, discussed and fully documented.

4.2 PARTICULAR CASES

4.2.1 IMMATURE FORESTS

Immature forest estates and plantations often have no active or liquid market for the living trees because they are too young and small to be saleable. Present Value methods can often be applied to immature forest estates, and are generally appropriate for financial reporting.

In the event that an immature plantation of very young age has a negative Present Value, and the valuer is satisfied that the discount rate used is appropriate, the loss transfers to the profit and loss statement accordingly. Section 5.4.4 of this standard must be considered. The client will presumably heed this warning in entertaining any future planting.

The current replacement cost method may be justified for insurance purposes (but not valuation of the biological asset) where written into the contract. In the case of plantations, living trees are commonly insured against fire damage up to an age at or about which they can yield saleable products - typically about 10-15 years for a radiata pine plantation. The basis of the insurance is that fire-killed [non-living produce](#) is generally unsaleable at these ages. In this event, the insurer is generally liable for the compounded cost of establishment. Hence the compounded cost of establishment, or some agreed basis reflecting site productivity and costs, may be used to value immature plantations for insurance purposes.

This method should not be used for valuation of the biological assets because it does not conform to the underlying principle of determining the best estimate of fair value in an active and liquid market. This also serves to illustrate that AASB 141 is not always appropriate for all valuations.

4.2.2 INTERMEDIATE CASES

Some forest estates do not meet the criterion of small size, because the biological assets cannot be harvested and sold in the space of one year, or because they are relatively newly established, or are without age or size classes typical of the expected final crop at rotation age.

Transactions data are often lacking for such intermediate cases. The Present Value method can be applied, but on what assumptions, when no experience is available on the sale of the species in the particular area?

The tenor of AASB 141 indicates that the choice of assumptions must rest on the independent consultant's judgment of the best indicator of fair value, together with sufficient disclosure of the assumptions, other than confidential data, to justify that choice.

4.2.3 PRIVATELY-OWNED NATIVE FORESTS

For native forests in Australia, the State agency concerned is often the dominant supplier because of the extent of publicly owned native forest managed for wood production and other uses. Markets for the sale of wood from privately owned forest might then become erratic in price and conditions because of 'take or pay' clauses attached to the State supply contracts or agreements. Similar problems may arise wherever one grower (native forest or plantation) dominates the market because of size of holding and contracts with purchasers.

The tenor of AASB 141 indicates that the choice of prices must rest with the valuer's judgment of the best indicator of fair value, together with disclosure of the rationale. This may involve a reduction in price and/or a deferral of harvest from the optimum age, in order to recognise the realities of an uncertain and difficult market.

4.2.4 PUBLICLY-OWNED NATIVE FORESTS

Most of the provisions pertaining to the Present Value method for large forests can be applied to publicly-owned native forests managed for multiple uses that include wood production. These generally involve joint production of wood together with non-commercial uses and services and it is this mix of biological asset and non-current asset considerations that makes such valuations problematic.

4.2.5 MULTIPLE USE CONSTRAINTS

If the other uses of multiple use forests were commercial, there would be comparatively little problem in extending the principles already enunciated to cover the valuation of joint production of those uses. But most are not. In addition, knowledge of the inter-relationships between uses is commonly limited and it is therefore necessary to protect the supply of them by relatively arbitrary constraints and devices.

For example, in order to maintain natural genetic diversity, improved genetic stock cannot be used in many publicly owned native forests in Australia. More reliance is placed on natural regeneration or the use of planting stock raised from local seed. Rotation lengths are extended⁷ well beyond the economic optimum for wood production in the interests of maintaining a diversity of structural ecosystems and communities, and associated habitat for fauna.

Silvicultural systems may be modified in places to protect scenic, habitat or conservation values, clear-felling systems being considerably modified or replaced by selections systems. Habitat or nesting trees have to be retained for fauna protection, to the potential detriment of the growth of trees in the immediate vicinity containing or producing commercial wood. The quality of water production is protected by buffer strips in which harvesting is not allowed along streams and rivers and by amelioration measures following the completion of harvesting along snigging trails and on landings. The aggregate quantities of wood to be removed from a region are also constrained to ensure sustainability of supply.

4.2.6 PRESENT VALUE CIRCULAR FOR PUBLICLY-OWNED NATIVE FORESTS

As a result, the forest manager is no longer free to choose the most economically efficient manner of operation. The future pattern of wood production flows and cash flows do not reflect the entrepreneurial choice that might maximise the value of the forest as a wood producer.

⁷ For example, the rotation length for mountain ash forest in Victoria is generally at least 80 years, often more, compared with the optimum economic length of about 50 years.

Any valuation based on Present Value is therefore circular in that it simply reflects the planned pattern of regulated multiple use of that forest, not the optimum value when used for wood production alone under minimal constraints. Notwithstanding this circularity, the Present Value of wood production in a multiple use forest may provide a useful comparison over time that summarises any changes to the regulatory conditions, as well as to other conditions affecting wood production.

It does not, however, provide any useful guidance as to the return on capital investment, either singly for wood production or for other or all uses, because of the strictly derivative nature of the Present Value, given the net revenue flows.

4.2.7 DISCLOSURE OF CONSTRAINTS FOR NATIVE FORESTS

Forests, especially native forests, are often subject to regulatory constraints that exclude wood production, such as buffer strips along streams, wildlife corridors and reserves to protect endangered species. Where these can be clearly delineated, they should be excluded from the area being valued for wood production, and reported separately in terms of the area involved. Valuation of such areas is not yet resolved because although wood production might be the highest and best alternative use, and in some cases the only alternative use, it is not allowed⁸. AASB 141:49 now only requires that:

An entity shall disclose:

- (a) the existence and carrying amounts of biological assets whose title is restricted, and the carrying amounts of biological assets pledged as security for liabilities;*
- (b) the amount of commitments for the development or acquisition of biological assets; and*
- (c) financial risk management strategies related to agricultural activity.*
[AASB141:49]

Where clear delineation is not possible, as in the case of retained habitat trees, fair value should be based on the future cash flows, recognising the impact of those retained trees on the surrounding trees being grown for wood production.

4.2.8 LEASED FORESTS

Refer to section 2.8 (leased biological assets) and section 2.9 (leased land and buildings) of this standard to determine which accounting standard is applicable. Leases which effectively transfer substantially all of the risks and benefits pertaining to ownership of the Land to the lessee are to be treated as finance leases under AASB 117. In effect they are treated as if the lessee had purchased the asset and borrowed the funds. The initial present value of the minimum lease payments is disclosed as an asset and as a liability in the first year of the lease and thereafter the asset value is depreciated in the normal way. The (non-current) liability is adjusted annually by a reduction equal to the implied interest expense while any remainder of the minimum lease payment is shown as a direct expense, as are any contingent rents⁹.

⁸ For example, the 2010 Annual Report of Parks Victoria values the land involved, other than that which is improved, at zero. The 2010 Annual Report of the Department of Sustainability and Environment values that same land at positive values based on the estimates of the Valuer-General.

⁹ Contingent rent is that portion of the lease payments that is not fixed in amount but is based on the future amount of a factor that changes other than with the passage of time (e.g. percentage of future sales, amount of future use, future price indices, future market rates of interest). See AASB 117.

Leases in which the lessor effectively retains much of the risks and benefits pertaining to the Land, such as certain types of sharing and joint venture¹⁰ arrangements, are treated as operating leases under AASB117. These do not appear as assets or liabilities in the Statement of Financial performance of the lessee because the assets are not effectively owned by the lessee. For these, the minimum annual lease payments are recognised as a direct expense, as are contingent rents.

Thus, regardless of the form of lease, the lease payments are recognized either directly in the valuation of the combined asset through the expected cash flows or, additionally in the case of finance leases, through a deferred liability in the non-current asset statement. It is therefore appropriate to value the combined asset in the manner recommended earlier, regardless of ownership, and to use the annual gain or loss in present value of Living Trees (the biological asset or SGARA value) as the appropriate amount for the Income Statement and Profit or Loss.

4.2.9 JOINT VENTURE AND SHARE-FARMING FORESTS

In the case of joint venture forest estates, the normal method of valuation will be to deal with the forest as a whole and then to apportion the Present Value in accord with the terms of ownership in the joint venture.

Similarly for share farming, although in this case the apportionment of value between the parties will probably require individual calculation of Present Values for each party, given that the cost and revenue stream are often borne unequally and at different times.

4.2.10 OTHER FORMS OF VALUATION

As noted earlier, not all valuations or appraisals are concerned with financial reporting. It is not possible to set standards for each and every other form of valuation. The Terms of Reference should clearly state the purpose of the valuation, enabling the consultant to develop an appropriate approach.

¹⁰ Joint venture in forestry practice sometimes involves complete control by the lessee and therefore does not qualify as a 'joint venture' under AASB 131 but in some cases control is shared jointly.

5. PRESENT VALUE DETERMINATION

This section addresses further details in the determination of Present Value, some aspects of which may be relevant for other methods.

5.1 GENERAL

5.1.1 RECORD KEEPING

The theory of discounting¹¹ is dealt with in many texts and, more importantly, the formulae are available in user selectable functions in commercial computer-based spreadsheets such as Excel[®].

Much of the laborious work otherwise associated with the calculation of Present Value given the proposed schedule of wood flows can be handled by using spreadsheet or more sophisticated programs, even for large forest estates.

Care should be taken to ensure that the calculations are carried out in the correct manner.

Copies of calculations and all related records and documentation should be retained in the event that a valuation is challenged.

5.1.2 ACCRUAL ACCOUNTING

[Accrual accounting](#) is the recommended basis for use in valuation and financial reporting for members of the Association of Consulting Foresters of Australia for all but the simplest and least formal of valuations or appraisals.

AASB 101:27-28 state that:

An entity shall prepare its financial report, except for cash flow information, using the accrual basis of accounting. [AASB 101:27]

When the accrual basis of accounting is used, an entity recognises items as assets, liabilities, equity, income and expenses (the elements of financial statements) when they satisfy the definitions and recognition criteria for those elements in the Framework. [AASB 101:28]

5.1.3 WITHIN YEAR TIMING

Expenses and revenues (in essence cash flows) often occur throughout the financial year, rather than at either end of it. Most valuations based on Present Value ignore these differences. In commercial entities with well-developed accounting systems, any issues associated with the timing of expenses or revenues within the year are assumed to be reflected in interest payments by, or earnings to, the entity and are thus represented in either expenses or revenues. Thus both expenses and revenues (cash flows) can be assumed to fall at the end of each accounting period (normally one year) and discounted accordingly.

Where less formal valuations or appraisals are involved, and accounting systems are less well developed, adjustments for the timing of expenses and revenues within any one year are seldom of material consequence in the final valuation. Thus expenses are generally assumed to be incurred at the start of the year and revenues received at the close of the

¹¹ Davis and Johnson, *op.cit.*,
Brealey et al. *op.cit.*, and
Pearce, P. H., 1990 *An Introduction to Forest Economics*. University of British Columbia Press,
Vancouver, 226 pp.



year. Nevertheless, this is an issue that needs to be considered in relation to the materiality (see later) and may warrant change and adjustment in particular circumstances.

The basis used should be disclosed.

5.1.4 MONEY OR REAL VALUES

All financial data should be consistent in terms of the treatment of inflation – that is either all [‘money’ or all ‘real’ values](#).

AASB 141 does not provide any direction as to which should be used.

ACFA considers that in general, ‘real’ (free from inflation) values are to be preferred because of the difficulty of predicting future inflation.

If a valuer has reasonable evidence of past secular trends in real costs or real [log prices](#) that are very likely to continue in the immediate future, the basis for the evidence should be documented. Those trends may then be reflected in the future cash flows. However, prudence suggests that such trends should be restricted to reasonable periods not exceeding five years and not extrapolated out over very long periods.

5.2 EXPENSES

5.2.1 GUIDELINES

Expenses should be:

- **complete and current at the date of valuation, and include all expenses associated with the business of wood production or other commercial use of forest, with appropriate allocation of [joint costs](#),**
- **consistent with the forest estate and business activities – if the business is said to be managed according to ‘best practice’ precepts, the capacity and experience of staff to do so needs to be checked and attested to,**
- **checked against external data wherever possible,**
- **explicit as to the nature of any assumptions as to future cyclical and/or secular trends in real prices or exchange rates, and,**
- **reliable in the sense of being sufficiently precise and free from [bias](#) to avoid misleading readers of the report – and with appropriate reporting of contingencies.**

The expenses to be used in valuation should reflect actual costs in the forest concerned or in comparable operations, either as estimated from cost records, from contract rates in the area, or by professional judgement. **The basis of the estimates should be disclosed.**

5.2.2 ALLOCATING JOINT COSTS

Some forests and plantations, especially publicly owned native forests, involve joint costs in which the cost is attributable to both wood and non-wood goods and services. Common examples include fire protection, and roads constructed or improved both for log haulage during the week and recreation during the weekend. In the former case, for example, a distinction has to be made for the costs of fuel reduction burning around recently regenerated areas, or regeneration or top disposal burns, because these are costs specific to commercial wood production. Where fuel reduction burning is carried out as part of a general strategy to reduce hazards to the forest as a whole, or to neighbouring communities or property, the costs should not generally be borne solely by the wood production entity.

Where joint costs are involved, the general approach is to determine revenue and then match against that the expenses involved in generating that revenue. Matching is not always easy. If joint costs cannot be allocated on the basis of cause and effect, systematic and rational allocation (for example in the case of depreciation) or immediate recognition (for example in the case of advertising) may be used¹². However, if the other product is a waste or by-product of the process, it may not be not-allocated as a joint cost. See also AASB Framework¹³.

AASB 102:14 also provides some assistance.

...When the costs of conversion of each product are not separately identifiable, they are allocated between the products on a rational and consistent basis..." [AASB 102:14]

Allocation of joint costs should be clearly detailed and the basis for the allocation should be disclosed.

5.2.3 CHECK TOTALITY OF DIRECT AND INDIRECT COSTS

Overhead or indirect costs represent one of the most difficult components to estimate where they are not directly available from the accounting records of the entity concerned. Cost accounting conventions frequently vary widely between organizations, and these conventions are often not made explicit¹⁴. Overhead costs are often under-estimated where detailed records are not available to reconcile and check the totality of direct and indirect costs.

Research and development costs pose an issue as to recognition as capital or current operating costs. With few exceptions, such as major capital equipment or works, they are normally expensed as current operating costs because the future revenue flows are spread widely into the future and are uncertain in timing and identification. Once the effect of a new technology (for example site preparation, fertilising, weed control or tree breeding) is known, it should be reflected in the growth and yield functions used to predict future yields.

Expenses may include depreciation of capital assets (other than bio-logical assets) at approved Australian Taxation Office rates. Unless this is done, there will be an inconsistency between the cost of these services that are leased and those that are serviced by the entity's own capital.

5.2.4 DISCLOSURE OF CONTINGENCIES

Contingencies (expenses or revenues) represent potential obligations or benefits that are possible but unlikely, and cannot be estimated with any reliability.

The potential impact of contingencies should be evaluated and disclosed as notes in the valuation report if they could have a material effect on the outcome, even though they cannot be included in the calculating Present Value.

¹² Godfrey, J., Hidgson, A., Holes, S. and V. Kam, 1994. Accounting Theory. 2nd Ed. J. Wiley, New York., 1994

¹³ AASB (2007) Framework for the Preparation and Presentation of Financial Statements. Available from www.aasb.gov.au.

¹⁴ Forest Review Steering Committee, 1996. Maximising the Value of the State's South-east Forest. Department of Premier and Cabinet, S.A., Adelaide

5.2.5 APPORTIONING OF EXPENSES FOR THE BIOLOGICAL ASSET

AASB 141:21 now states that:

The objective of a calculation of the present value of expected net cash flows is to determine the fair value of a biological asset in its present location and condition. [AASB 141.21]

Consistent with this and interpretations of the previous wording of this clause, ACFA takes this to mean while the effect of past and current tree breeding or fertilisation on the Living Trees and their growth is to be taken into account to the degree that reasonable evidence is available, any enhancements of forest produce following harvesting cannot, whether through biological transformations or re-dressing logs or selling activities.

The apportioning of overhead expenses between the biological asset, defined as the Living Trees, and the subsequent rotations component of the combined asset needs to be carried out carefully. For example, research expenditures are almost invariably expensed off in the year incurred. In any particular year, this amount needs to be apportioned between the Living Trees and any replanting, most probably on the basis of the areas involved.

5.2.6 AVERAGING ACROSS YEARS

Future costs are best estimated based on three or five year moving averages of past real costs, or similar predictive equations, to remove the inevitable past fluctuations associated with particular areas or operations.

Whatever costs are used it is necessary to clearly discuss, document, detail and disclose the bases used.

5.3 REVENUES

5.3.1 GUIDELINES

Revenues should be:

- **complete and current at the date of valuation, and include all revenues associated with the business of wood production and other commercial use of forest,**
- **based on the revenues attributable to the living trees – that is, net of harvesting costs,**
- **checked against external data on stumpage prices for similar log grades and qualities, with due allowance for location and other differences,**
- **explicit as to the nature of any assumptions as to future cyclical and/or secular trends in real prices or exchange rates, and,**
- **reliable in the sense of being sufficiently precise and free from bias to avoid misleading readers of the report, and with appropriate reporting of contingencies.**

5.3.2 REVENUES NET OF COST OF HARVESTING

Under AASB 141 the revenue from the harvest of biological assets (for example logs) is deemed to be received immediately after that produce becomes non-living (at point of harvest) and must be calculated net of any expense incurred in harvesting.

As noted earlier, for calculating net revenue flows, revenues and expenses are generally assumed to be received and incurred at the end of the year, with interest payments and charges taking up the differences in timing.

In making any comparisons of revenues net of the cost of harvesting between entities, account should also be taken of differences in the extent of exports and the implications of the Goods and Services Tax.

5.3.3 DISCLOSURE OF SOURCES OF AND BASES FOR PRICE ESTIMATES

Some near-current prices for logs¹⁵ are now published and provide a basis for checking the prices received or estimated, given appropriate adjustment for differing conditions such as log haulage distance and log grades.

The prediction of future real prices and revenues is more difficult and uncertain. While current trends in business activity may in some cases enable the current trend of prices in the housing or business cycle to be predicted reasonably precisely, cycles beyond the current become so uncertain as to make predictions meaningless. As noted earlier, prudence suggests that secular trends should not be applied much beyond five years hence, unless there is very strong evidence to the contrary. Most valuations therefore adopt a constant real price beyond five years hence.

The most common method is therefore the hybrid model of forecasting in which prices are predicted for the immediate year or, at most, two years, if possible, based on professional judgement of the trends over those years or so. Beyond that period, to about five years hence, real price is generally predicted on the basis of the predicted secular trend, which in turn is based on an analysis of historical trends with due recognition of major shifts expected in demand or supply. Beyond about five years a constant price is generally adopted.

Whatever the basis used for forecasting current and future log prices, sufficient information needs to be disclosed for the reader to understand the general basis used, having due regard for possible commercial confidences. If that basis is changed in subsequent reports, it is essential that the general nature of the change and reasons for it be disclosed.

5.3.4 NON-WOOD PRODUCTS

Commercial non-wood revenues that accrue to the entity need to be accounted for in the same manner as those for wood, and maintaining the distinction so that seed, resins and gums etc. form a part of the biological asset valuation provided they come from the living trees.

5.3.5 CARBON CREDITS

In the section in a now superseded version of AASB 141 on incompatibilities between AASB 1037 and AASB141 it was noted that AASB 141 is narrower in focus and specifically excludes an “...investment in a forest as a carbon sink which gives rise to carbon credits that can either be sold or used to offset pollution caused by the entity”.

IFA /ACFA therefore believe that it is necessary to separate out the carbon credit component and treat it separately in the financial reports. In future, carbon credits will be valued by the market and may possibly be accounted for as a financial instrument.

Until a more definitive interpretation is available, it is recommended that the forest be valued on the basis of the expected cash flows, and reported with due recognition of the liabilities.

¹⁵ For example:

Australian Pine Log Price Index www.kpmg.com.au

Forest Products Commission, Western Australia www.fpc.wa.gov.au

Ministry of Agriculture and Forestry, New Zealand

www.maf.govt.nz/Forestry/statistics/logprices/logprices1.htm

5.4 DISCOUNTING

5.4.1 GUIDELINES

Cash flows:

- **should use the expected net cash flows over the specified planning horizon (generally not less than a full rotation and the transition to the next in the case of a sustainable going concern),**
- **include terminal value at the end of the rotation immediately following the conclusion of the planning horizon, and,**
- **base the terminal values on the forecast values at the relevant time or on Faustmann calculations of those values for an optimum regime.**

AASB 141 requires that pre-tax cash flows should be used but the example in an early now superseded Appendix A used a post-tax rate. The superseded AASB 1037 was equivocal on whether pre-tax or post-tax cash flows should be used. **Whichever basis is used for any forest valuation, the discount rate should always be consistent with the tax treatment of cash flows. ACFA believes that it is essential to disclose the basis and discount rate used.**

Depreciation charges are not relevant to valuation of the biological assets but are accounted for in the treatment of valuation of non-current Assets. The situation may be different in the case of less-formal valuations and appraisals, depending on the circumstances.

5.4.2 CHOICE OF DISCOUNT RATES

The choice of discount rate has traditionally been one of the most controversial elements in the valuation of forest estates and plantation estates because of the sensitivity of Present Value to the discount rate chosen. The search for one single rate to apply to all valuations is neither appropriate nor sensible. It depends on the viewpoint of whoever commissions the forest valuation.

... In these circumstances, an entity uses the present value of expected net cash flows from the asset discounted at a current market-determined pre-tax rate in determining fair value. [AASB 141:20]

The objective of a calculation of the present value of expected cash flows is to determine the fair value of a biological asset in its present location and condition. An entity considers this in determining an appropriate discount rate to be used in estimating net cash flows. ... [AASB 141:21]

The market-determined rate may vary with the risk characteristics of the particular class of entity. ACFA believes that valuations using post-tax discount rates are more appropriate for many purposes but the AASB 141 standard requires the valuation of biological assets to be based on the pre-tax rate.

5.4.3 DISCOUNT RATE CONSIDERATIONS

The opportunity cost of capital is the major conceptual element in the choice of discount rate because it represents a measure of the next best alternative use of the investment funds concerned. The individual entity needs to take account of the following.

- **The private market rate that is available.** In 2002, Japan had a private market (money) rate of less than 2%, compared with about 5% in Australia.
- **The length of the investment period (generally, but not always, the rotation length).** Short horizon investments such as blue gum pulpwood plantations will be geared more directly to private market rates. Very long planning horizon investments in wood



production in native forests may warrant lower effective interest rates for far distant revenues and expenses.¹⁶

- **The debt to equity ratio.** Investors who can avail themselves of substantial debt capital are potentially advantaged because interest charges are allowable expense against revenues, and thus may carry lower opportunity costs than equity capital for which dividends are not an allowable expense. Most discounting is based on a weighted average of the interest rate on debt and the rate for equity – each having a different risk loading. Alternatively, aspects of risk may be taken into account through insurance, or through specific stochastic modelling in the prediction of future wood flows, prices and costs.
- **The preference for net income flows over time.** Different investors have very different preferences for the time flows of income (and liquidity of investment) in the long run, as the earlier Japanese example highlights.

The important issues for the choice of discount rate in forest valuation are consistency over time and disclosure, such that the readers can adjust the outcome in the light of their own perceived discount rate.

ACFA recognises that wherever possible a market derived rate should be used, and recommends that market signals should also be considered.

ACFA recognises that the market based discount rates are seldom used for the long planning horizons commonly used in forest management and forest valuation. However the long discounting periods mitigates the effects on value.

ACFA would prefer that the discount rate used be a single market based rate, and not a built up rate, but notes that the longer term and risk implications of any selected single rate need to be considered.

ACFA recognises that for a [Director's Valuation](#) the discount rate used in any discounted cash flow analysis will be provided from within the organisation but this does not hold for an Independent Valuation where the forest valuer must determine the rate to be used. One way of determining the discount rate could be to use the Capital Asset Pricing Model (CAPM), see Definitions and Explanations. If reviewing a Director's Valuation, the forest valuer should assess the discount rate to determine whether it is considered acceptable or not.

5.4.4 NEGATIVE VALUES FOR SOME COMPONENT STANDS

When calculating the value for each and every stand in a forest estate, negative amounts may result from application of the Present Value model for some stands or components of stands. The computer-based models used to forecast expected wood flows at any given age generally deduct only the direct expenses involved from the resulting revenues. Indirect costs are then deducted from the resulting estimate of present value across the entire estate. There is a risk that some stands that contribute negatively to overall Present Value are being overlooked in this process and forest valuers need to engage in testing of these assumptions. There are, of course, good economic reasons for including some less productive areas in a particular stand if the discounted marginal revenues outweigh the discounted marginal cost. The concern is a more general one to ensure that substantive areas of low productivity are tested as to the highest and best use.

A particular region of a forest estate at the limit of suitability for a species may have a negative Present Value. This may also occur for a particular species distributed throughout a region on an unproductive but scattered soil type. If so, the financial report should acknowledge that the particular region is not being managed primarily for profit. The component stands should then be subject to an alternative valuation model that takes

¹⁶ Ferguson, I.S., 1996. *Sustainable Forest Management*. Oxford University Press, Melbourne, 162pp.



account of the non-commercial nature of the asset. The Present Value of that part of the biological asset should be set to zero for that particular region.

The treatment may depend in part on professional judgement. Whatever treatment is used it should be clearly documented and fully disclosed.

5.4.5 APPROPRIATE PLANNING HORIZON FOR SCHEDULING WOOD FLOWS AND FOR PRESENT VALUE

Where subsequent rotations result in additional contributions to Present Value and, even more so, where the harvest area is a small proportion of the total estate, in the manner typical of a sustainable forestry business, limiting the analysis of Present Value to the current Living Trees does not provide the best indicator of fair value in an active market. Large forest estates and plantation estates are typically managed to sustain wood flows over time. Scheduling wood flows based on the living trees alone for relatively short rotations (say, less than 40 years) results in either a declining wood flow over time, or a much reduced sustained wood flow, because no account is taken of replacement. This can lead to a material reduction in Present Value and is not consistent with providing the best indicator of fair value in an active market for a sustainable going concern.

If scheduling is extended to include future rotations, the treatment of terminal values needs to be addressed, if only to check whether they have a material effect. Two methods that are broadly equivalent can be used. The first is to employ the initial value of the land, or forecast of its future value at the time in question, as the terminal value. The other is to estimate a terminal value at the end of the rotation immediately following the end of the planning horizon to schedule wood flows, using a Faustmann approach of an infinite series of future rotations for each stand after clear-felling.

The appropriate choice of planning horizon and terminal values hinges on materiality. Subsequent rotations should be included, or terminal values for them computed and included, when they form part of sustainable business activity and may result in a material increase in Present Value. The issue of materiality will depend on the magnitude of the Present Value of the subsequent rotations, which can be readily evaluated.

5.4.6 VALUING A SUSTAINABLE GOING CONCERN

ACFA considers that in the case of an entity valuing its Living Trees as a sustainable going concern then post-tax is more likely to give an appropriate fair value relevant to the market place than pre-tax.

In essence ACFA believes that the taxation considerations should match those used to determine the value in the market, and hence the fair value.

As noted earlier, The Association of Consulting Foresters of Australia requires that any forest valuation report disclose the discount rate, its basis, and any other key assumptions.

Periodic changes in Australian Taxation Office treatment of funds raised by product disclosure statements or information memoranda for afforestation highlights the need for checking current rulings¹⁷.

In less-formal valuations (appraisals), either pre-tax or post-tax valuations may be appropriate. This depends on the use to which the valuation is to be put and the client can always superimpose the appropriate tax considerations.

¹⁷ See Australian Taxation Office website www.ato.gov.au and Australian Forest Growers website www.afg.asn.au.

5.4.7 SENSITIVITY ANALYSIS

Most clients require that appropriate steps be taken to evaluate the financial as well as the biological and physical risks attached to forests and plantations that are the subject of reporting, transactions, or management review.

Sensitivity analyses are not required under AASB 141 but ACFA believes their use is essential.

The most common form of evaluation is carried out by sensitivity analysis. This involves testing the sensitivity of the estimated Present Value to variations of (say) $\pm 10\%$ in key variables, taken one at a time.

More complex methods involve incorporation of the probability distributions attached to all uncertain variables and then estimating the expected value of Present Value by a Monte Carlo simulation approach, using specially developed programs. If such analyses focus on only two or three of the sources of risk, they add little, if anything, to a sensitivity analysis. On the other hand, a fully stochastic analysis may be too expensive and time consuming, even if limited to the final spreadsheet schedule.

5.4.8 REPORTING CHANGEOVER TIME

The assumptions and models underlying forest valuation may vary over time as the forest and the systems evolve. Year on year comparisons will normally reflect gradual changes but there may be significant changes that need to be explained.

Sensitivity analysis can be used to prepare forest valuations using alternative assumptions and so facilitate these year on year comparisons. For example, changes to interest rates, silvicultural models, or catastrophic changes to the forest estate, or major improvements to inventory of models, may become material and it is recommended that the new valuation be reported together with sensitivity analyses showing the effect of each of these material changes that have occurred since the last valuation.

The definition of material change will depend on the circumstances but it could be 5-10% of the valuation. This would parallel the tenor of AASB advice on materiality.

6. FOREST INVENTORY AND YIELD ESTIMATION

This section provides the information about the forest necessary to determine the forest valuation.

6.1 FOREST INVENTORY

6.1.1 CHECK LEGAL BASIS OF OWNERSHIP AND RIGHTS

Valuations of the land on which forests or plantations are grown need to be based on a secure knowledge of the legal basis of ownership.

Appropriate checks on the location and condition of and assets on that land need to be carried out as an initial part of valuation of the forest or plantation.

A valuation report should declare or disclose the following;

- **the legal basis of the property rights to the biological assets (ie the living trees) and the land,**
- **the boundaries and areas of land involved,**
- **the boundaries and net effective areas of plantation or forest by age class or structural classes, site productivity, stocking, and condition,**
- **the sources of area data, maps, and methods used to develop the area statements, and,**
- **a statement as to the reliability of the area estimates.**

Ownership can be established through inspection of the legal title, available from the respective State Land or Title Registries. Note should be taken of any rights of neighbours, covenants, encumbrances, or easements thereon. Most States have special legislation relating to Forestry Rights that enable the biological asset to be separated legally from the land, without necessarily requiring registration of that assignment of ownership on the title. Under these conditions, written assurance should be sought from the registered owner of the ownership status of the Living Trees. Separate or related rights may, in some States, extended to Carbon Rights and global warming issues.

6.1.2 CHECK BOUNDARIES AND NET EFFECTIVE AREAS

Global Positioning Systems (GPS) are now widely available and are invaluable in checking boundaries.

Locations specified on titles should be checked against [GPS measurements](#) or other precise measurements on the ground. Geographic Information Systems, aerial photography or rectified satellite images should also be used to check the title boundaries and those of the planted areas and the location of other assets and land uses.

In the case of larger estates which have well-established and documented databases or land registries, sample surveys using GPS may suffice to check additions to the database, provided periodic full audits have been carried out.

The identification and mapping of net effective areas of forest or plantation is vital as it distinguishes those areas from others which are either carrying no trees or whose trees are or will be, when mature, of such low aggregate volume, average stem size, or quality as to be uneconomic to harvest.

Any report should include full details of the description of the land, its characteristics and climate, and any other matters that affect its potential commercial yields.

6.1.3 FOREST INVENTORY

The process for assessing the merchantable volumes of living trees in any substantial forest estate is complex. Forest inventory is unlike other spheres of manufacturing or agriculture inventory.

Objective sampling methods should be employed for forest inventory. These include stratified random, systematic sampling or random sampling and may entail multi-stage or double sampling. Stratification is commonly provided from interpretation of aerial photography of 1:25,000 or better scale. The intensity of sampling can be varied in stratified random sampling to provide better [precision](#) for a given number of plots.

Where objective methods are not used the methodology used must be fully described, justified and documented.

Private Forests Tasmania provides a *Farm Forestry Toolbox*¹⁸ on CD that contains useful guidance and assistance for property survey, tree volume measurement, inventory, estimation of costs and revenues, and for calculating the Net Present Value of a single rotation for small woodlots. These include eucalypt pulpwood, pine and eucalypt sawlog, and mallee oil rotations. Reid and Stephen¹⁹ and Abed and Stephens²⁰ provide examples of designs of a simple forest inventory for small woodlots. Schreuder *et al*²¹ deals with the details of design for larger estates.

The basic information should generally include recording of species, tree diameter overbark at [Breast Height](#) (dbhob), tree height on all or a sample of trees in the plot in order to estimate upper stand height, and bole height in the case of hardwoods.

Most owners of medium and large forest estates have established inventory procedures. The responsibility of the consultant is then to verify the precision and freedom from bias of that inventory, so that a statement of the reliability of the base information regarding Living Trees can be made. Where there are material defects in the reliability, these should be made clear and any further statements in relation to the value of the biological asset should be appropriately qualified.

6.1.4 GUIDELINES FOR INVENTORY PRECISION AND BIAS

Accuracy of the inventory should be gauged through estimates of precision and bias. The appropriate level of accuracy will depend on the client's instructions and the standards prescribed or appropriate for appraisals or independent valuations or audits.

Whether valued from transactions data or by Net Present Value, the volume of the biological asset on the estate is the dominant resource element in determining the magnitude of the value. As a guideline ACFA considers that in general, a [sampling error](#) of no more than ± 5 to 10% at the 95 % probability level would be considered adequate for an intensively managed forest. For intensively managed plantations, the sampling error might be less than 5%. Larger values (with expected poorer precision) might be acceptable for less intensively managed forests and some plantations. Where yield control is tight and forests intensively managed, the criterion for precision may be stipulated for sub-units of the estate (such as individual logging units or coupes), due to their importance in scheduling

¹⁸ Details and updates of the Private Forests Tasmania *Farm Forestry Toolbox* are provided on www.privateforests.tas.gov.au.

¹⁹ Reid, R. and Stephen, P. 2001. *The Farmer's Forest: Multipurpose Forestry for Australian Farmers*. Australian Master Tree Grower, Parkville, 167 pp.

²⁰ Abed, T. and Stephens, N.C. 2003. *Tree Measurement Manual for Farm Foresters*. 2nd edition, edited M.Parsons, National Forest Inventory, Bureau of Rural Sciences, Canberra, Australia, 80pp.

²¹ Schreuder, H.T., Gregoire, T.G. and Wood, G.B. 1993. *Sampling Methods for Multiresource Forest Inventory*. J Wiley, New York, 446 pp.



the future pattern of harvesting geographically, temporally and for particular log assortments.

It should also be recognised that the precision of yield predictions will generally vary depending on the age class distribution and the state of the forest.

Material bias for an intensively managed forest or plantation would normally mean a bias (relative to actual) of more than 10%. Although not stated formally, most accounting practitioners tend to minimise the risk of a material discrepancy, such that if they err, it is towards an underestimate, not an overestimate. However ACFA believe that it is undesirable to simply adopt a conservative approach without justifying the reasons for each case. The sampling error may be far higher for sub-populations (for example a particular species or a range of size classes) and care should be taken in interpreting such information. Care is also needed in analysing inventories where some plots have zero values for the component of interest as statistical assumptions may be violated.

ACFA recognises that forest inventory and yield forecasting may be complex issues requiring specialised expertise and considerable experience if errors and misinterpretations are not to occur.

6.1.5 RECORDING SHEETS: DESIGN AND RETENTION

The measurements taken on plots vary widely according to local standards and species requirements. **Recording sheets (or hand-held computer templates for data entry and storage) should be well designed and standardised and the data obtained stored in a secure form and place, in case they are needed later, for example in legal actions or in discussions with clients.**

A suitable recording sheet for simple inventories may be found in the *Farm Forestry Toolbox*²². However, experience of ACFA members in court cases indicates that consultants must not only be able to document the process undertaken, they may be called on to justify it. Hence more complex forms of sampling, such as variable radius plots and centroid and importance sampling need to be well understood if they are to be used.

6.1.6 STAND HISTORY

Details of stand history should be sought and recorded.

Wherever possible, the following characteristics or treatments should be sought and recorded;

- species
- seed/genetic source
- year of establishment or regeneration treatment
- initial stocking
- fertiliser and weedicide treatments
- prunings – age, numbers/ha, height
- thinnings – age, intensity, method
- insect and disease attacks and treatments, and
- growth, mortality and removals.

The purpose of recording stand history is to facilitate more precise and less biased estimates of both the current inventory of the biological asset and of the future development of those trees under the scheduled regimes. The extent of the information

²² Private Forests Tasmania, Farm Forestry Toolbox, www.privateforests.tas.gov.au



recorded will therefore normally hinge on the capacity of the forecasting system or yield functions or tables to use this information.

6.1.7 DECLARE RELIANCE

As with other data, it is important to declare what reliance has been placed on data or information provided by other parties.

6.2 YIELD ESTIMATION

6.2.1 CHECK GROWTH, MORTALITY, YIELD FUNCTIONS

A systematic check of growth, mortality and yield functions applicable to the forest or plantation should be carried out and the sources of information used should be recorded.

Some organisations²³ maintain detailed systems for recording yield functions or tables and relevant information for this purpose. The sources of these data and any adjustments or allowances to them need to be recorded in the report.

For larger forest estates, scheduling of wood flows forms a necessary prelude to the estimation of Present Value. In these forests, sampling is seldom repeated each year on the same individual block. Rather, sampling of blocks is carried out on a periodic basis using a cycle of three to ten years to cover a large estate.

Older samples therefore need to be updated for growth, mortality, treatment (for example later age fertilising) and thinning or clear felling during the intervening period before they can be aggregated with those of the current year to produce estimates of the current volumes of the biological asset. Having brought all predictions in the estate to the current date, future wood flows over time then have to be predicted using the same or appropriately modified functions.

Growth, mortality and yield functions are also needed to forecast future wood flows from the current inventory of living trees. Most consultants rely on publications and computer-based models by reputable scientists for these data or functions, adjusting where necessary. They should also satisfy themselves of the scientific basis for any revised functions that incorporate the predicted outcomes of new technologies. This involves professional judgement (and reporting) as to the evidence for such changes and the magnitude of them.

Forecasting wood flows for medium and large estates implies matching the wood flows to the likely market demands. The latter are normally determined firstly from any long-term supply contracts, together with an assessment of regional and general trends in demand. For large estates, scheduling by linear programming, simulation or spreadsheet, is normally carried out to establish the best match between the demands and the capacity of the forest to supply.

The basis used to predict future wood flows needs to be discussed and documented.

²³ For example:

Lewis, N.B., Keeves, A. and Leech, J.W. 1976. Yield regulation in South Australian *Pinus radiata* plantations. Woods and Forests Dept., South Australia, Bulletin 23.

Private Forests Tasmania, Farm Forestry Toolbox, www.privateforests.tas.gov.au,

Borschman, R., 1998. Plantation productivity potential of blue gum and radiata pine for North East Victoria. Plantations North-East Inc, Wodonga, 22pp.

7. DISCLOSURE

7.1 GUIDING PRINCIPLES

The guiding principles reported in the AASB's "Framework for the Preparation and Presentation of Financial Statements"²⁴ provide useful guidelines for the prospective valuer and are summarised here.

Relevance. To be relevant, financial information must have value in terms of assisting users in making and evaluating decisions about the allocation of resources and in assessing the rendering of accountability by preparers of financial statements.

Reliability. Financial statements should faithfully represent a sufficiently precise (without undue error) and valid (without bias) view of transactions and events. The risk of undue error can, in some cases, be offset by prudent disclosure of the uncertainties surrounding the information. Conservatism may be an acceptable synonym for reliability where it relates to the assessment of probabilities and exercise of professional judgement but not simply as arbitrary position against risk.

Materiality. The test of materiality follows the determination of relevance and reliability. It is concerned with testing whether omission, misstatement or non-disclosure could affect decision-making about the allocation of scarce resources by users of the financial information.

Understandability. Statements should be understandable in basic commonsense, legal and accounting terms such as to provide sufficient disclosure for a reasonable person to avoid the potential for misunderstanding.

Faithful representation. To be reliable, information must represent faithfully the transactions and other events it either purports to represent or could reasonably be expected to represent.

Substance over form. It is necessary that reports are presented in accordance with their substance and economic reality and not merely their legal form.

Neutrality. Financial information must be presented free of bias.

Prudence. The preparers of financial reports have to contend with the uncertainties that inevitably surround many events and circumstances. Such uncertainties are recognised by the disclosure of their nature and extent and by the exercise of prudence in the preparation of the financial report. Prudence is the inclusion of a degree of caution in the exercise of the judgements needed in making the estimates required.

Completeness. To be reliable, the information in financial reports must be complete within the bounds of materiality and cost.

Timeliness. Statements should be available to persons having a reasonable right to them as soon as possible after the end of the period to which they refer.

Balance between benefit and cost. This is commonly a constraint to a valuation.

Balance between qualitative characteristics. In practice the aim is to achieve a balance, or trade-off, between qualitative characteristics.

7.2 DISCLOSURE OF BIOLOGICAL ASSETS

ACFA considers that the information disclosed should be readily interpreted and should be consistent with common reporting of forest inventory.

²⁴ AASB Framework *op.cit.*

If not disclosed elsewhere in information published with the financial report, an entity shall describe:

- (a) the nature of its activities involving each group of biological assets; and*
- (b) non-financial measures or estimates of the physical quantities of:

 - (i) each group of the entity's biological assets at the end of the period; and*
 - (ii) output of agricultural produce during the period. [AASB 141:46]**

An entity shall disclose the methods and significant assumptions applied in determining the fair value of each group of agricultural produce at the point of harvest and each group of biological assets. [AASB 141:47]

An entity shall disclose the fair value less costs to sell of agricultural produce harvested during the period, determined at the point of harvest. [AASB 141:48]

An entity shall disclose:

- (a) the existence and carrying amounts of biological assets whose title is restricted, and the carrying amounts of biological assets pledged as security for liabilities;*
- (b) the amount of commitments for the development or acquisition of biological assets; and*
- (c) financial risk management strategies related to agricultural activity. [AASB 141:49]*

An entity shall present a reconciliation of changes in the carrying amount of biological assets between the beginning and the end of the current period. The reconciliation shall include:

- (a) the gain or loss arising from changes in fair value less estimated point-of-sale costs;*
- (b) increases due to purchases;*
- (c) decreases attributable to sales and biological assets classified as held for sale (or included in a disposal group that is classified as held for sale) in accordance with AASB 5;*
- (d) decreases due to harvest;*
- (e) increases resulting from business combinations;*
- (f) net exchange differences arising on the translation of the financial report into a different presentation currency, and on the translation of a foreign operation into the presentation currency of the reporting entity; and*
- (g) other changes. [AASB 141:50]*

7.3 DISCLOSURE OF LAND AND BUILDINGS, ACCOUNTED FOR IN TERMS OF AASB 116

The disclosure requirements in respect of land and buildings, accounted for as property, plant and equipment under AASB 116, are outlined in AASB 116 paragraphs 73 to 79. The first part of paragraph 77 is quoted below, due to its importance for valuers.

If items of property, plant and equipment are stated at revalued amounts, the following shall be disclosed:

- (a) the effective date of the revaluation;*
- (b) whether an independent valuer was involved;*
- (c) the methods and significant assumptions applied in estimating the items' fair values;*

- (d) *the extent to which the items' fair values were determined directly by reference to observable prices in an active market or recent market transactions on arm's length terms or were estimated using other valuation techniques; [AASB 116:77]*

7.4 DISCLOSURE OF LAND AND BUILDINGS, ACCOUNTED FOR IN TERMS OF AASB 140

The disclosure requirements in respect of land and buildings, accounted for as investment property in terms of AASB 140, are outlined in AASB 140 paragraphs 74 to 79. An extract of AASB 140 paragraph 75 is quoted below, due to its importance for forest valuers.

An entity shall disclose:

- (d) *the methods and significant assumptions applied in determining the fair value of investment property, including a statement whether the determination of fair value was supported by market evidence or was more heavily based on other factors (which the entity shall disclose) because of the nature of the property and lack of comparable market data;*
- (e) *the extent to which the fair value of investment property (as measured or disclosed in the financial report) is based on a valuation by an independent valuer who holds a recognised and relevant professional qualification and has recent experience in the location and category of the investment property being valued. If there has been no such valuation, that fact shall be disclosed; [AASB 140:75]*

7.5 IMPORTANCE OF DISCLOSURE

Where there is uncertainty that calls for professional judgement, disclosure is important, whether it be by way of reference to other published data or predictions as a basis for judgement, or to an explicit recognition of a subjective and perhaps conservative judgement in the interests of reliability.

Disclosure in the public domain may be fraught with difficulties regarding the specifics where commercial-in-confidence data are involved, but the consultant's report can accommodate this through a confidential appendix containing details, and a general description of the matter (and any appendix) in the main text.

7.6 CONSISTENCY OF REPORTING

In a large forest entity reporting under AASB 141 it is important all aspects of the information reported in any financial reports are consistent.

7.7 CHECK STANDARDS FOR CHANGE

Standards and guidelines have and will continue to change and improve, partly because of public demands and partly as a result of the increase in knowledge. The best templates to follow for a major valuation may well be those of similar recent exercises in the public domain, as these can be expected to evolve. The possibility of changes to the underpinning accounting standards also needs to be considered. There is always scope to improve on past valuations, if only from the wisdom of hindsight.

Forest valuers need to consider the possibility of change and not just adopt the methodology that was appropriate at an earlier time.

8. REVIEW OF STANDARD

8.1 CHECK STANDARDS FOR CHANGE

Standards and guidelines have and will continue to change and improve, partly because of public demands and partly as a result of the increase in knowledge.

ACFA plan to continue to review the various accounting and other relevant standards in order to ensure the ongoing appropriateness and relevance of this standard.

In 2007 ACFA became a Division of the Institute of Foresters of Australia although it retains a separate status.

8.2 REVIEW AND MAINTENANCE OF THIS STANDARD

ACFA have established a subcommittee charged with the ongoing enhancement and maintenance of this standard.

The sub-committee will comprise the Chairman of the ACFA Division of the Institute of Foresters of Australia as Chairman, a Coordinator, and up to three members.

The procedure for adopting any changes will be as follows.

- The sub-committee will discuss and agree on proposed changes, consulting as widely as they deem appropriate.
- The proposed changes will be forwarded to the Executive Committee of ACFA, the IFA Board of Directors and any interested parties for further discussion and comment.
- If necessary the sub-committee will modify the proposed changes.
- These proposed changes will be circulated to all ACFA members for comment unless they are minor editorial or formatting changes.
- Comments will be considered, but under the constitution it is the Executive Committee of the ACFA Division which has the responsibility of approving any changes. If the changes are considered by the Executive Committee to be of such moment or importance then the Executive Committee may deem it appropriate that the proposed changes be put to a General Meeting of ACFA.

When the Executive Committee has approved the proposed changes that version will be placed on the ACFA section of the IFA website and all members will be informed of its replacement by the Chief Executive Officer of IFA.

DEFINITIONS AND EXPLANATIONS

SGARA

A SGARA (self-generating and regenerating asset) is a non-human living asset and is intended to apply to all living assets, regardless of the production cycle, or how they were created. Produce from a SGARA that continues to undergo change after extraction from a SGARA (for example wine) is not a SGARA because it does not undergo biological change²⁵. This term was defined in AASB 1037 which has been superseded by AASB 141. The current standard uses the term “biological assets” but the treatment is in essence the same. The term is expected to become increasingly redundant over time.

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LIVING TREES

Living trees are those that are biologically alive, whether standing, prostrate, or with broken boles. This is a new term to replace the traditional ‘standing crop’ or ‘standing trees’ whose meanings no longer conform precisely to the SGARA definition or the definition of biological assets. The term is expected to become redundant over time.

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NON-LIVING PRODUCE

Non-living produce represents the potentially commercially saleable produce derived from a biological asset but is not in itself a biological asset because it is not living. In the case of forests this includes, logs, pulpwood, firewood, turpentine, ungerminated seed, severed foliage and floral parts. The term is expected to become redundant over time.

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NON-CURRENT ASSET

A non-current Asset is a future economic benefit controlled by the entity as a result of past transactions or other past events which, in the ordinary course of business, would not be consumed or converted into cash, or would be due or payable, within twelve months of the end of the financial year to which the financial report relates or reporting date involved. A non-current Asset is not a biological asset (or SGARA) according to the interpretation AASB 141.

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PRESENT VALUE

The Present Value of a forest or plantation is the aggregate value of the future stream of expected net revenues, when appropriately discounted to the end of the financial year concerned or other stipulated reporting date. For forest valuations, the stream of future net revenues is normally extended to infinity (the Faustmann²⁶ approach) or to a particular point in time such as the end of the first or second rotation and a terminal value attributed to the land and forest at that point.

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²⁵ Parker, C. (ed.), 2001. *Accounting Handbook 2001*. Volume 1. Prentice Hall, Sydney, 1453 pp. See AASB 1037: 10.1

²⁶ Faustmann, M., 1995 [1849]. On the determination of the value which forest land and immature stands pose for forestry. Trans. W. Linnard), *Journal of Forest Economics*, **1**(1). 7-44.

'MONEY' AND 'REAL' VALUES

Money dollar values (m_t) in year t can be converted to real dollar values (r_t) in year t by multiplying it by the ratio of the price index in the base year (P_b) to the price index in year t (P_t) (or the inverse expression for real to money values):

$$r_t = m_t (P_b/P_t)$$

Suitable series for the Australian Consumer Price index may be found at:

www.aasb.gov.au and search for "consumer price index"

If all rates are expressed as decimals, real rates of interest or discount rates (i_r) can be calculated from money rates of interest or discount rates (i_m) by adjusting for the rate of inflation (i_i) as follows:

$$(1 + i_r) = (1 + i_m) / (1 + i_i)$$

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GPS MEASUREMENTS

Global Positioning Systems (GPS) now represent the recommended method of measurement of land and forest boundaries because of speed of use and accuracy.

Many explanations on good practice using GPS are available, including the property, titles and maps section of the website www.dse.vic.gov.au.

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FOREST INVENTORY

Forest inventories differ from most other inventories.

1. The products (logs in a living tree) and the processing plant (the living tree) are virtually indistinguishable.
2. The capacity of the processing plant (the future rates of production of various log classes) varies according to the present rate of production (rates at which log volumes are harvested). A forest or plantation estate that is heavily cut may suffer a marked reduction in future growth. One lightly cut may produce an increase in future growth. This inter-relationship between harvest and future growth is especially troublesome, given the inability to distinguish between processing plant and product.
3. The processing plant is very variable in constitution and may be spread over thousands of hectares. Even-aged forest stands and plantations arise from regeneration or planting in the same year. A forest or plantation estate may contain age classes from zero to perhaps 50 years, or much more in the case of native forest. Each age class is mostly independent of its neighbours except for the influence of exogenous factors such as fire, disease or the economies of treatment. In uneven-aged forest, trees of vastly differing ages and size exist on the one area of land and competition between neighbours may be intense. The processing plant may be variable due to variation in soils, and hence site productivity, or due to local hazards such as lightning strikes or hail.
4. Differences in silvicultural or harvesting practices can lead to differences in the log yields or qualities of particular sizes from otherwise identical stands. Genetically and environmentally-caused variations in tree form may be such that trees of the same dimensions at the base yield different volumes of particular log sizes or qualities.
5. Many different products in terms of log sizes and/or qualities are produced from large commercial plantations. As many as twenty may be separated either in the forest or in



the input line of the processing facility. Markets for these products can change markedly over extended periods of time, some disappearing and new ones emerging.

Such product variability on a spatial and temporal basis demands the use of demonstrably objective estimation of the volumes of living trees. However, this would present a prohibitively expensive task if each tree had to be measured and hence the use of objective sampling.

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PRECISION

Precision refers to the dispersion of measured or estimated values around the true mean under repeated sampling. In forest inventory, it is generally measured by the sampling error at the 95% probability level.

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SAMPLING ERROR

The sampling error is the standard error (i.e. the square root of the sample variance around its mean) times the value of the Student 't' statistic at the given probability level.

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BIAS

Bias refers to the difference between the estimated sample mean (i.e. the Expected Value of the sample) and the true value of the statistic under review.

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BREAST HEIGHT

Breast height is defined as 1.3m above ground level on the high side of the tree in Australia (1.4m in New Zealand).

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ACCRUAL ACCOUNTING

Accrual accounting involves recognition of revenues and expenses (and assets, liabilities and equity) in the financial year in which they occur, irrespective of when cash has been received or paid.

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JOINT COSTS

Where the costs of supply of a particular good are not independent of the supply of other goods and services²⁷, substantial economies may accrue such that the aggregate cost across all uses is substantially less than the sum from supplying those uses individually and separately. Land is an example of a major and critical input that is used in the production of all of the multiple uses of forests. This means that if the same quantities of the various uses were to be supplied independently from separate areas of land, the aggregate cost is likely to be well in excess of that from multiple uses.

Wood and non-wood uses alike will be more economic under such an allocation than they would have under single use management. The spreading of costs is of benefit to all uses

²⁷ Hof, J.G., Lee, R.D., Dyer, A.A. and B.M. Kent, 1985. An analysis of joint costs in a managed forest ecosystem. *Journal of Environmental Economics and Management* 12:238-52.



concerned, since it makes all more economic and thus justifies more investment in all. As is well known, there are countervailing propensities in relation to the provision of public consumption goods from forests, of which conservation and some aspects of recreation are examples, which lead to under-investment in these non-commercial services.

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LOG PRICES

One of the most vexing issues in valuation is the basis for predicting what prices will hold for wood in the future. Most analyses will have a planning horizon of at least 30 and generally of 50 years or more. There are therefore two characteristics to be determined - the immediate levels of real prices based on the current business cycle, and the secular trend, if any.

The Forestry Commission of Great Britain²⁸ at one time applied the prices pertaining to the current year to the entire forecast period. This rendered the balance sheet liable to major and erratic changes from year to year and hence is no longer used.

A moving average of past real prices over an entire business cycle in pulp and paper or sawn timber can be used to dampen such fluctuations by using the moving average value for the current year, in place of the current price. However, it would have to embrace 3 to 7 years and the secular trend component within that time may then be substantial.

Carrying the predictions from such a moving average or cyclical model forward and applying them to future prices is not recommended in view of the notable imprecision of these models.

Most practitioners first establish a set of real prices that reflect a secular average rather than spot level for the initial year or two and then apply a simple secular trend function to it to predict future prices.

The choice of immediate real prices and price trends are matters of professional judgement, not accounting standards. There is no universally correct method of predicting prices or the entrepreneur discovering it would have taken over the world of business long ago. It is up to the client, reader or auditor to determine whether the approach taken represents a reasonable assumption, under the circumstances. For this reason, disclosure of the methods used to predict future prices is essential.

The fact that the outcomes of the successive valuations of SGARAs shows up directly in the profit and loss statement provides a strong incentive to be unbiased and as precise as possible, especially in the immediate future, if unwelcome surprises in successive valuations are to be avoided.

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DISCOUNT RATES

ACFA recognizes that for a Director's Valuation the discount rate used in any discounted cash flow analysis will be provided from within the organisation but this does not hold for an Independent Valuation where the valuer must determine the rate to be used.

One way of determining the discount rate could be to use the Capital Asset Pricing Model (CAPM). In the simple CAPM²⁹, the discount rate for equity capital (RCAPM) is calculated as follows:

²⁸ Ferguson, I.S. and K. Houghton, 1996. *Valuation of Forest Assets*. Special Audit Report, Auditor-General, South Australia, Adelaide, 45 pp.

²⁹ Brealey, R., Myers, S., Partington, G. and D Robinson, 2000. *Principles of Corporate Finance*. McGraw-Hill, Sydney, 1122 pp.



$$RCAPM = R_f + \beta [E(R_m) - R_f]$$

where

RCAPM denotes the opportunity cost of capital

R_f denotes the risk free rate of return

β denotes the systematic risk of the equity

$E(R_m)$ denotes the expected rate of return on the overall market portfolio.

The risk free rate of return has generally been measured from the 10-year United States Treasury bond rate (because it is accepted as the most stable rate). This was generally in the range 4 to 5% in the decade prior to the Global Financial Crisis but as at 2011 was significantly lower. All rates cited here are in money values.

The values of β vary for different industries and major entities³⁰, from about 0.3 to 2.0. Those for major forest products companies are generally in the range 0.7 to 1.3.

Various studies of the risk premium $[E(R_m) - R_f]$ place it in the range of 3.5 to 5.0% for the decade to 2000. That range signals the difficulty of arriving at an appropriate risk premium for the Australasian forest-growing industry, especially given the subsequent turbulence created by the Global Financial Crisis and the ongoing financial issues. While forest valuers are generally required to provide a point estimate of forest value based on their best estimate of the risk premium and other factors, the uncertainty attached to the risk premium makes sensitivity testing or stochastic simulations highly desirable.

Inflation has recently been in the vicinity of 2-3% in Australia. Hence, the real values of the opportunity cost of capital used by major forestry investors are generally in the realm 7 to 9%. A small informal survey of some 10-15 members of ACFA provided a general range from 6 to 8%. This is supported by a small informal survey of other IFA members.

There are alternative, more complicated formulae that may be more appropriate than the one above, or may be mandated for use in certain circumstances. It is important that whatever methodology is used it must be clearly documented.

It may also be appropriate to analyse the Weighted Average Cost of Capital for listed forestry or other relevant companies as a guide.

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INDEPENDENT VALUATION

An independent valuation is defined as a valuation made by a firm which is an expert in relation to valuations of that type of asset and whose pecuniary or other interests could not be regarded as affecting the firm's ability to give an unbiased valuation.

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DIRECTOR'S VALUATION

A directors' valuation is a valuation which is not an independent valuation.

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³⁰ McKinsey & Co, Inc., Copeland, T., Koller, T., and J. Murrin, 2000. *Measuring and Managing the Value of Companies*. J Wiley, New York, 493 pp.