

'Exchange-Value' Accounting for Ecosystem Services

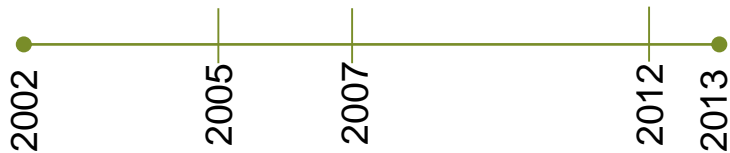
Mark Eigenraam

14 November 2013, Prepared for London Group on Environmental Accounting

19th Meeting, London



A brief history...



Vegetation policy -
“Net Gain”



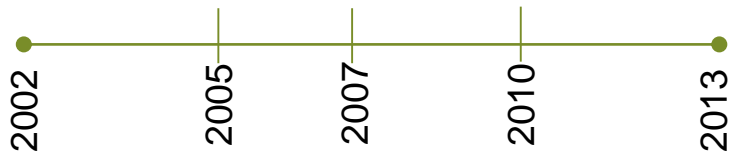
OFFSETS

- Native Vegetation Credit Register
- BushBroker

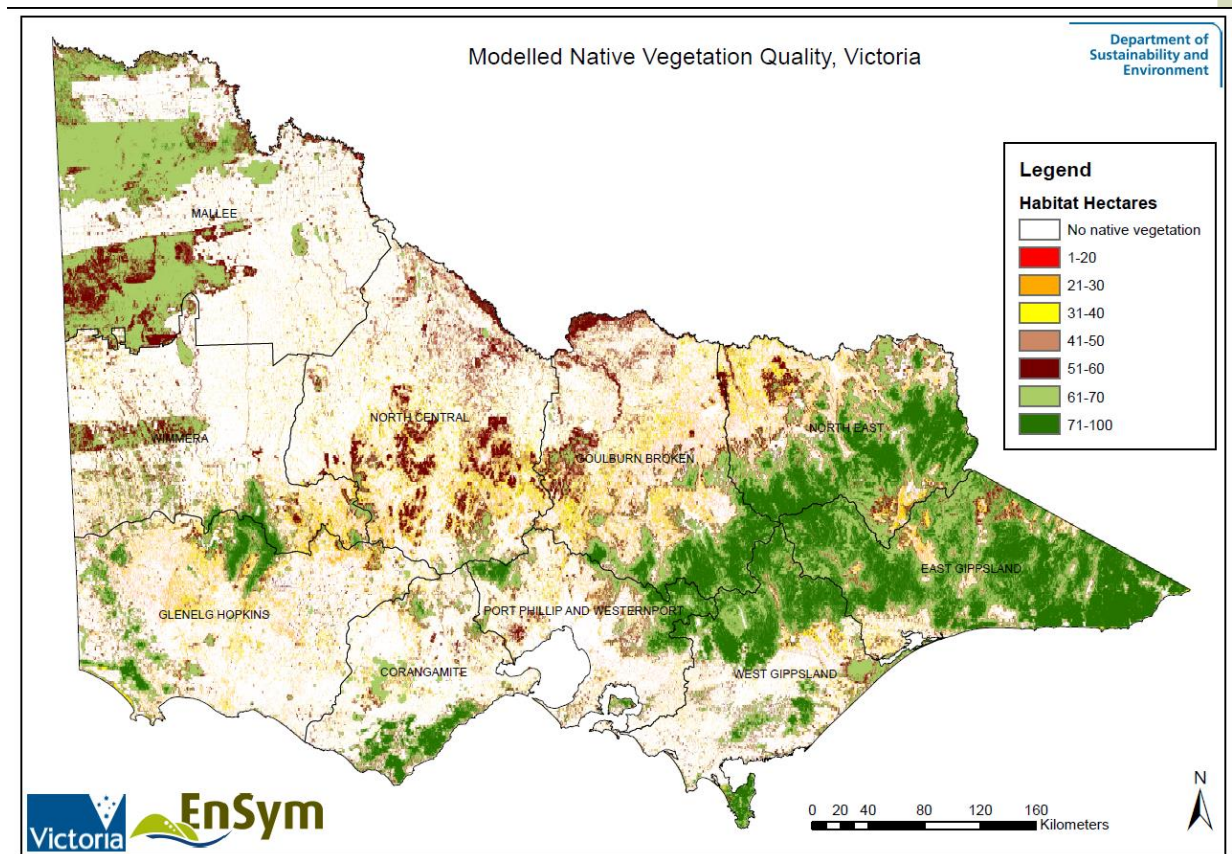
INVESTMENT

- BushTender

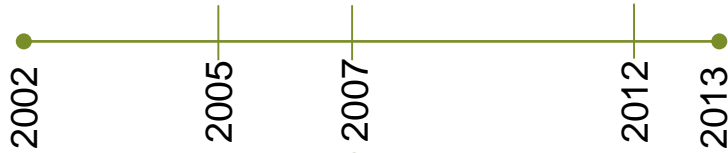
A brief history...



Vegetation type,
extent and condition
mapping



A brief history...

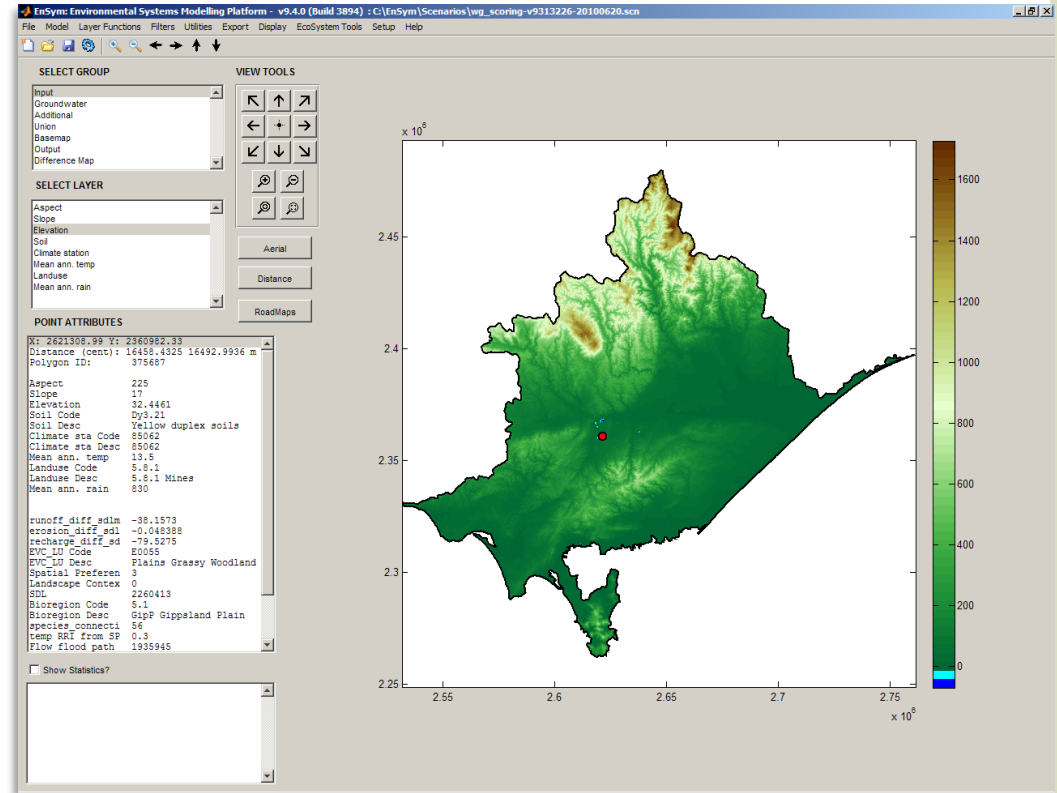


ecoMarkets

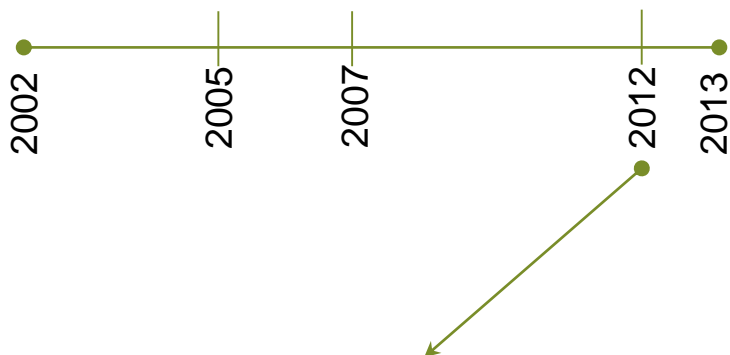
- Payments for multiple ecosystem services

EnSym

- Environmental modelling

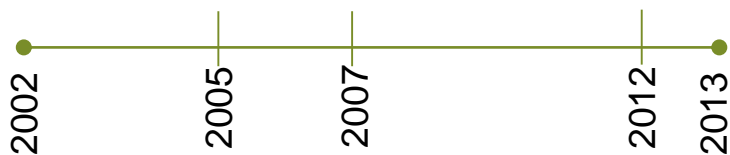


More recently...

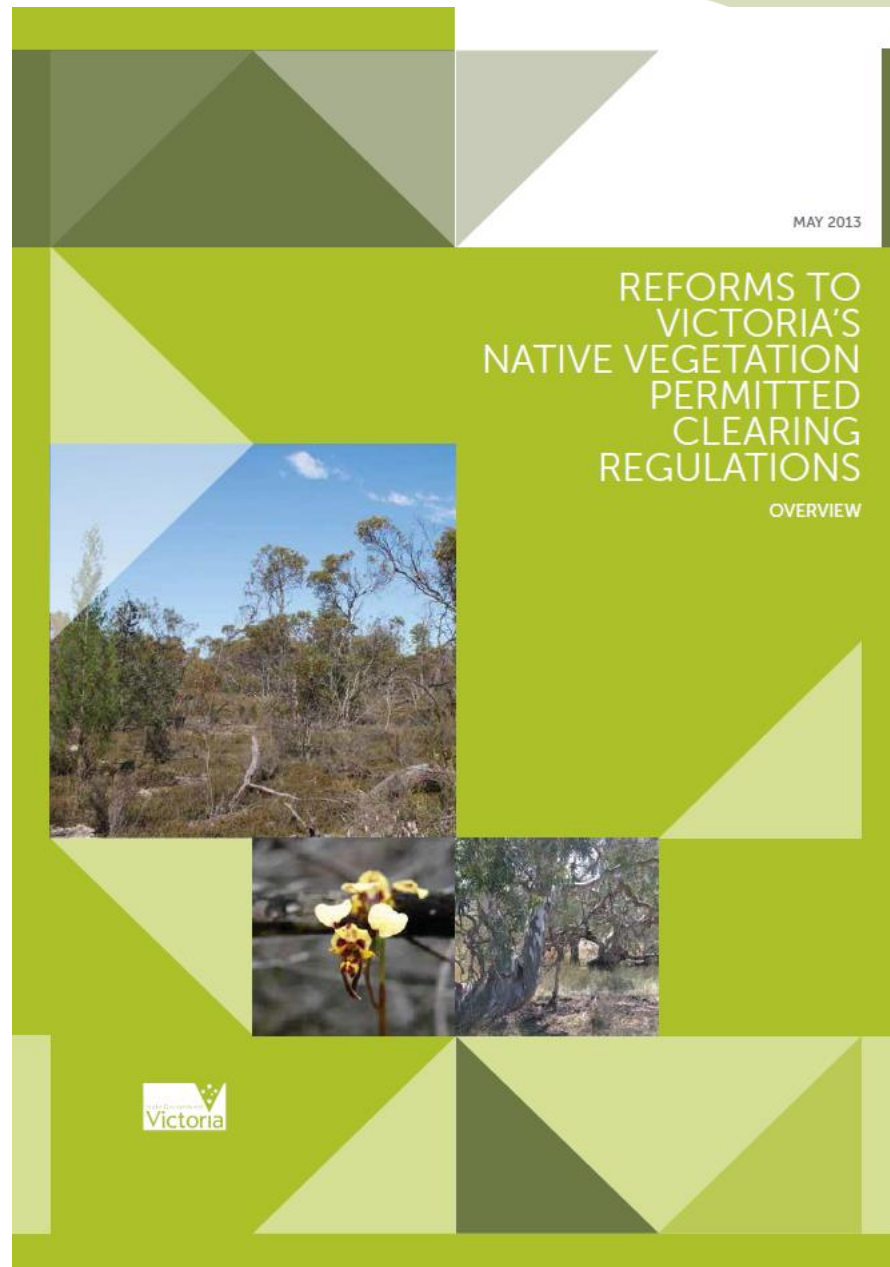
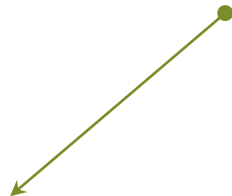


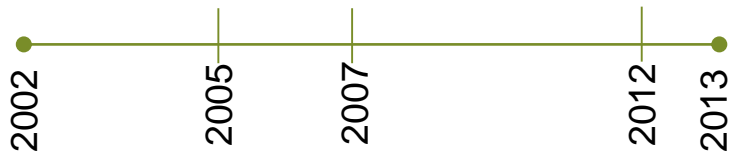
Victorian
Environmental
Partnerships





Offset reform

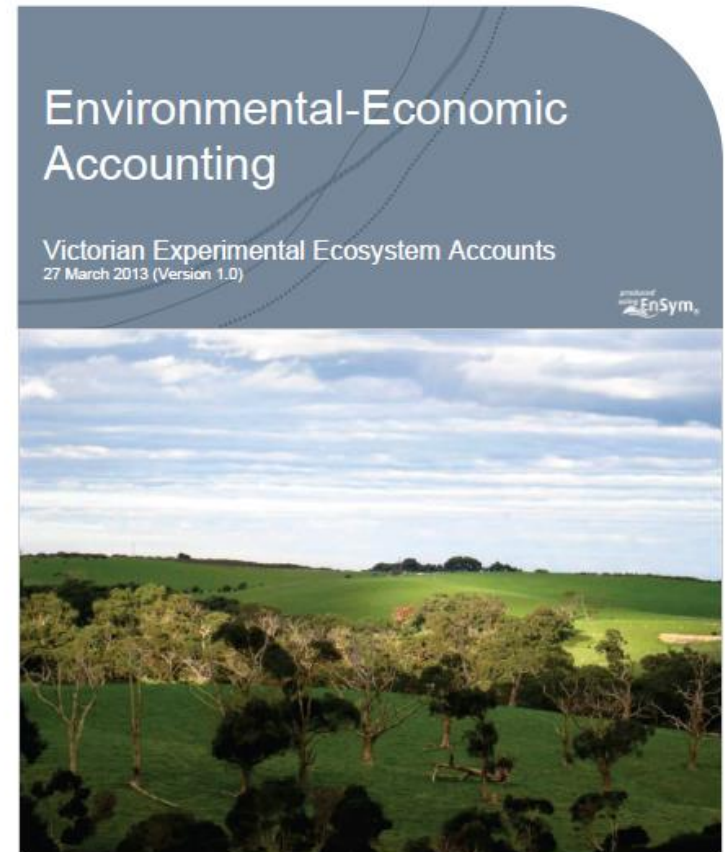




Victorian Experimental-Ecosystem Accounts

*“establish internationally recognisable environmental accounts that **improve the way we allocate resources**”*

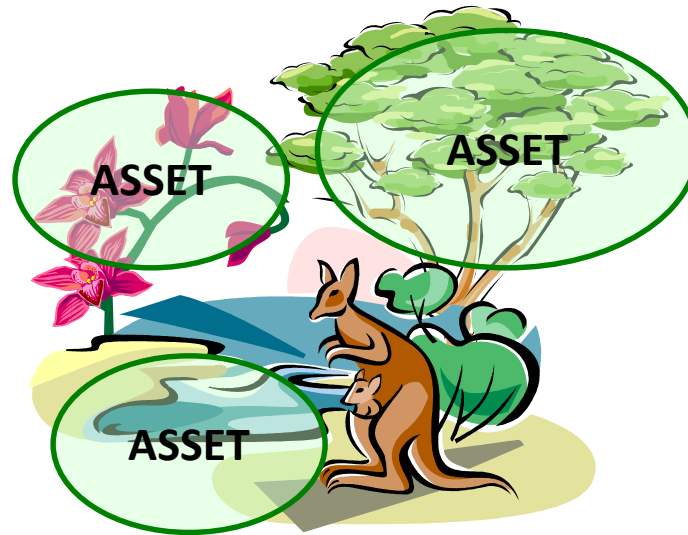
(Environmental Partnerships: Priority 8, 2012)



Current context

- What does it mean for business, government and the economy?
 - Bookable assets – marginal agricultural land
 - Government resource allocation to the management of land for environmental and agriculture purposes etc
 - Environmental markets – opportunities for investment

SEEA Central Framework (CF)



1.

Additions
or Inflows



Subtractions
or Outflows

2.



3.



SEEA CF in practice



Spreadsheets & charts

7.16 Economic demonstrated stock of timber, Physical

Microsoft Excel - 4628055001do001_201205.xls [Read-Only]

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Australian Bureau of Statistics

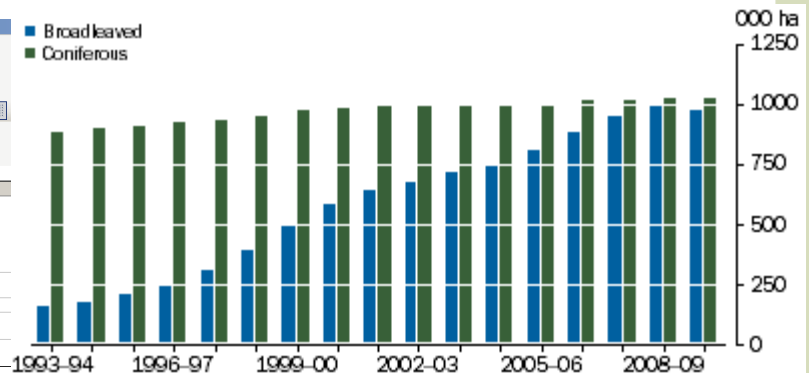
4628055001DO001_201205 Completing the Picture - Environmental Accounting in Practice, May 2012

Released at 11:30 am (Canberra time) Thurs 10 May 2012

Table 40 Timber Resources stock account, physical, (hectares, cubic metres) Australia-2001 to 2010

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Timber resources - Plantation										
Opening stock										
Broadleaved ('000 ha)	588	638	676	716	740	807	883	950	991	973
Coniferous ('000 ha)	980	988	988	1,001	990	1,001	1,010	1,014	1,020	1,024
Total opening stock ('000 ha)	1,569	1,626	1,664	1,716	1,739	1,818	1,903	1,973	2,020	2,009
Additions to stock										
Growth in stock (new areas planted)										
Broadleaved ('000 ha)	74	49	31	46	66	67	76	66	43	21
Coniferous ('000 ha)	10	5	11	7	6	11	11	6	6	3
Reclassifications ('000 ha)										
Total additions to stock ('000 ha)	84	54	42	54	72	78	87	72	50	24
Reductions in stock										
Removal										
Broadleaved (m3)	975	1,112	1,594	1,819	2,938	3,779	4,052	4,270	4,746	4,564
Coniferous (m3)	12,697	13,356	13,911	14,589	14,196	14,379	14,590	15,157	13,314	14,436
Felling residues (m3)										
Natural losses (m3)										
Catastrophic losses (m3)										
Reclassifications (m3)										
Total reductions in stock (m3)	13,672	14,468	15,505	16,408	17,132	18,159	18,641	19,428	18,060	19,000
Closing Stock of timber - plantation ('000 ha)										
Timber resources - Native										
Opening stock										
Broadleaved ('000 ha)			162,080					147,397		
Additions to stock										
Natural growth										
Broadleaved ('000 ha)										
Reclassifications ('000 ha)										
Total additions to stock ('000 ha)										
Reductions in stock										
Broadleaved (m3)	10,802	9,831	10,314	10,090	9,868	8,575	8,551	8,940	7,739	6,617
Felling residues (m3)										
Natural losses (m3)										
Catastrophic losses (m3)										
Reclassifications (m3)										
Total reductions in stock (m3)	10,802	9,831	10,314	10,090	9,868	8,575	8,551	8,940	7,739	6,617
Closing Stock of timber - native ('000 ha)										

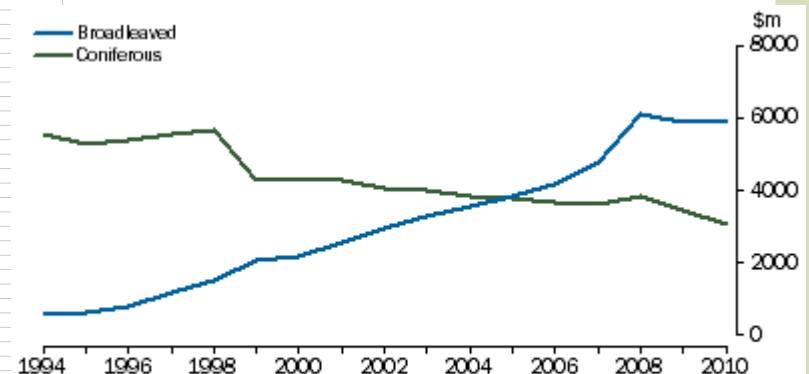
Source: Australian Forest and Wood Product Statistics, ABARES



Note: Figures are experimental and should be treated with caution.

Source: ABS data available on request.

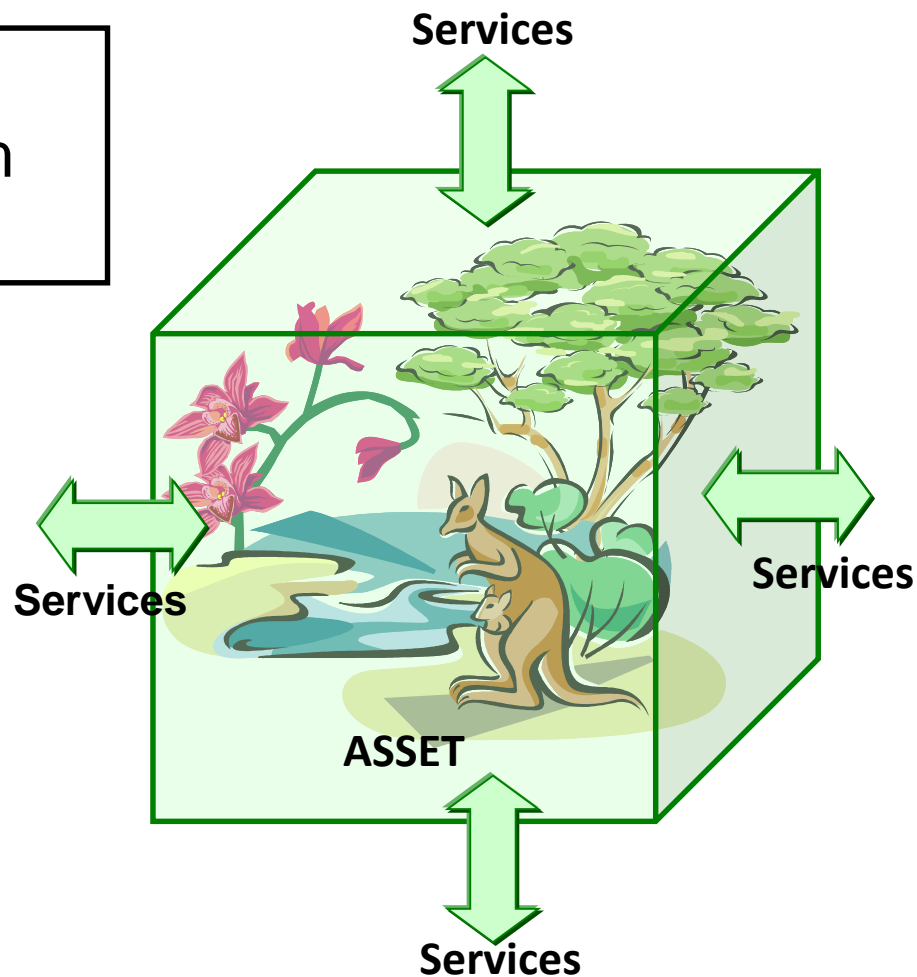
7.17 Value of timber resources, Monetary



Note: Figures are experimental and should be treated with caution.

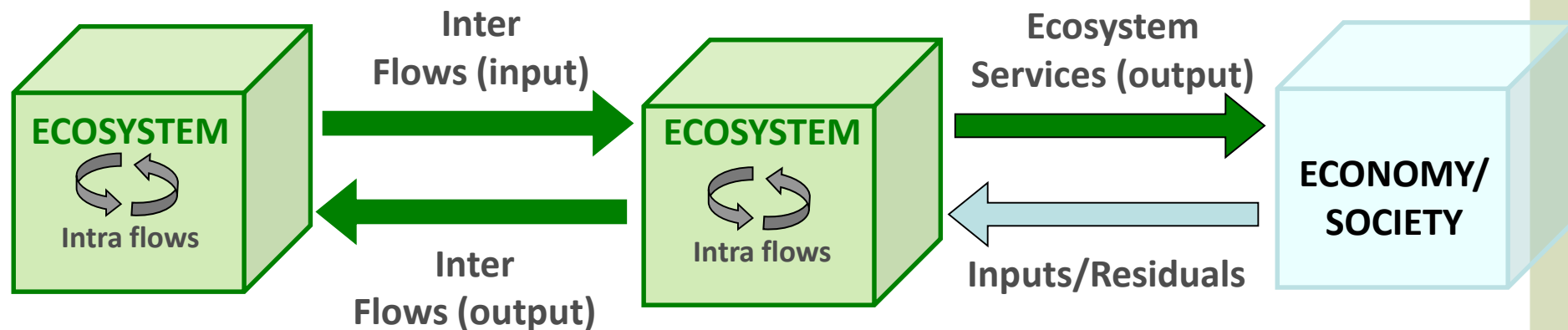
Source: ABS data available on request.

SEEA
Ecosystem
Accounts



Victorian approach to Ecosystem Accounts

Victorian Ecosystem accounting concepts

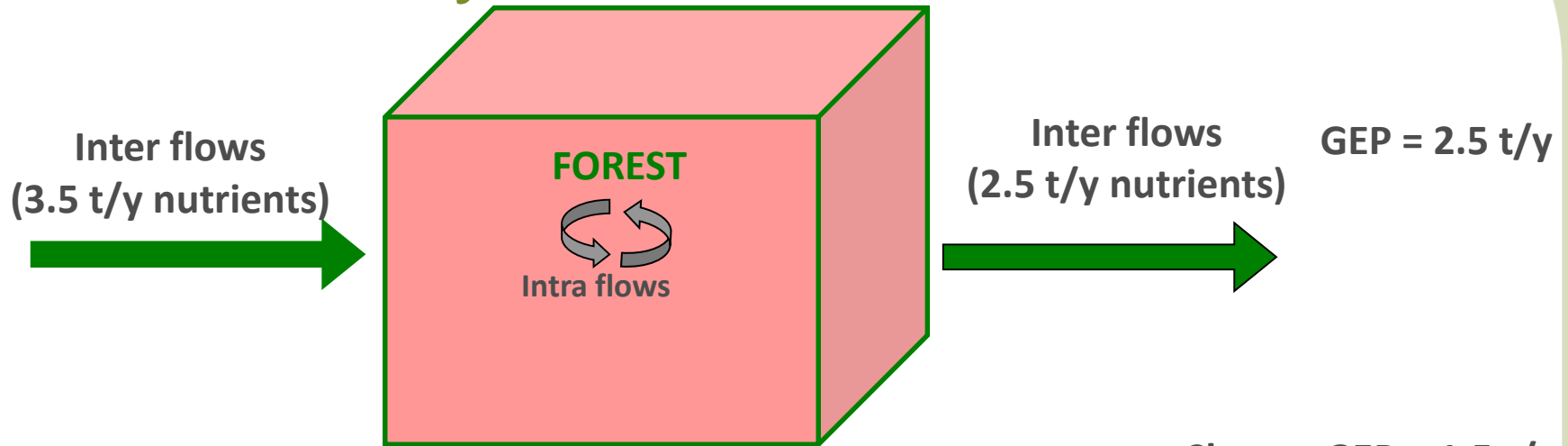


Gross Ecosystem Product (GEP)

Step	Gross Domestic Product (GDP)	Gross Ecosystem Product (GEP)*
1	Estimate the Gross Output of various economic activities	Estimate the Gross Ecosystem Output (clean air, water, etc) from an ecosystem asset (sum of ecosystem services and inter flows)
2		
3		
4		

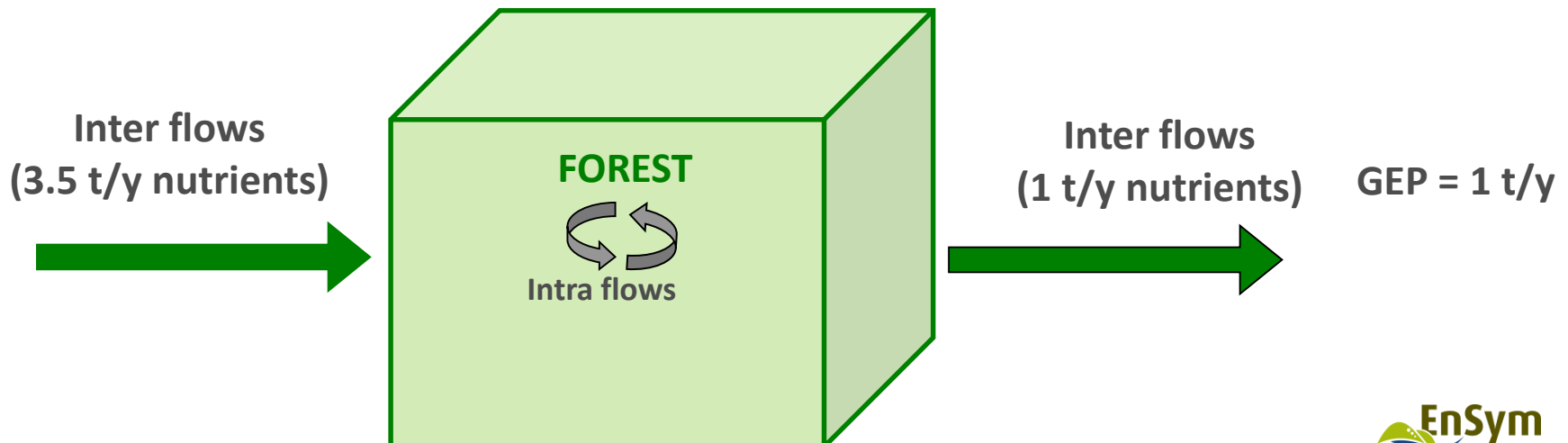
*) Eigenraam et al., 2012

Gross Ecosystem Product



Change GEP = 1.5 t/y

The ecosystem (FOREST) is improved to process more nutrients **Ecosystem Service**
- Clean water



Victoria's Catchment Management Authorities

Department of
Sustainability and
Environment



Victorian bioregions



LoM	Lowan Mallee	GipP	Gippsland Plain	WPro	Wilsons Promontory
MuM	Murray Mallee	OIP	Otway Plain	HSF	Highlands - Southern Fall
Wim	Wimmera	WaP	Warrnambool Plain	HNF	Highlands - Northern Fall
GleP	Glenelg Plain	Gold	Goldfields	OIR	Otway Ranges
Brid	Bridgewater	CVU	Central Victorian Uplands	Strz	Strzelecki Ranges
VVP	Victorian Volcanic Plain	GGr	Greater Grampians	MonT	Monaro Tablelands
VRiv	Victorian Riverina	DunT	Dundas Tablelands	HFE	Highlands - Far East
MSB	Murray Scroll Belt	NIS	Northern Inland Slopes	VAip	Victorian Alps
RobP	Robinvale Plains	EGL	East Gippsland Lowlands		
MuF	Murray Fans	EGU	East Gippsland Uplands		

ABS – Statistical Areas Level 4

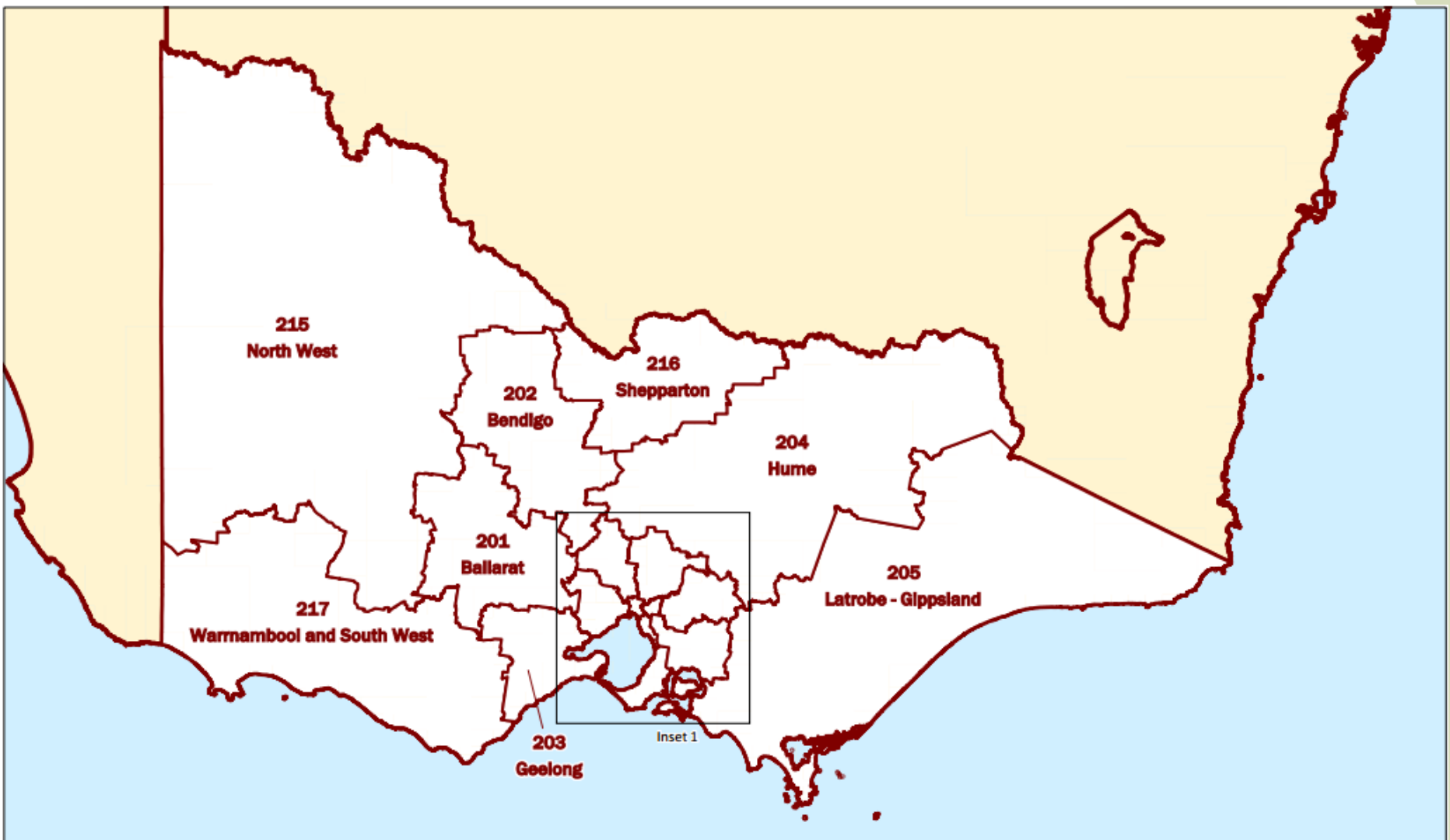
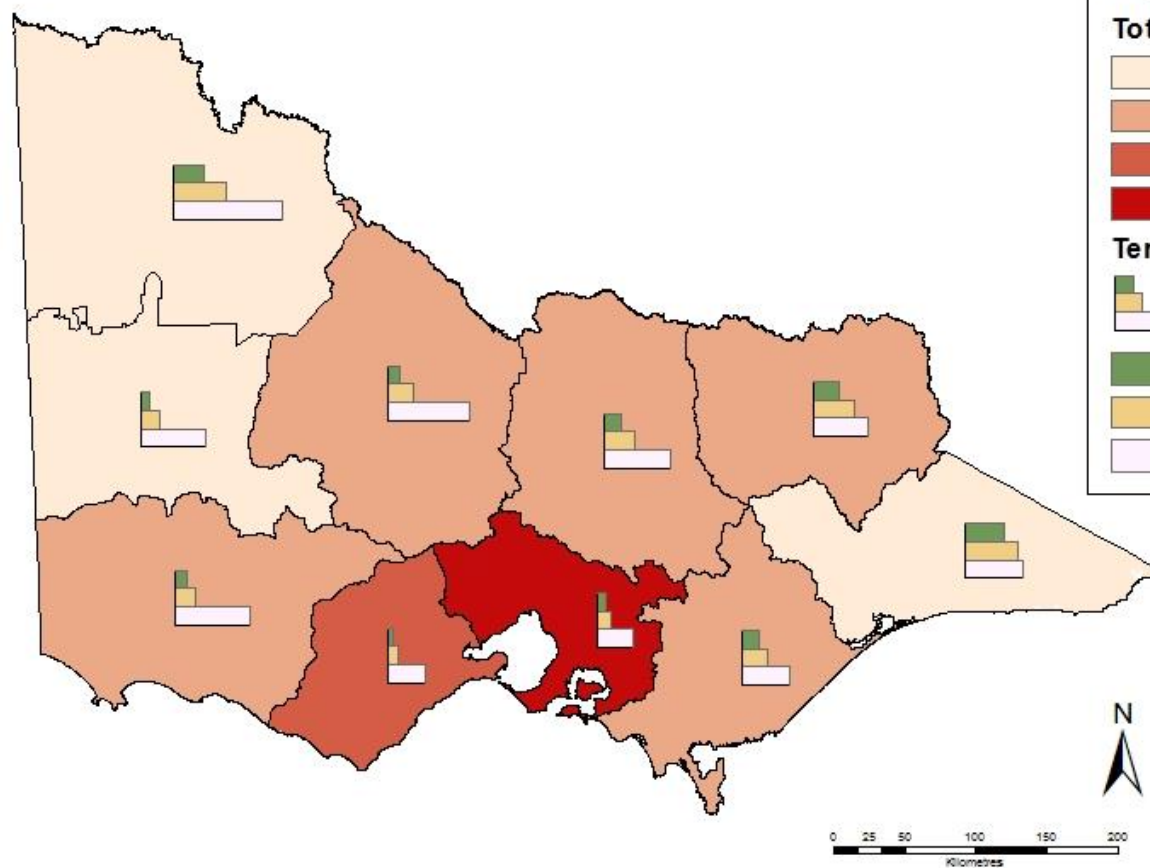


Table 14. Ecosystem service flow account, by land use, 2010 and 2015 (predicted)

Environmental Benefits Index (EBI)	Agriculture	Forestry	Aquaculture	Use of built up and related areas	Land used for maintenance and restoration of environmental functions	Other uses of land	Land not in use	Total
<i>Annual EBI Flow to 30 June 2010</i>	271,304,904							271,304,904
Increase in EBI flow due to:								
Improved management					35,855,034			35,855,034
Reclassification					270,155,361			270,155,361
Reduction in EBI flow due to:								
Natural losses	(84,838)							(84,838)
Reclassification	(270,155,361)							(270,155,361)
<i>Annual EBI Flow to 30 June 2015</i>	1,064,706				306,010,395			307,075,101
<i>Change in annual flow</i>								35,770,196

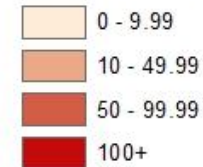
Corangamite Catchment Management Authority: Terrestrial vegetation type by area and average vegetation condition, 1750 and 2005

Major Vegetation Group (NVIS)	1750		2005	
	Extent (Ha)	Mean condition/Ha	Extent (Ha)	Mean condition/Ha
<u>Native vegetation</u>				
Acacia Forests and Woodlands	2,538	1.00	1,477	0.50
Acacia Open Woodlands				
Acacia Shrublands				
Callitris Forests and Woodlands				
Casuarina Forests and Woodlands	1,707	1.00	1,368	0.54
Chenopod Shrublands, Samphire Shrublands and Forblands	78	1.00	74	0.59
Eucalypt Open Forests	401,952	1.00	232,434	0.62
Eucalypt Open Woodlands	206,440	1.00	19,590	0.36
Eucalypt Tall Open Forests				
Eucalypt Woodlands	290,684	1.00	73,000	0.52
Heathlands	13,078	1.00	2,582	0.57
Low Closed Forests and Tall Closed Shrublands	26,925	1.00	3,579	0.46
Mallee Open Woodlands and Sparse Mallee Shrublands				
Mallee Woodlands and Shrublands				
Mangroves	4,431	1.00	3,332	0.57
Melaleuca Forests and Woodlands				
Naturally bare - sand, rock, claypan, mudflat				
Other Forests and Woodlands	195	1.00	62	0.45
Other Grasslands, Herblands, Sedgelands and Rushlands	23,038	1.00	6,189	0.49
Other Open Woodlands				
Other Shrublands	25,850	1.00	7,311	0.55
Rainforests and Vine Thickets	10,773	1.00	9,579	0.69
Tussock Grasslands	275,731	1.00	18,761	0.40
Unclassified native vegetation				
Total native vegetation	1,283,420	1.00	379,338	0.57
<u>Land not classified as native vegetation</u>				
Sea and estuaries				
Inland aquatic - freshwater, salt lakes, lagoons	50,473	NA	51,962	NA
Cleared, non-native vegetation, buildings			902,588	NA
Unknown/no data				
Unclassified	170	NA	175	NA
Total non-native vegetation	50,643	NA	954,725	NA

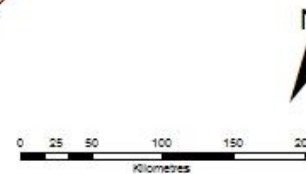
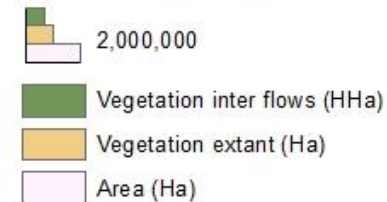


Legend

Total ratable value of land (\$ billion) by CMA



Terrestrial assets



Modelled Native Vegetation Quality, Victoria

Map created Dec 2012; Data source: NV 2005_QUAL, CSDL, DSE (2008)

Author: Jessica Hasker, ecoMarkets

Map Grid of Australia 1994 (MGA94)

Disclaimer: This map may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

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