

Valuing productive natural assets and ecosystems in grazed landscapes

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14 March 2018

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What I'll cover

- Features of the NT pastoral estate
- Livestock carrying capacity and stocking rate
- Grazing behaviour and land condition
- Natural Capital Accounting case study

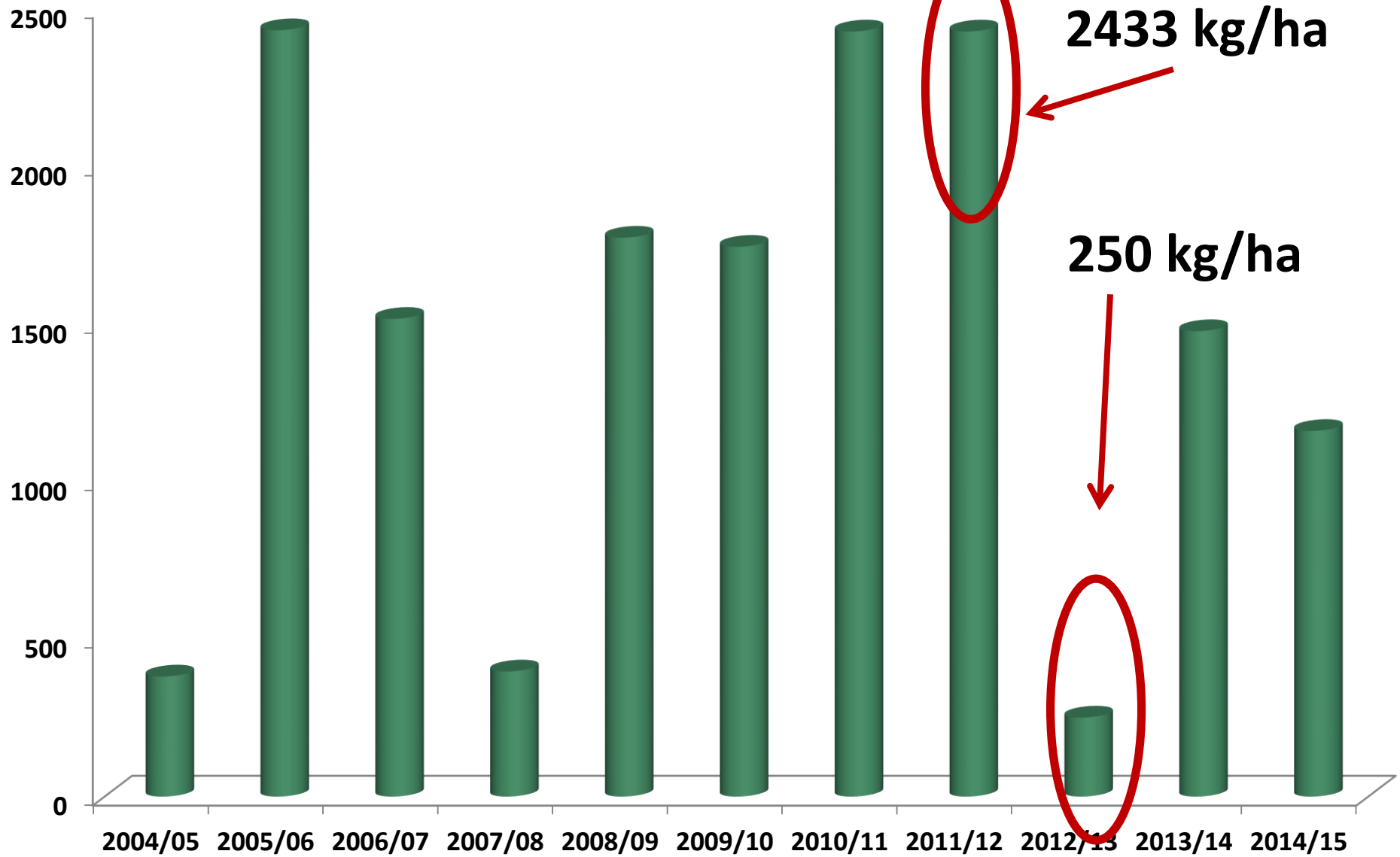


Features of the NT pastoral estate

- ~45% of the land area of the NT
- ~ 223 pastoral leases
- + some freehold blocks + Aboriginal land
- Mostly rain-fed native or naturalised pastures
- Highly variable – in space and time



Black soil pasture growth (kg/ha)

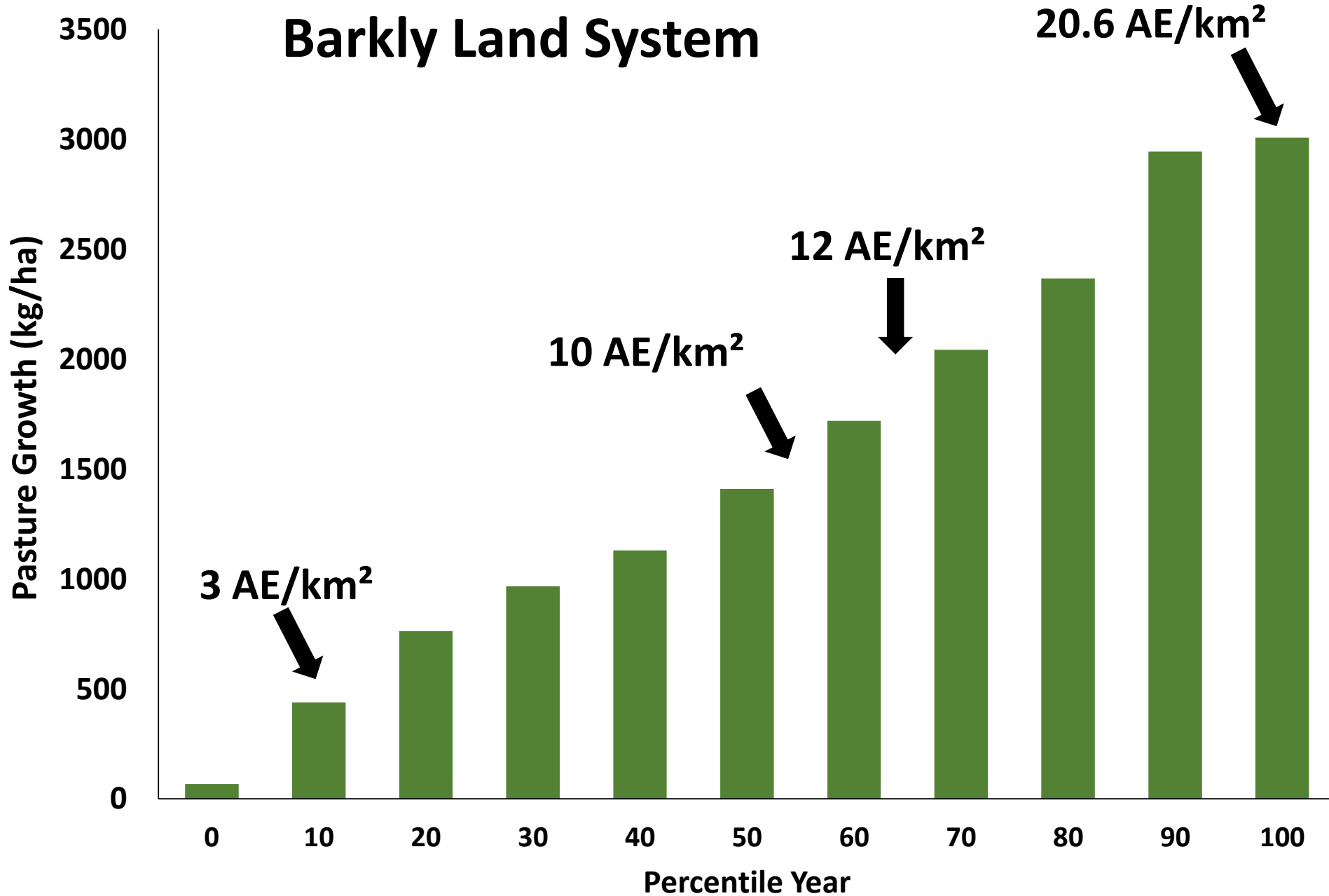


Carrying capacity and stocking rate

- CC is calculated based on:
 - Pasture growth for each land type
 - % of the annual growth that can be sustainably consumed
 - Discounts for accessibility
- CC = a long-term benchmark for that land type
- Stocking rate is the current no. of animals



Barkly Land System



Grazing behaviour

- During the dry season cattle drink daily
- Cattle prefer some vegetation types
- Different soil types in wet and dry season
- Cattle seek out other attractants (e.g. shade)





~90% of grazing occurs within 5km of water
~60% of this occurs within 3km of water

Land types vary in their tolerance to grazing – resulting in overgrazing and under-grazing in relation to safe CC

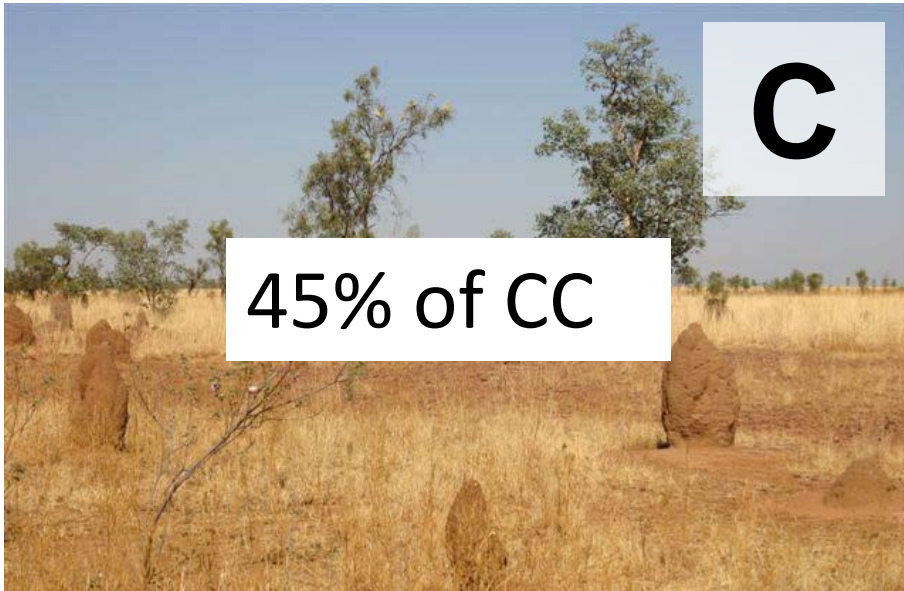
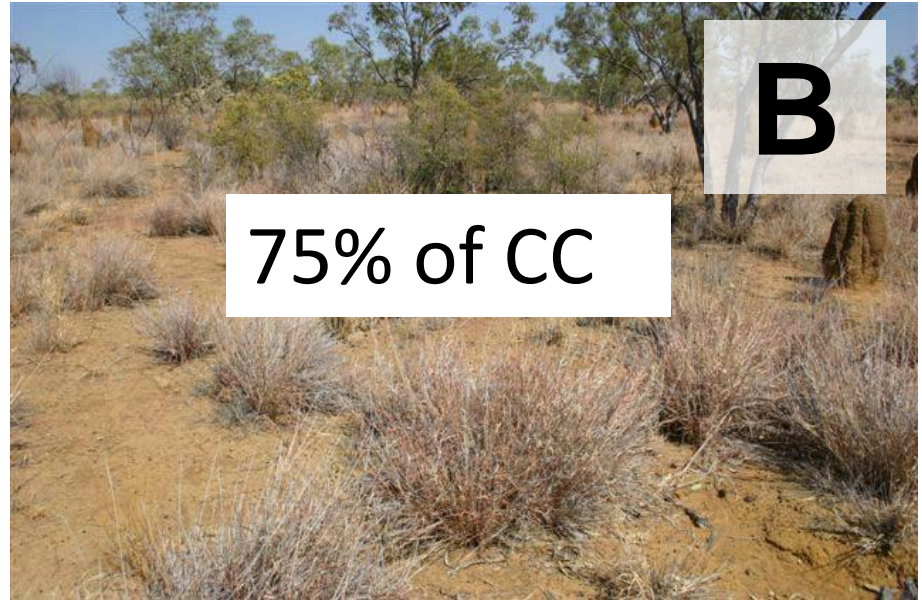
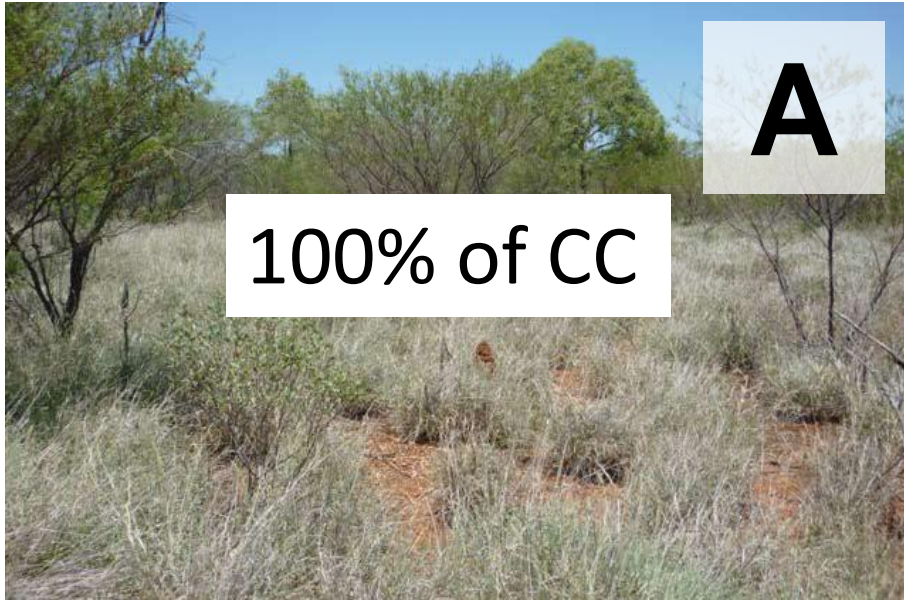


Land condition

“The capacity of land to respond to rain and produce useful forage – a measure of how well the grazing ecosystem is functioning”

- Indicators reflect water, energy and nutrient cycles
 - Density and health of 3P (palatable, perennial and productive) species
 - Ground cover and infiltration
 - Soil erosion
 - Weeds
- Land condition influences carrying capacity and animal production

ABCD land condition framework



Natural Capital Accounting

A case study

- Australian Indigenous Agribusiness Company Pty Ltd
 - My Farm Shop (Sue Ogilvy)
 - NT Department of Primary Industry and Resources
 - FarmMap4D
 - Australian Government funding
-
- Can we monetize land condition?
 - Can this be presented in a chart of accounts?
 - What practical applications might this have?

Accounting = What you own and what you owe

Balance Sheet

What you 'own' on balance day

Natural Capital:

Extent & condition of ecosystems - capacity to generate forage.

What you 'owe' on balance day

Opportunity cost for natural capital restoration:

a reduction in grazing to allow restoration of condition.

Accounts

Changes since the last period

Natural capital formation (consumption):

Increases (decreases) in natural capital in each period.

Your obligations (why you owe on balance day)

Obligation to restore natural capital:

Accumulated increases (decreases) to estimate amounts of natural capital that need to be restored.

≡ Net natural capital available for production this year

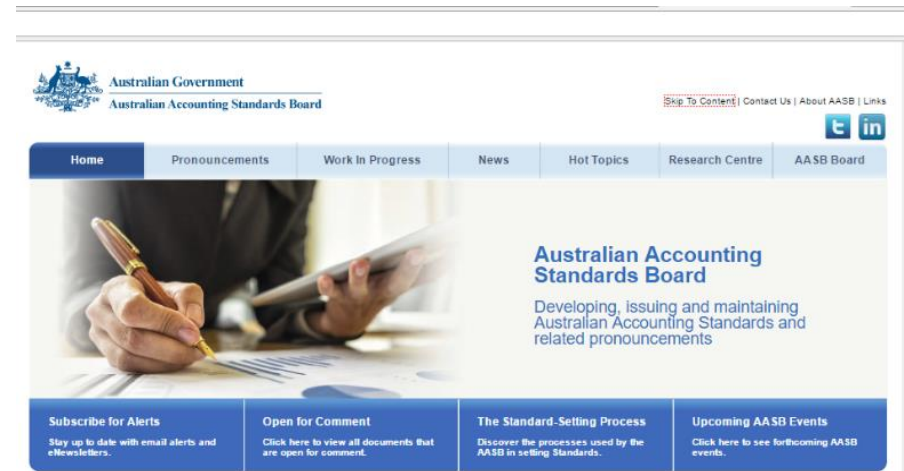
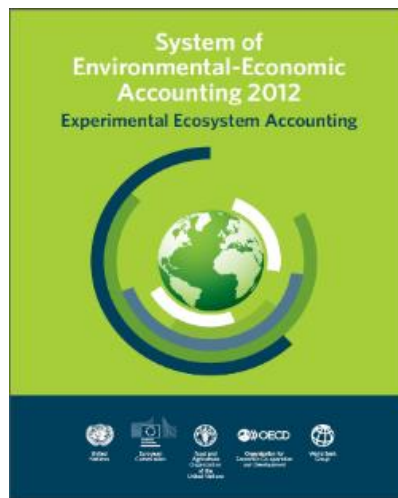
The accounting premise: physical capital maintenance, a requirement to maintain the condition of the ecosystem at or above a level specified

Formal accounting systems

National Accounting

Used by statistical organisations to report the performance and prospects of national economies

The UN has endorsed concepts and methods for valuation of ecosystems and services



Corporate Accounting

Used by companies to report their performance and prospects to stakeholders

What is the capacity to produce forage?

Area of each Land Type in each Land Condition class

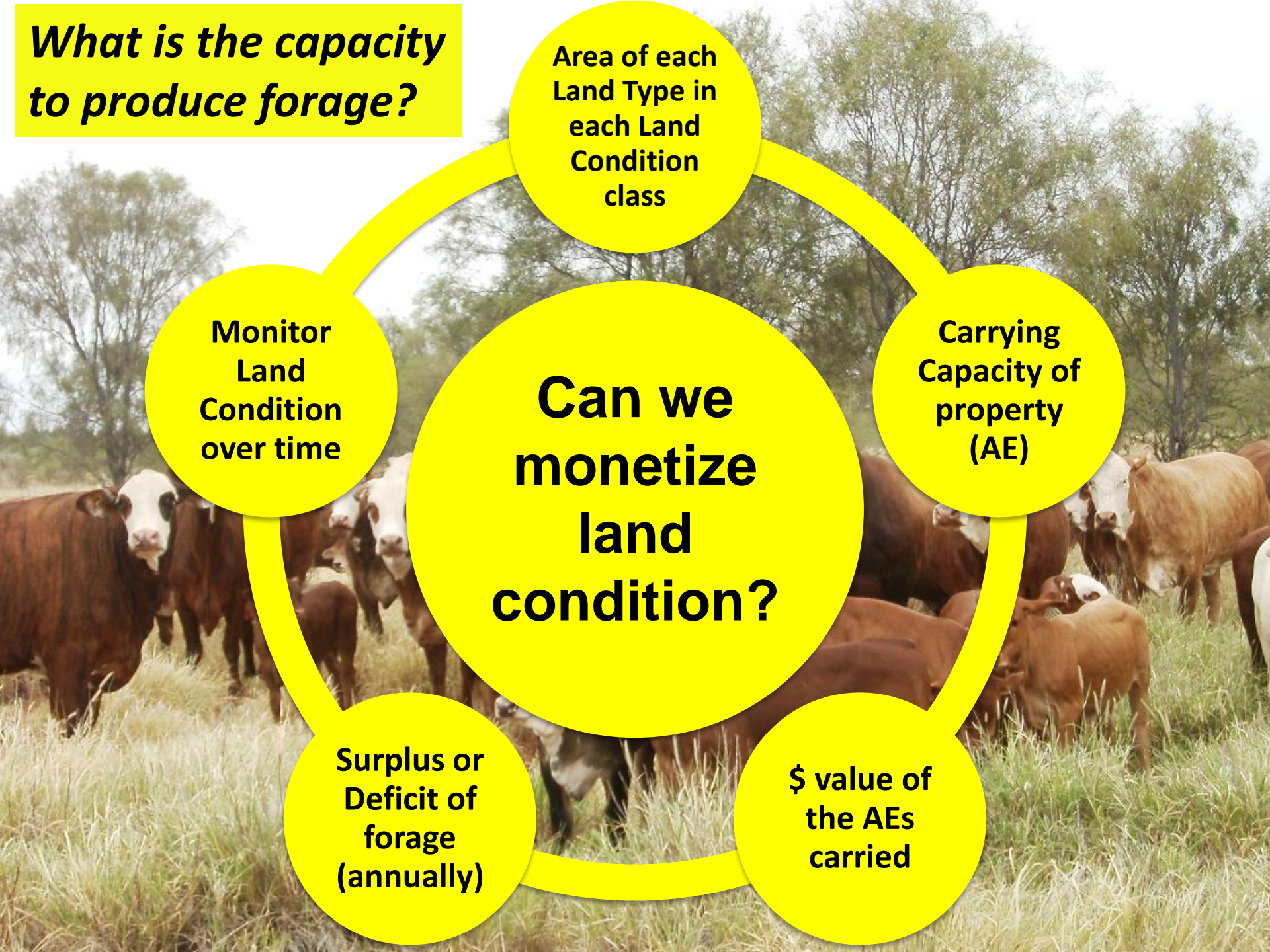
Monitor Land Condition over time

Carrying Capacity of property (AE)

Can we monetize land condition?

Surplus or Deficit of forage (annually)

\$ value of the AEs carried



Theoretical example:

Land condition account 2007 to 2012

Grazing land condition account for the period 2007 to 2012		Condition Classes (area in hectares)				
		A	B	C	D	Total
Opening Balance at 1 July 2007		56,142	28,952	4,659	-	89,753
	A	-	33,917	7,888	905	
	B	1,358	-	16,924	1,343	
	C	-	172	-	2,847	
	D	-	-	-	-	
	<i>Additions</i>	<i>1,358</i>	<i>34,091</i>	<i>24,812</i>	<i>5,096</i>	
	A	-	1,358	-	-	
	B	33,919	-	172	-	
	C	7,888	16,924	-	-	
	D	905	1,343	2,847	-	
	<i>Reductions</i>	<i>42,711</i>	<i>19,626</i>	<i>3,020</i>	<i>-</i>	
Closing Balance at 30 June 2012		14,789	43,417	26,451	5,096	89,753

Theoretical example: Asset account 2007 to 2012

Natural Capital Asset (Combined) Accounts at 30 June 2012	Extent-condition of land (ha)				Carrying Capacity AE Year	Monetary Value (\$)
	A	B	C	D		
Opening Balance (1 July 2007)	56,142	28,952	4,659	-	7,466	5,995,436
Increases in area (development)	-	-	-	-		
Improvements in condition	1,358	34,091	24,812	5,096	-	-
<i>Total Additions to Grazing Operation Asset base</i>	1,358	34,091	24,812	5,096		
Decreases in area (removal from grazing use)	-	-	-	-		
Declines in condition	42,712	19,626	3,020	-		
<i>Total Reductions to Grazing Operation Asset base</i>	42,712	19,626	3,020	-	2,077	1,668,276
Closing Balance @ 30 June 2012	14,789	43,417	26,451	5,095	5,388	4,327,160
Accumulated natural capital formation (consumption)	(13,026)				(544)	(436,840)
Natural capital required to meet lease conditions	27,815	33,987	25,001	2,729	5,932	4,764,000

- Monitoring systems and management records are crucial
- Finer-scale paddock level records - what is happening where?

Theoretical example: Natural Capital Balance Sheet

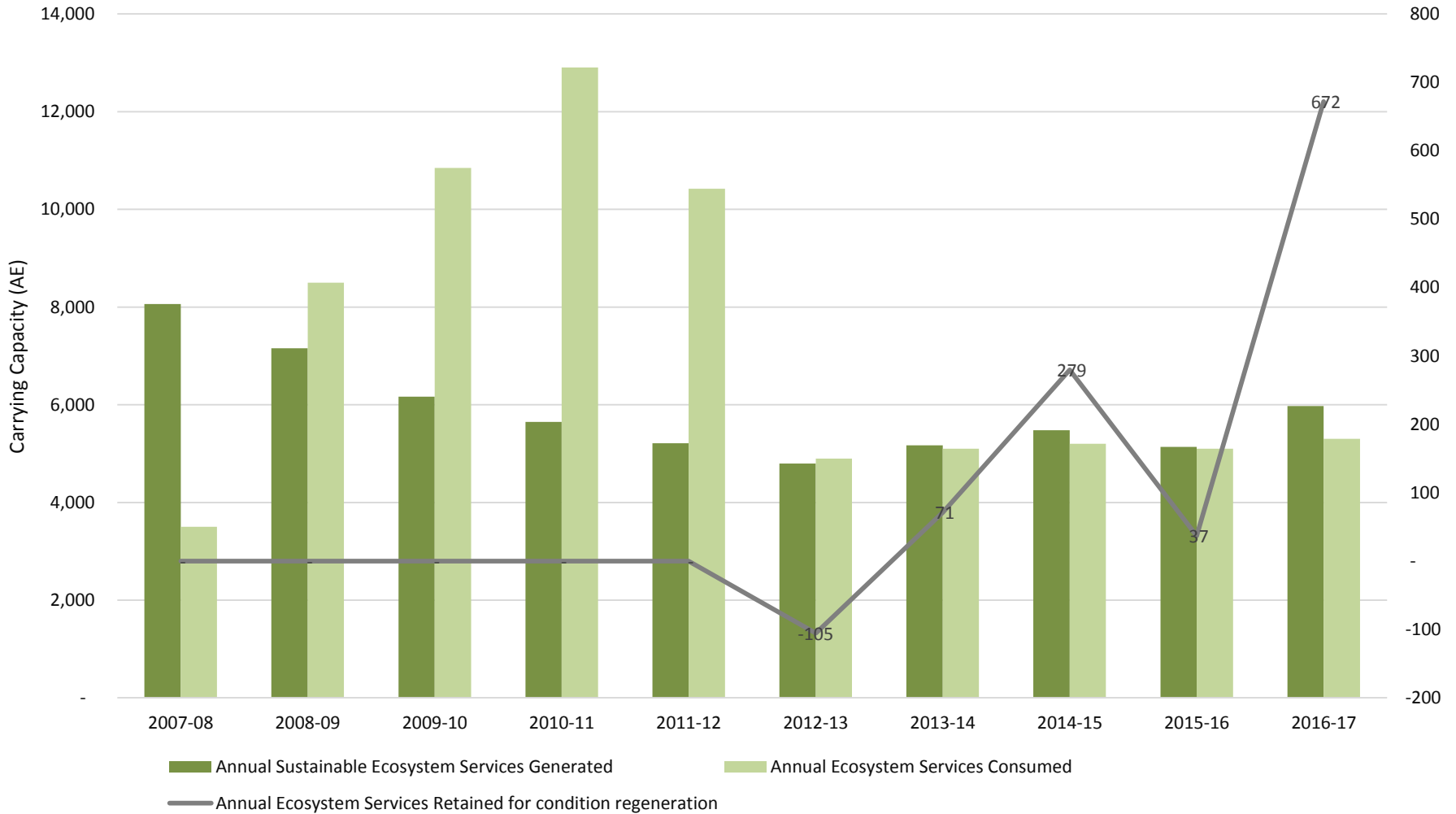
Natural Capital Balance Sheet
@ 30 June 2012

	Physical	Monetary
	(AE)	(\$)
Natural Capital Required	5,932	4,764,000
Natural capital formed (consumed) since 2007	(544)	(436,840)
Natural Capital @ 30 June 2012	5,388	4,327,160
Opportunity cost of reduced grazing to 30 June 2017 to satisfy obligation to restore natural capital	(169)	(76,025)
Net Natural Capital @ 30 June 2012	5,219	4,191,569

Note: The lessee discloses a contingent liability of \$1,139,598 reflecting the Net Present Value of an extended period of reduced stocking rates to restore land condition from its current condition to the condition required by the lease agreement.

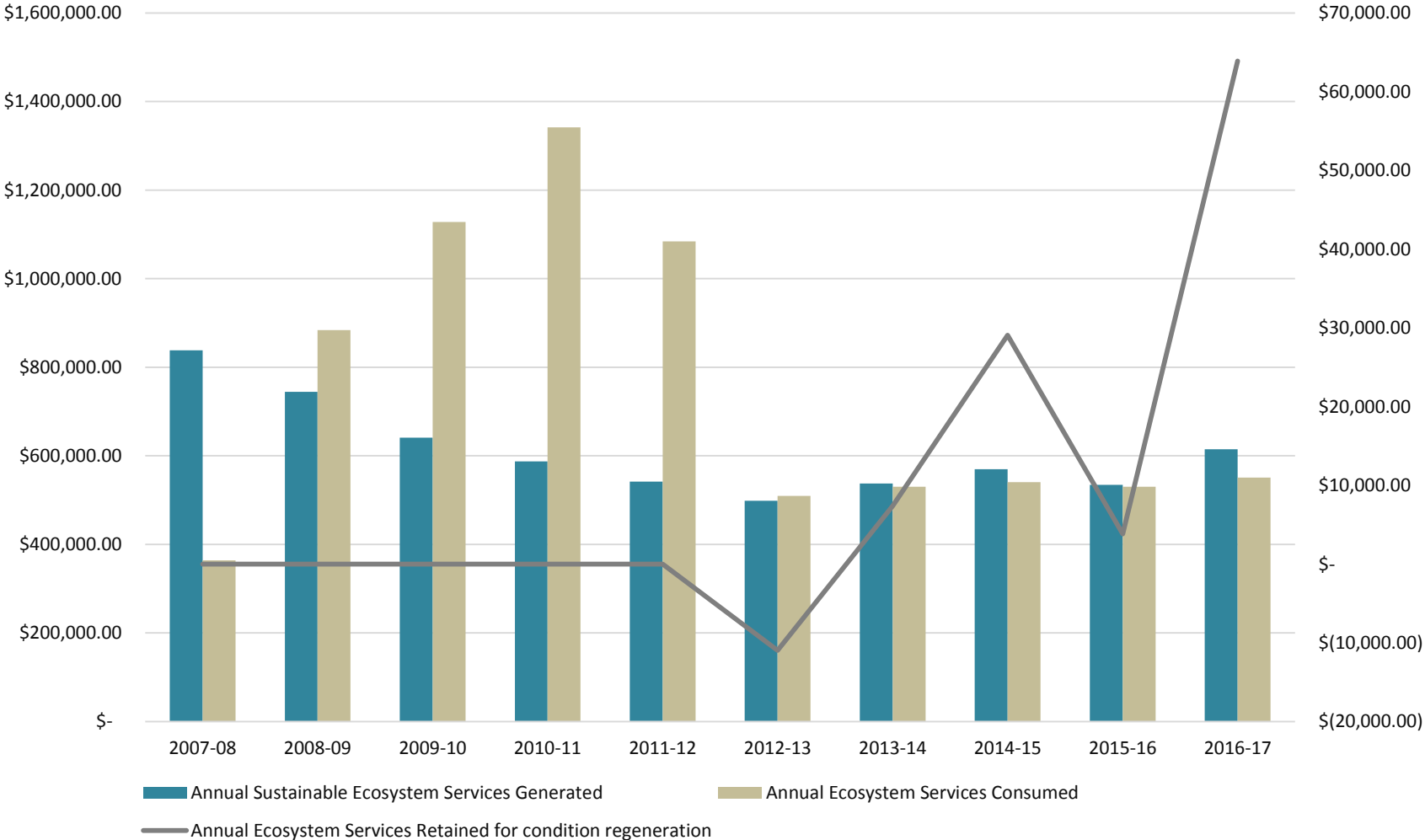
Theoretical example: Grazing accounts - physical

Grazing Accounts (Physical)



Theoretical example: Grazing accounts - monetary

Grazing Accounts (\$)



Practical applications?

- Early warning of risk of environmental degradation
- Help to assess long-term costs of short-term decisions
- Subleasing and agistment contracting
- Maintain and improve the productive capacity of the pastoral business
- Publicly demonstrate the environmental performance of the pastoral industry
- Underpin future payment for environmental services or impact investing

Where to from here?

- Land condition is a model of ecological function in grazed landscapes
- Can the accounting approach be applied to other values or assets?
- How might we value other assets and values in grazed landscapes?
- How can ecological monitoring be done in a cost-effective and practical way?



Questions?