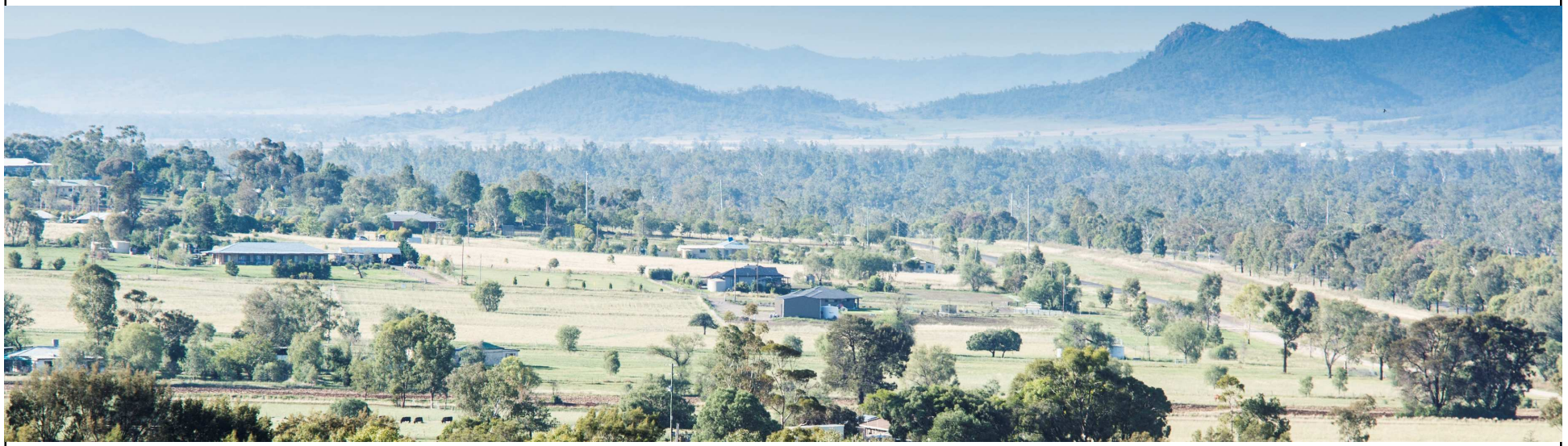
DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

BAM Support for Accredited Assessors

A series of webinars to support the role of accredited BAM assessors in the Biodiversity Offsets scheme (BOS)



For more information, go to the BAM Support Webinar webpage or contact us via the BOS Online Enquiry Form

Department of Planning, Industry and Environment

BAM SUPPORT WEBINAR 9

How does the BAM gain model apply at a Biodiversity Stewardship site?

Dr Josh Dorrough
Principal Scientist, Restoration Science Team
Department of Planning, Industry & Environment

Tuesday 7th April 2020
2:00pm - 3:00pm

Simone Cottrell/DPIE

Overview

TIME	ITEM	DESCRIPTION	DURATION
2:00pm	Introduction	Acknowledgment of Country Introduction and house keeping	10 mins
2:10pm	Content Presentation	This presentation will provide an overview of the science and implementation of Vegetation Integrity estimates of gain at Biodiversity Stewardship sites.	25 mins
2:35pm	Q & A session	Presenter and panel address participants' questions	20 mins
2:55pm	Wrap-up and Close	Closing remarks Participant feedback Upcoming webinars	5 mins

How does the BAM gain model apply at a Biodiversity Stewardship site?

RESEARCH ARTICLE

Expert predictions of changes in vegetation condition reveal perceived risks in biodiversity offsetting

Josh Dorrough[1]*, Steve J. Sinclair[2], Ian Oliver[3]

1 Ecosystem Management Science Branch, Science Division, Office of Environment and Heritage New South Wales, Merimbula, New South Wales, Australia, **2** Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, Heidelberg, Victoria, Australia, **3** Ecosystem Management Science Branch, Science Division, Office of Environment and Heritage New South Wales, Gosford, New South Wales, Australia

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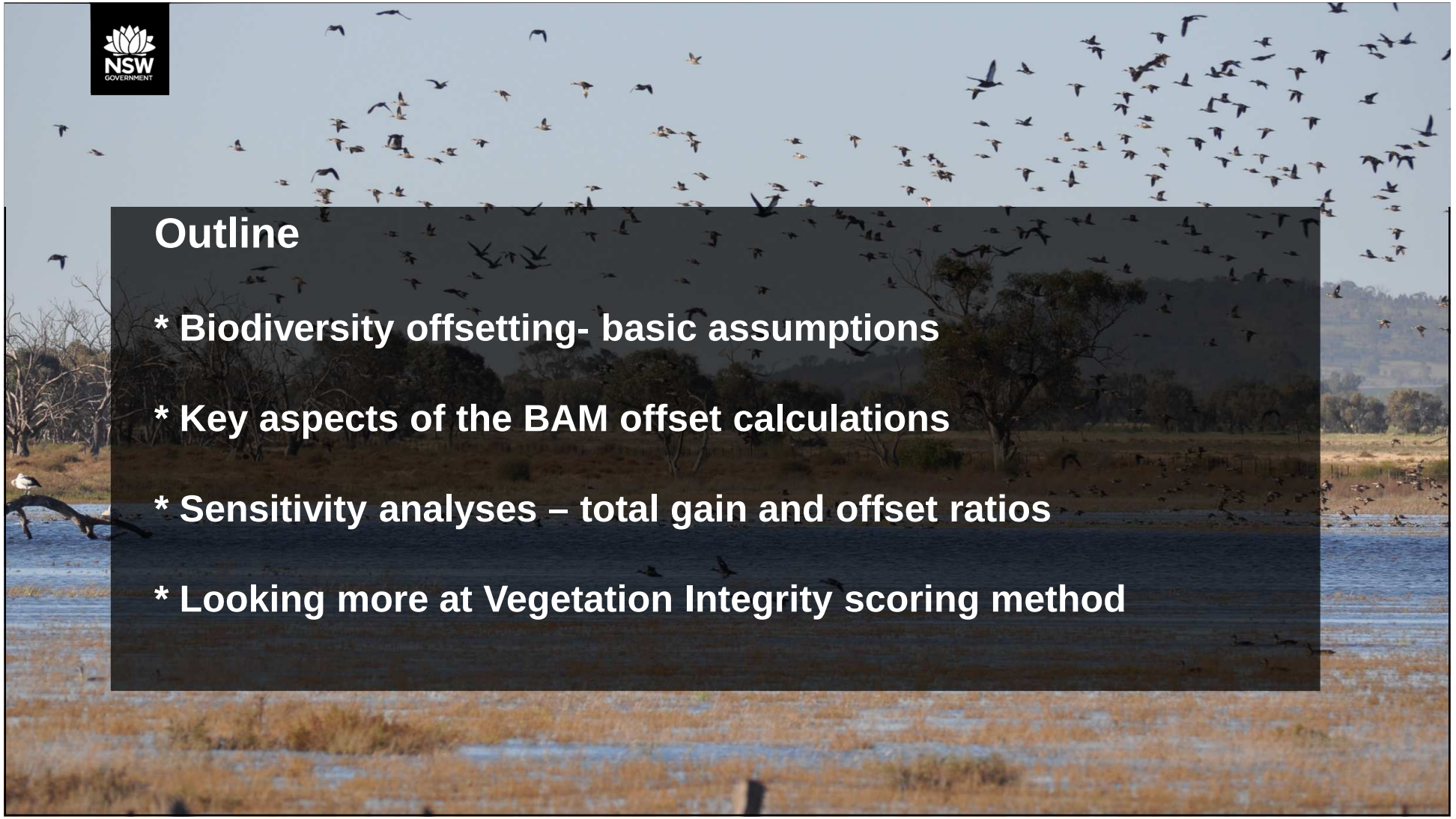
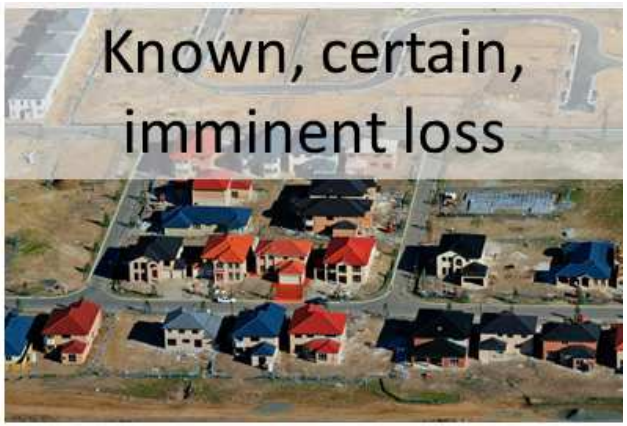
Citation: Dorrough J, Sinclair SJ, Oliver I (2019) Expert predictions of changes in vegetation

Abstract

Biodiversity offsetting typically involves the trade of certain losses of habitat with uncertain future conservation benefits. Predicting the latter requires estimates of two outcomes; the biodiversity losses without conservation management (averted loss), and the biodiversity gains with conservation management (management gain). However, because empirical data to inform these estimates are limited, they are normally guided by expert opinion, often derived via unstructured methods without consideration of uncertainty. Here we used a structured elic-


Outline
* Biodiversity offsetting- basic assumptions
* Key aspects of the BAM offset calculations
* Sensitivity analyses – total gain and offset ratios
* Looking more at Vegetation Integrity scoring method

Δ Biodiversity

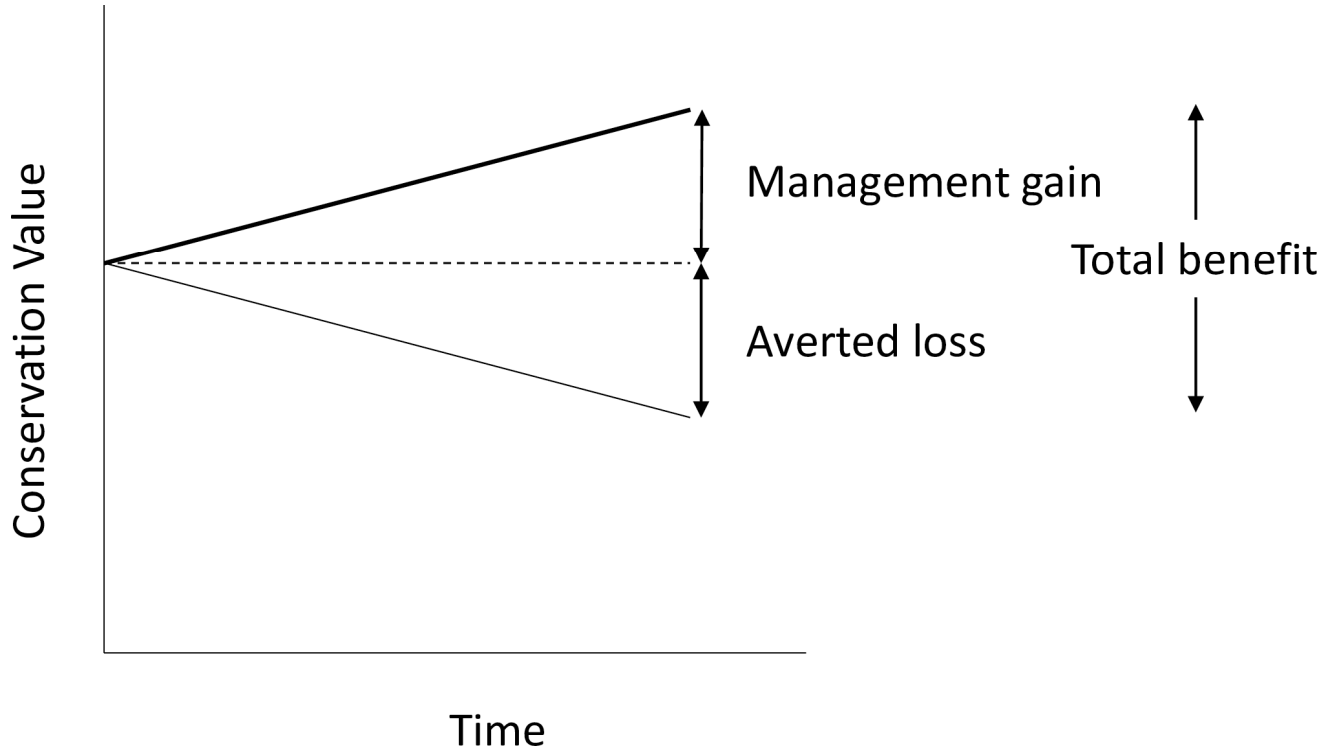


Δ Biodiversity

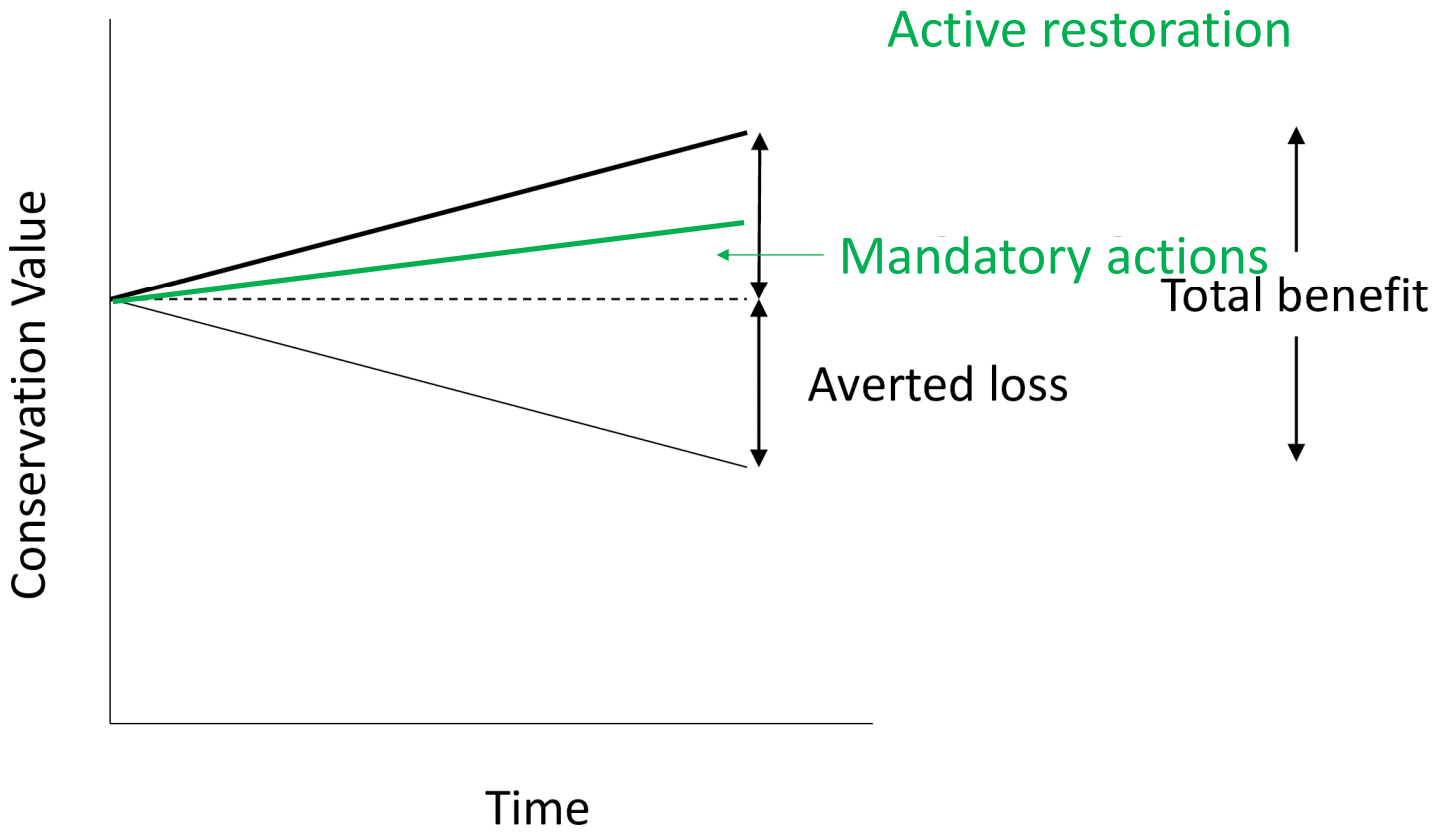
Unknown, uncertain,
future benefit

?

Calculating the total benefit of a biodiversity offset



Calculating the total benefit of a biodiversity offset



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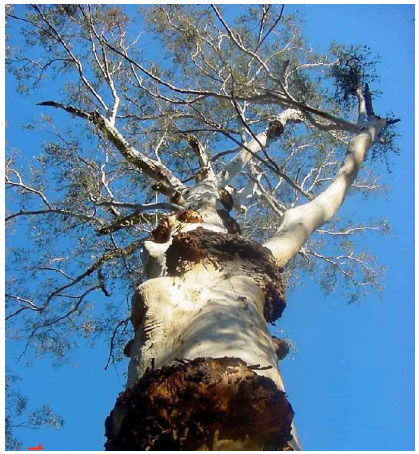
Prediction Time-frame

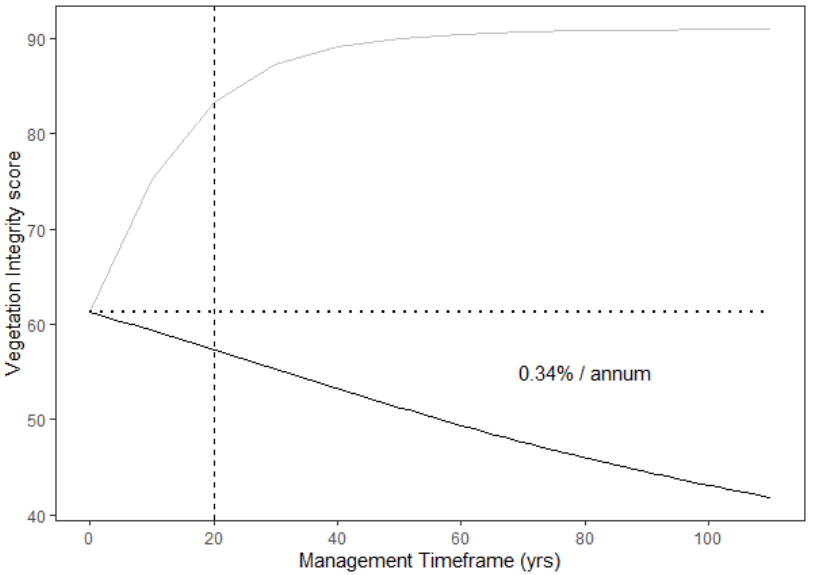
- 20 years
- Time-bound estimates necessary for monitoring
- Aligns with Australia Commonwealth offset policies
- Long time-frames require temporal discounting

100+ years



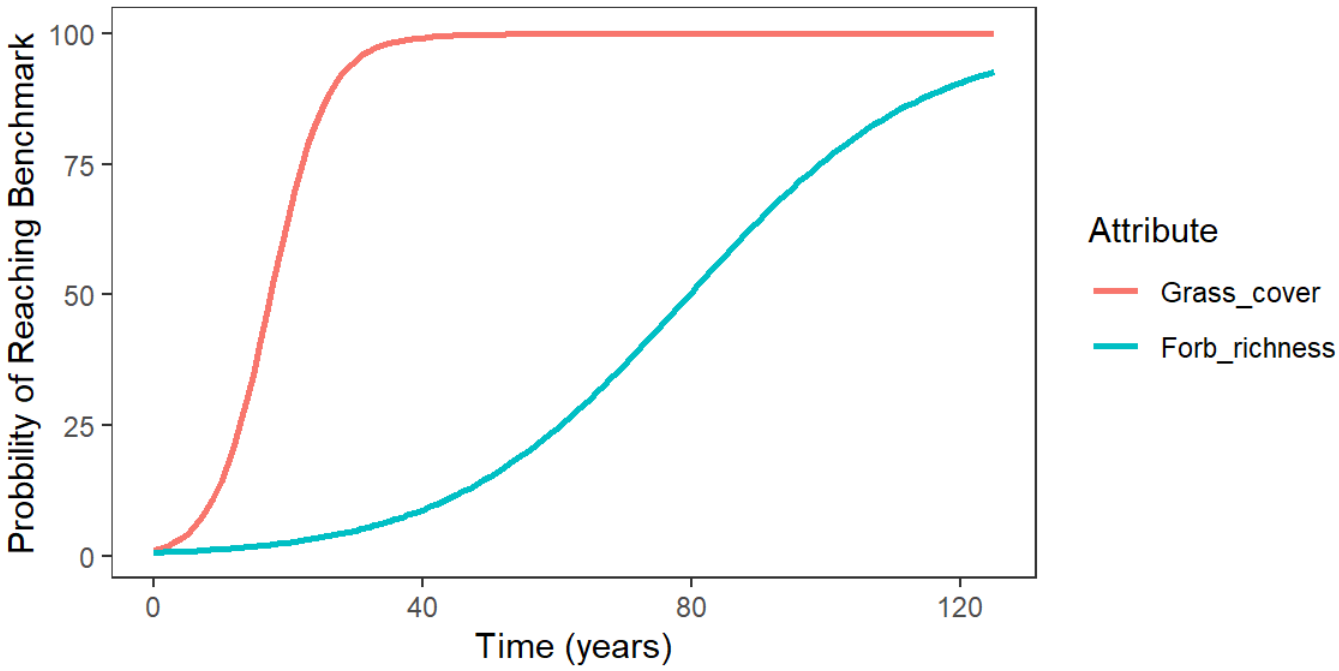
Averted loss

- Often overstated
- Losses estimated to be ~0.1% - 0.5% / annum
- Averted loss estimated at attribute level (0%-1%/ annum)
- Greater if high threat weeds are present and high risk lands



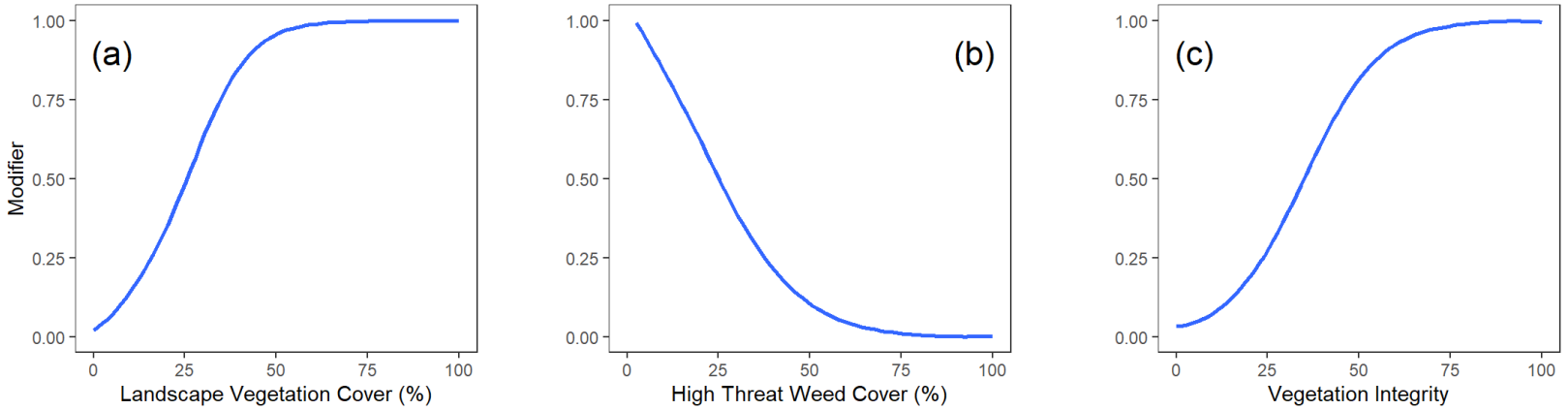
- *moderate condition site*
- *0% HTW*
- *high risk lands*

Management of threats and pressures – Mandatory actions



“Growth” of individual attributes is modified by:

- Landscape vegetation cover (landscape context)
- High threat weeds
- Initial Vegetation Integrity score (resilience)



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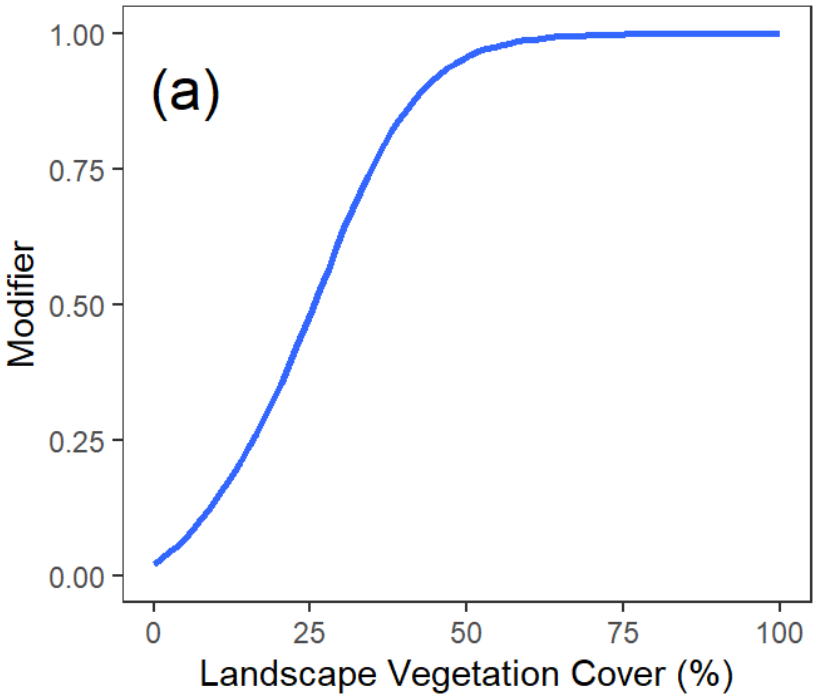
Management Gain – Landscape Context



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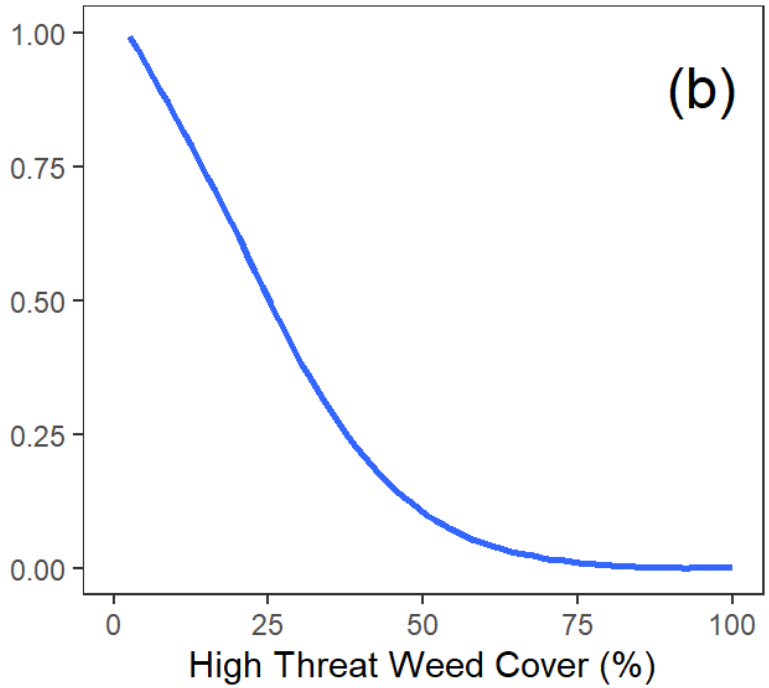
Management Gain – High threat weeds



Management of Biological Invasions (2018) Volume 9, Issue 3: 329–341
DOI: https://doi.org/10.3391/mbi.2018.9.3.15

Open Access

Research Article

Consensus when experts disagree: A priority list of invasive alien plant species that reduce ecological restoration success

Josh Dorrough[1,*], Ian Oliver[2] and Julian Wall[3]
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[2]*Office of Environment and Heritage New South Wales, PO Box 1477, Gosford NSW, 2250 Australia*
[3]*2rog Consulting, PO Box 2017, Armidale NSW, 2350 Australia*

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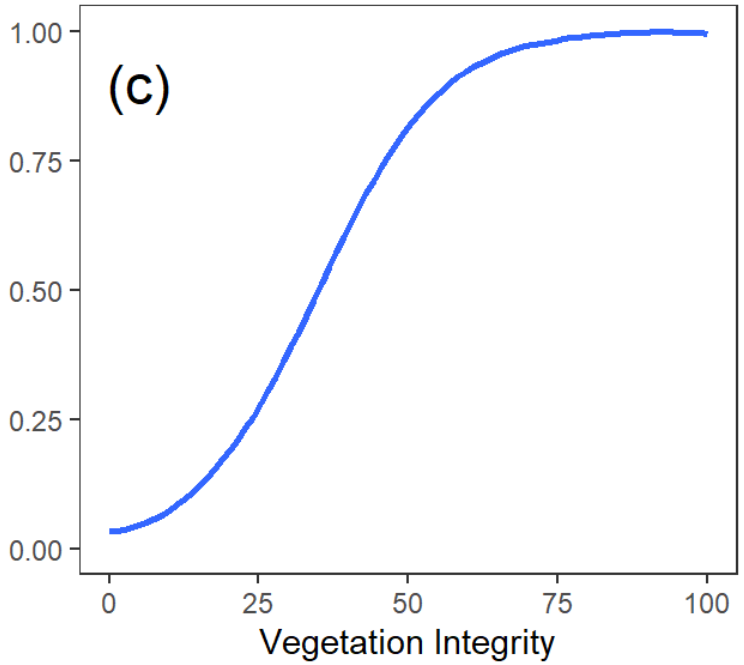
Management Gain – Resilience



Greater likelihood of supporting native plant recruitment and growth

- Increasing native seedbank diversity
- Increasing pollinator networks
- Improved soil surface conditions and soil nutrient cycling

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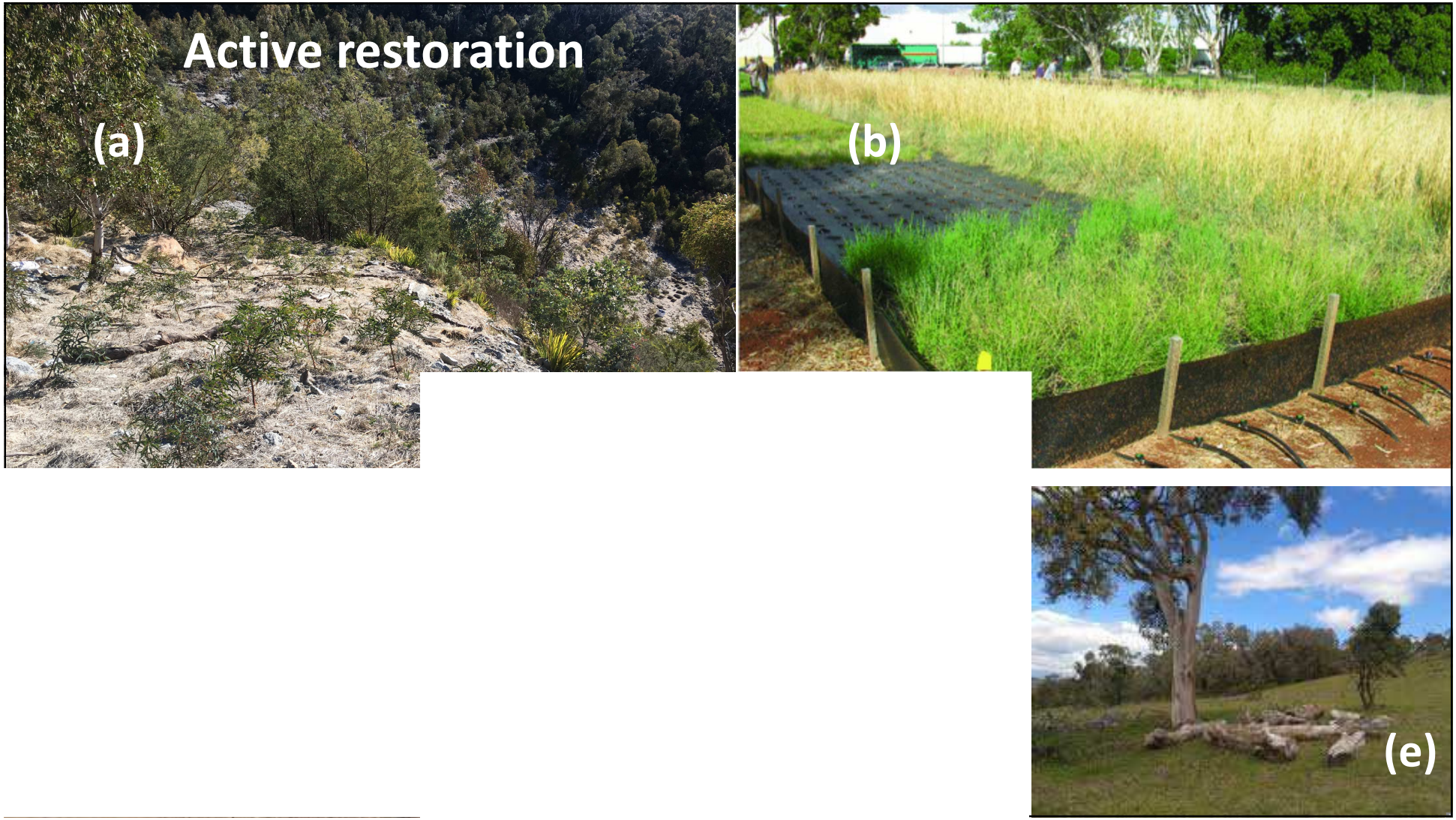
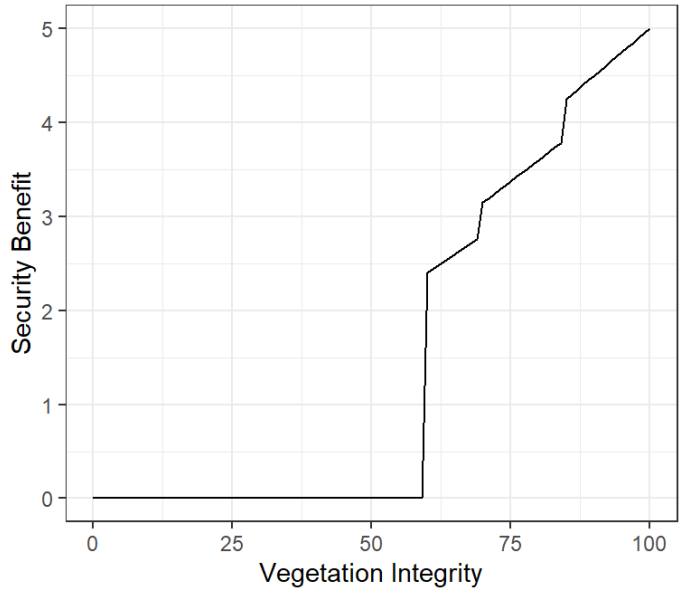

Active restoration
(a)
(b)
(e)

Security Benefit



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Sensitivity analyses - Effects of HTW, landscape vegetation cover initial VI

Three starting conditions – with and without active restoration

Condition Class	Structure Score	Composition Score	Function Score	Vegetation Integrity
LOW	33	21	19	**23**
MODERATE	58	59	67	**61**
HIGH	89	88	84	**87**

Benchmarks: Coastal Valley Grassy Woodland, Sydney Basin

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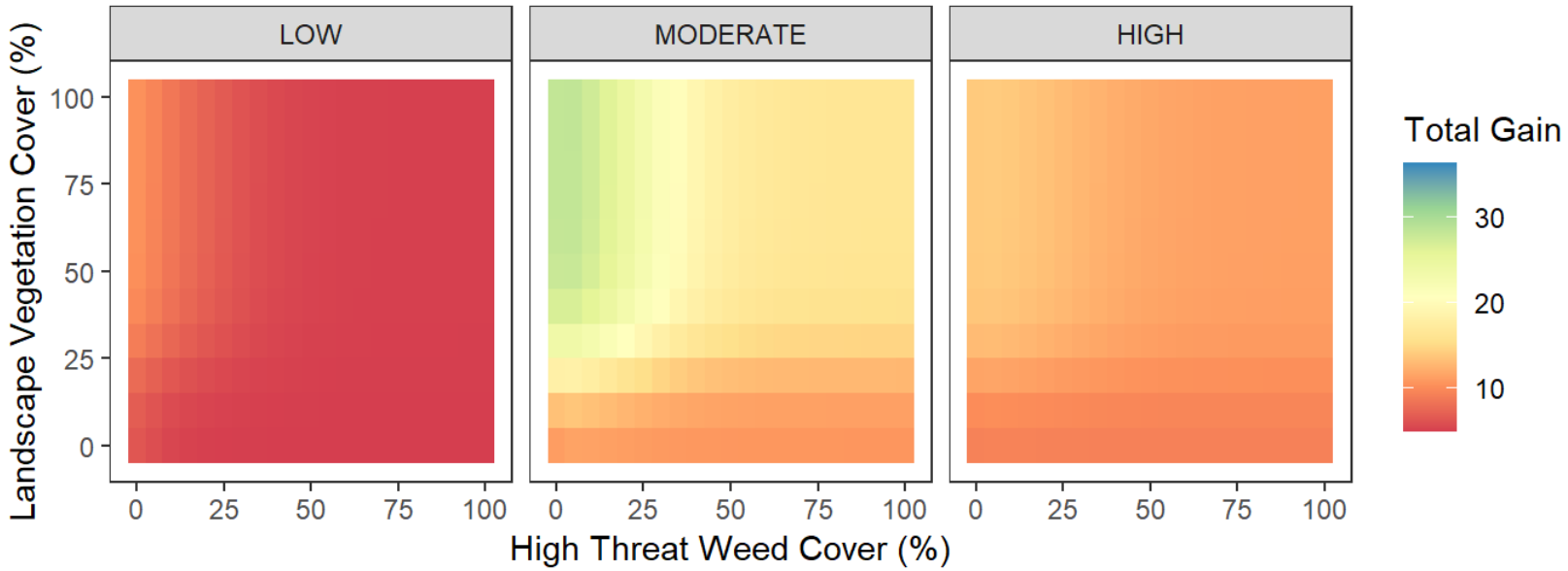
Total gain - Management of threats and pressures

Greatest for a moderate starting VI with low weed cover and in more intact landscapes



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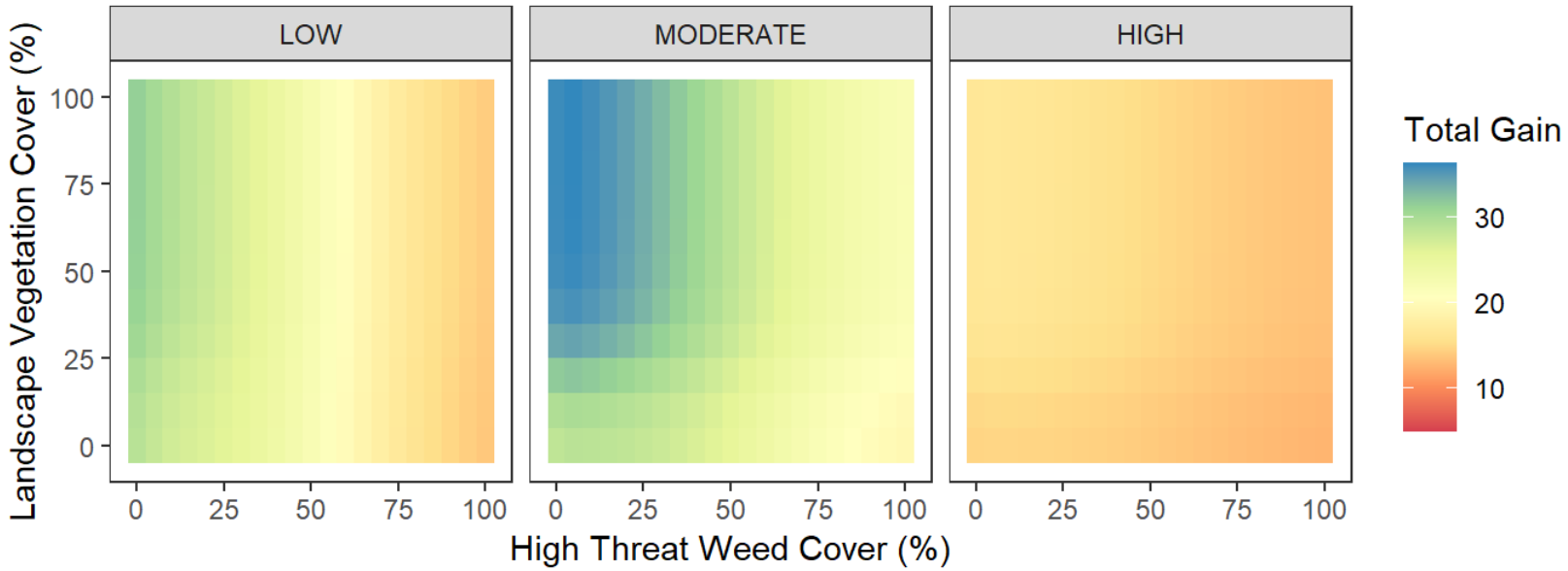
Total gain – Plus active restoration

Active restoration substantially increases potential gains



What about offset ratios?

- Area of a stewardship to offset 1 ha of loss

Development credit requirement:

- Vegetation Integrity
- Biodiversity risk weighting

	Sensitivity to gain – ecosystem credit species (based on the species with the highest sensitivity impacted by the development, or biodiversity certification			
Sensitivity to loss – ecological communities and PCTs	Very high sensitivity (x's 3)	High sensitivity (x's 2)	Medium sensitivity (x's 1.5)	Low sensitivity (x's 1)
CEEC or a PCT ≥90% cleared Very high sensitivity (3)	3	2.5	2.25	2.0
EEC or a PCT ≥70% – <90% cleared High sensitivity (2)	2.5	2.0	1.75	1.5
VEC or a PCT ≥50% – <70% cleared Moderate sensitivity (1.5)	2.25	1.75	1.5	1.25
PCT <50% cleared Low sensitivity (x'1)	2.0	1.5	1.25	1

Stewardship credit generation:

- Management gain
- Active restoration
- Averted loss
- Security Benefit

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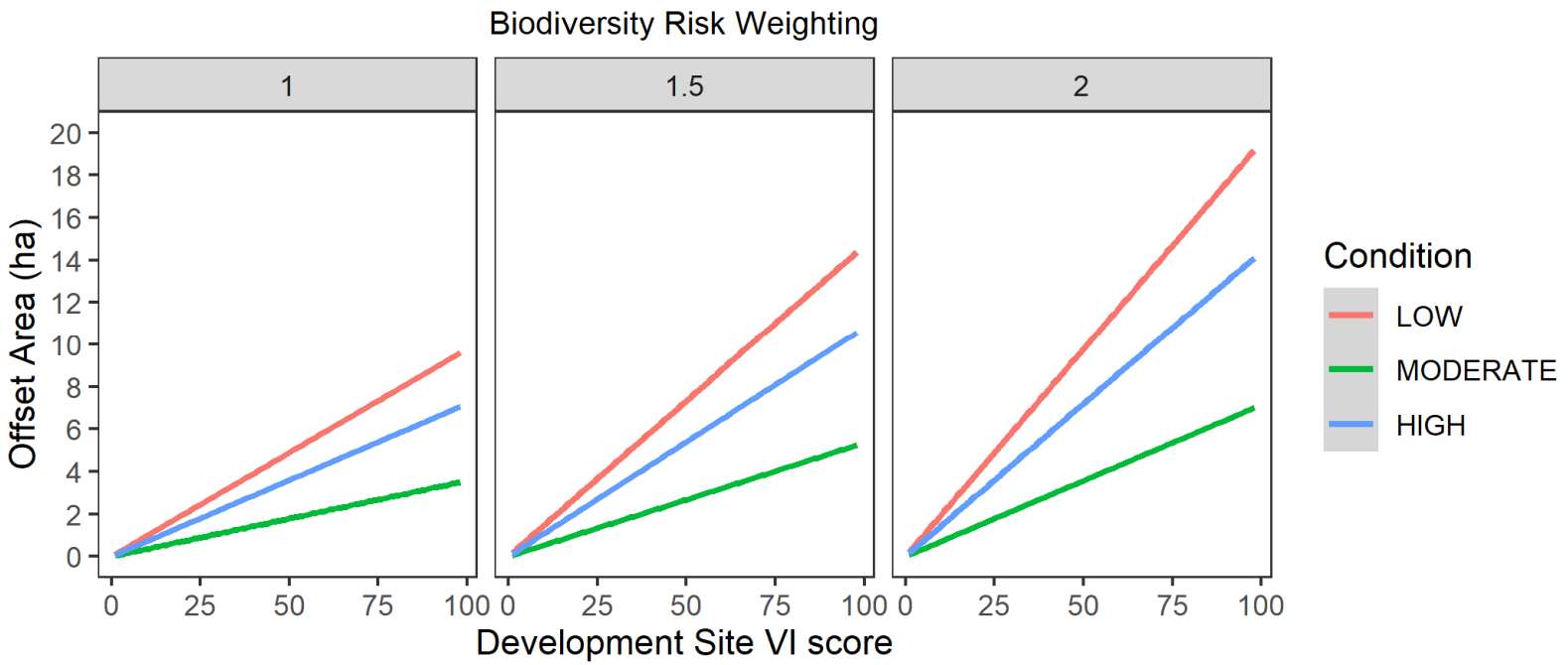
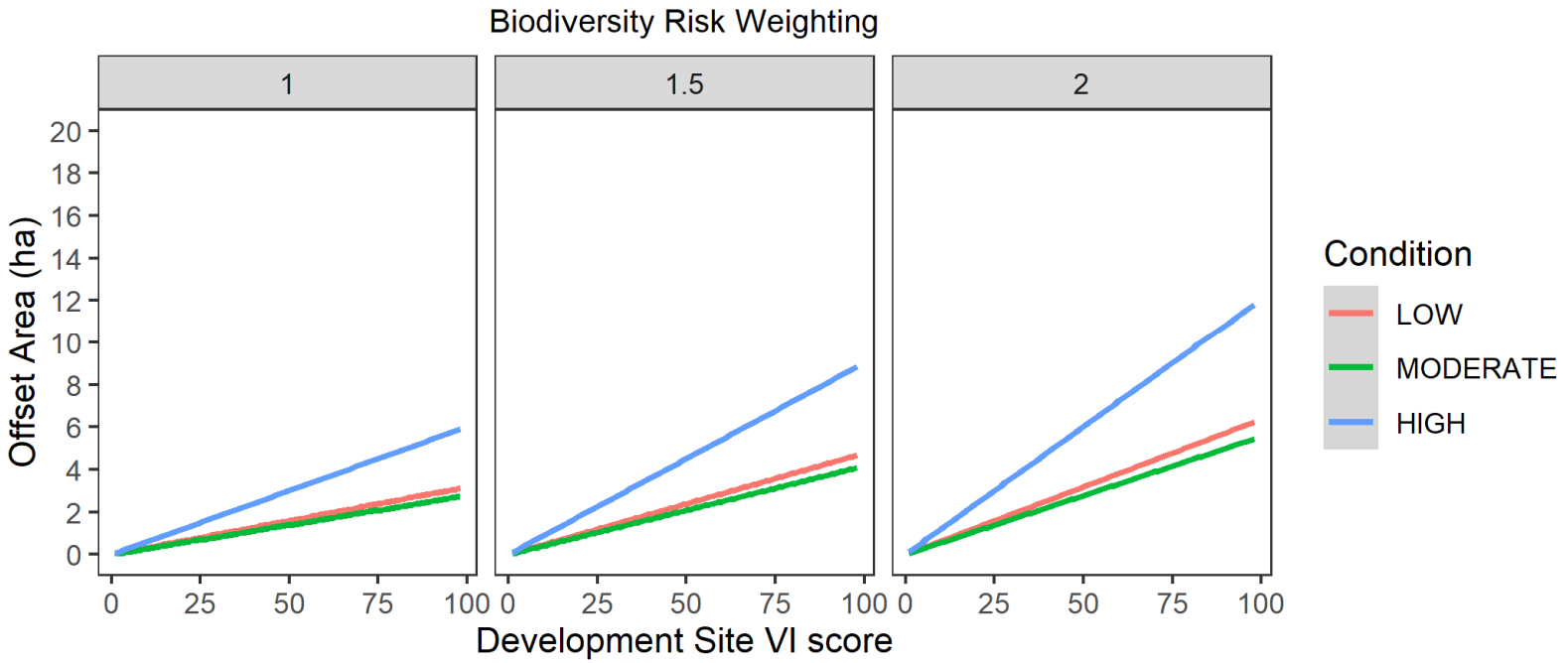
Offset Area – Management of threats and pressures



HTW = 0%; Landscape Vegetation Cover = 50%

Offset Area – Active restoration

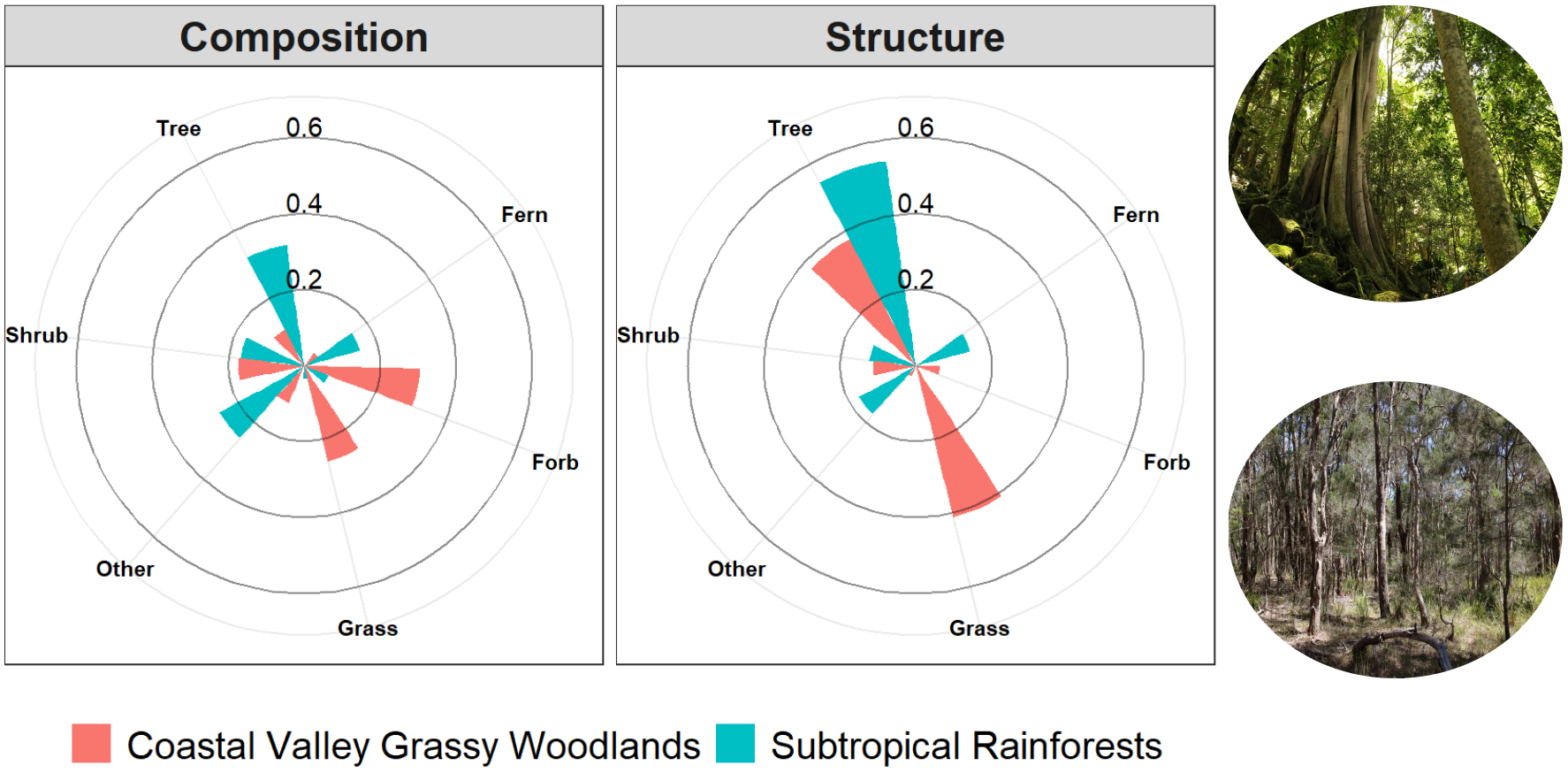


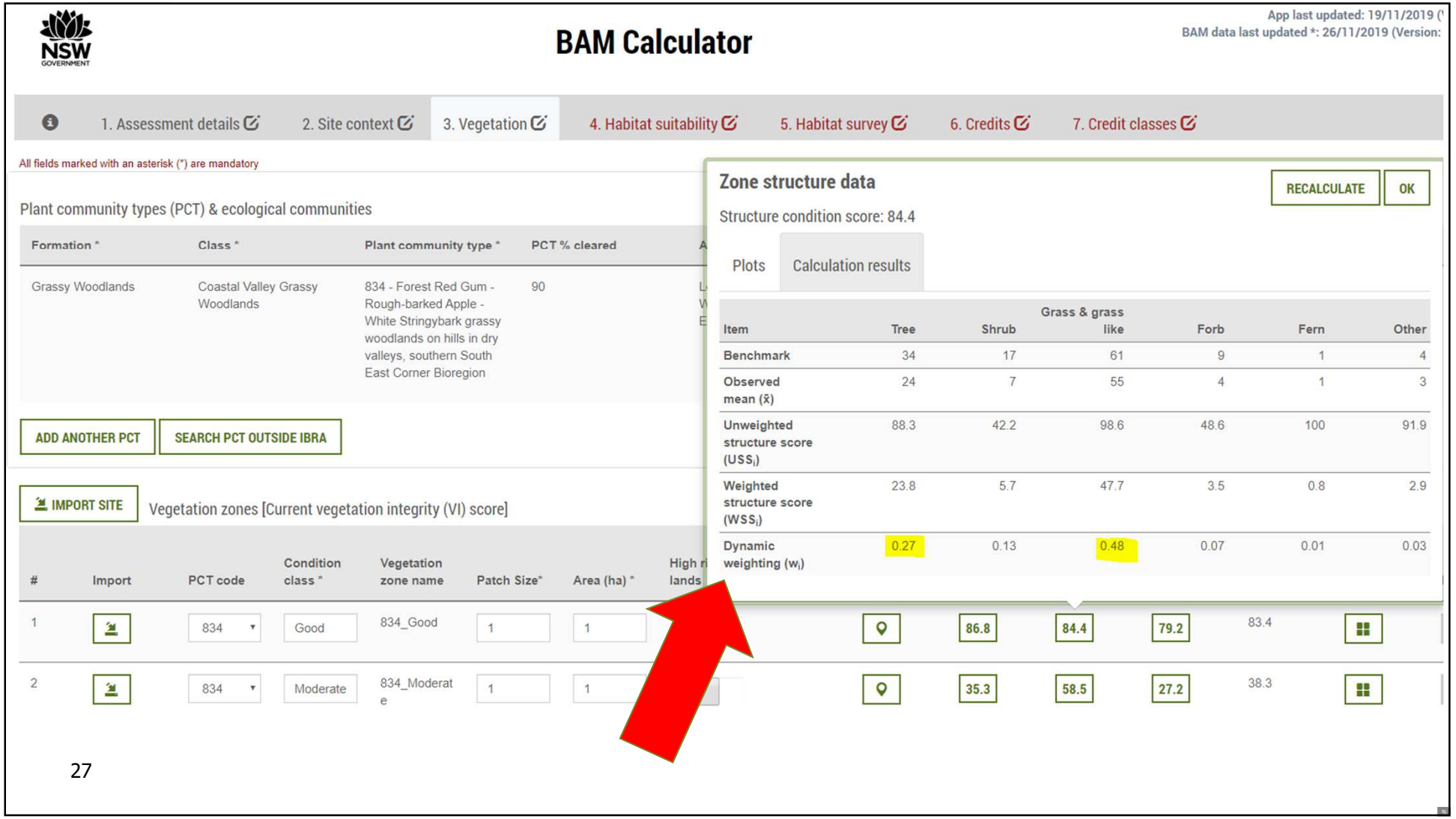
HTW = 0%; Landscape Vegetation Cover = 50%

Unpacking it further – Vegetation Integrity

- Dynamic weighting
- Non-linear transformation to generate attribute scores

Importance of dynamic weighting




BAM Calculator
App last updated: 19/11/2019 (
BAM data last updated *: 26/11/2019 (Version:
1. Assessment details
2. Site context
3. Vegetation
4. Habitat suitability
5. Habitat survey
6. Credits
7. Credit classes
All fields marked with an asterisk (*) are mandatory
Plant community types (PCT) & ecological communities
Formation *
Class *
Plant community type *
PCT % cleared
Grassy Woodlands
Coastal Valley Grassy Woodlands
834 - Forest Red Gum - Rough-barked Apple - White Stringybark grassy woodlands on hills in dry valleys, southern South East Corner Bioregion
90
ADD ANOTHER PCT
SEARCH PCT OUTSIDE IBRA
IMPORT SITE
Vegetation zones [Current vegetation integrity (VI) score]
Import PCT code Condition class * Vegetation zone name Patch Size* Area (ha) *
1 834 Good 834_Good 1 1
2 834 Moderate 834_Moderate 1 1
Zone structure data
RECALCULATE
OK
Structure condition score: 84.4
Plots
Calculation results
Item Tree Shrub Grass & grass like Forb Fern Other
Benchmark 34 17 61 9 1 4
Observed mean (x̄) 24 7 55 4 1 3
Unweighted structure score (USSi) 88.3 42.2 98.6 48.6 100 91.9
Weighted structure score (WSSi) 23.8 5.7 47.7 3.5 0.8 2.9
Dynamic weighting (wi) 0.27 0.13 0.48 0.07 0.01 0.03
86.8 84.4 79.2 83.4
35.3 58.5 27.2 38.3
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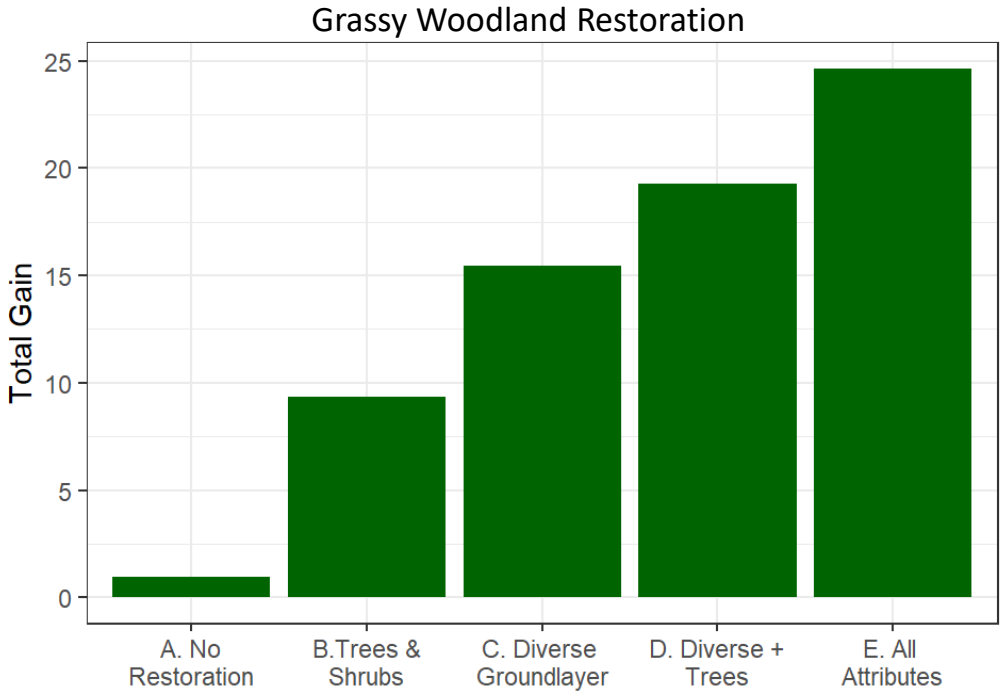
Active restoration and dynamic weights



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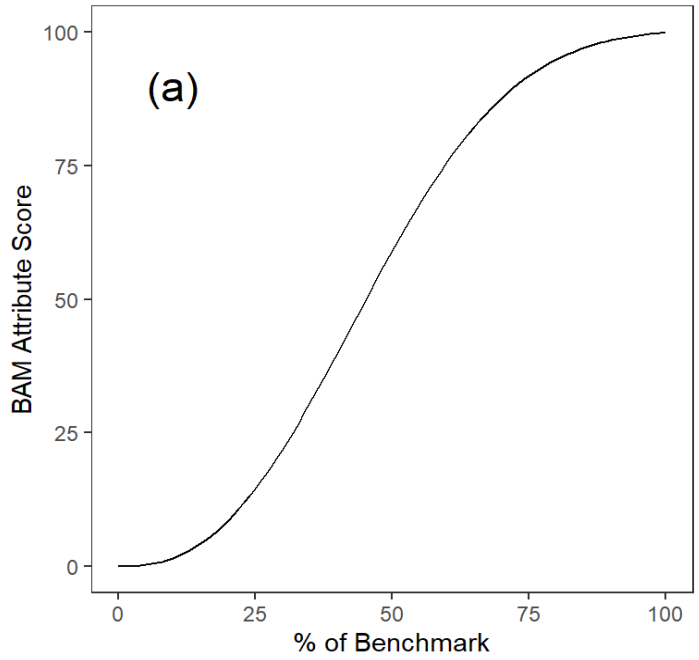
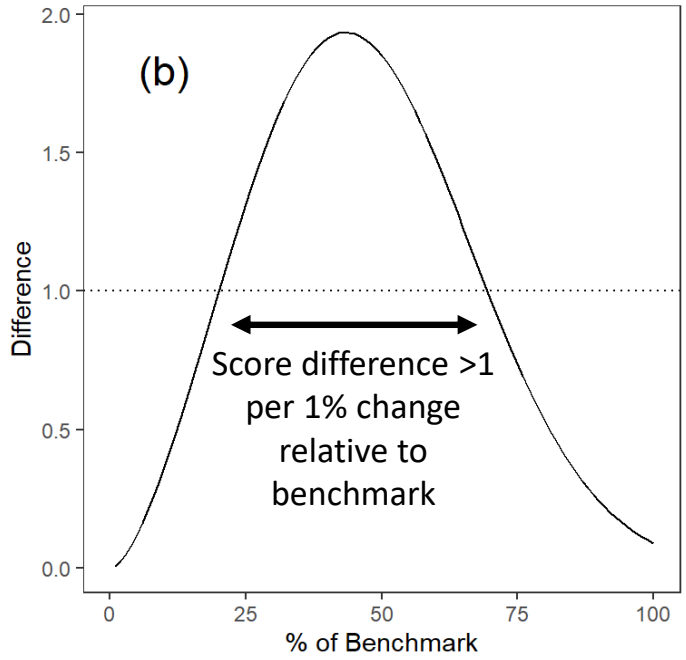
BAM uses a non-linear transformation to convert attribute values into a score (n/100)





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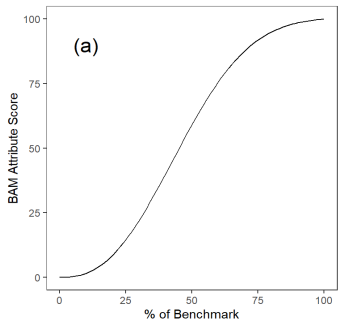
Non-linear transformation and logistic rate of increase – combined effect



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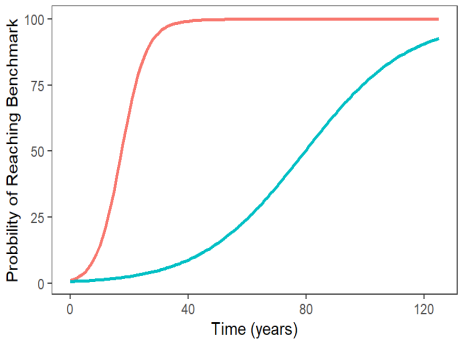
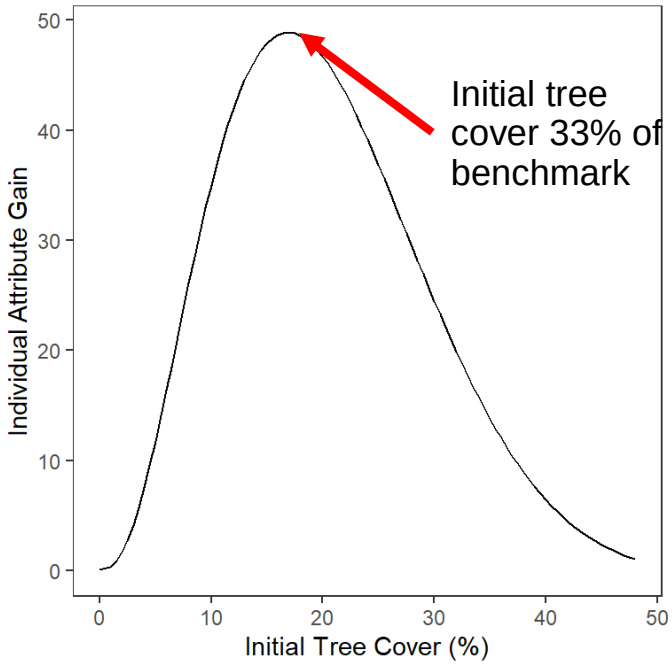


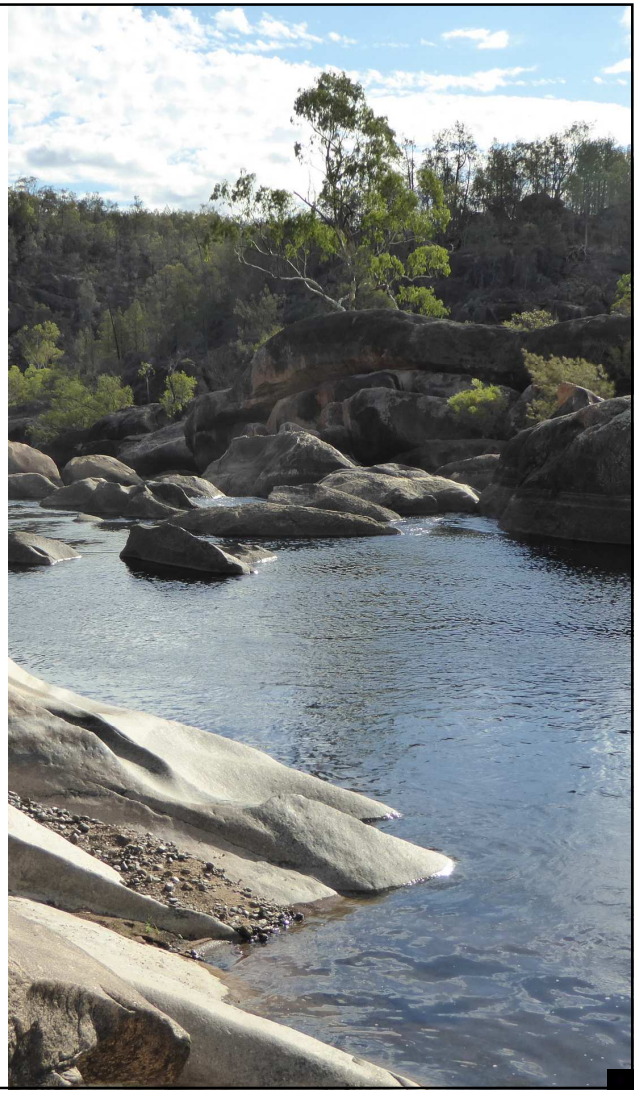
Tree cover



Before dynamic weighting
HTW = 0% and Landscape Vegetation cover = 50%

Outperforming sites and re-assessment

- Some stewardship sites may outperform expectations
- Previously there was no capacity to support on-going improvement
- Re-assessment aims to reward good outcomes
- Long-term potential to supply credits prior to losses occurring.



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Summary

- Biodiversity credits from offsets are derived from gains NOT current values
- Management of threats and pressures results in greatest gains when sites have:
  - Moderate starting VI scores
  - Most attributes at ~20% - 70% of their benchmark
  - High threat weed cover is low
  - Landscape vegetation cover is >30%

Summary

- Without active restoration, low condition sites are a poor investment
- Active restoration can substantially increase gains and credits
- Gain is maximised if attributes are targeted that have highest dynamic weights
- Biodiversity risk weightings and development site VI have **very large** impacts on offset ratios
  - avoiding high risk weightings & good condition sites will substantially reduce credit requirements


NSW
GOVERNMENT


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Q&A
This session will not be included in the webinar recording.
Written questions and answers will be attached to the webinar recording soon after the event.
Questions asked during these webinars also contribute to the development of the Assessor Q&A page, future webinars and other Biodiversity Offsets Scheme supporting resources.

Thank you for your participation

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Contact us at www.environment.nsw.gov.au/biodiversity/bos-help-advice