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& Environment

Demystifying carbon projects: Human-induced Regeneration (HIR)

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Integrity Ag and Environment

Who are we?

Integrity Ag & Environment

- Specialist in agri-environmental consulting with offices in QLD, NSW, WA.
- Carbon and biodiversity baselines.
- ERF project development.
- Across all major ag industries

Agenda

1. Overview of the current HIR market
2. Unpack the method
   - Key requirements
   - Baseline forest cover
   - Assessing forest potential
   - Potential ACCU returns and costs
3. Key risks to consider
4. Project life cycle
5. Decision support tools

But first… the jargon

Additionality:
Unlikely to otherwise occur in the ordinary course of events

Forest Potential:
Areas which are likely to grow into a Forest within 15 years

FullCAM: Full Carbon Accounting Model. Aust. Gov. sequestration modelling software which calculates sequestration, and project emissions

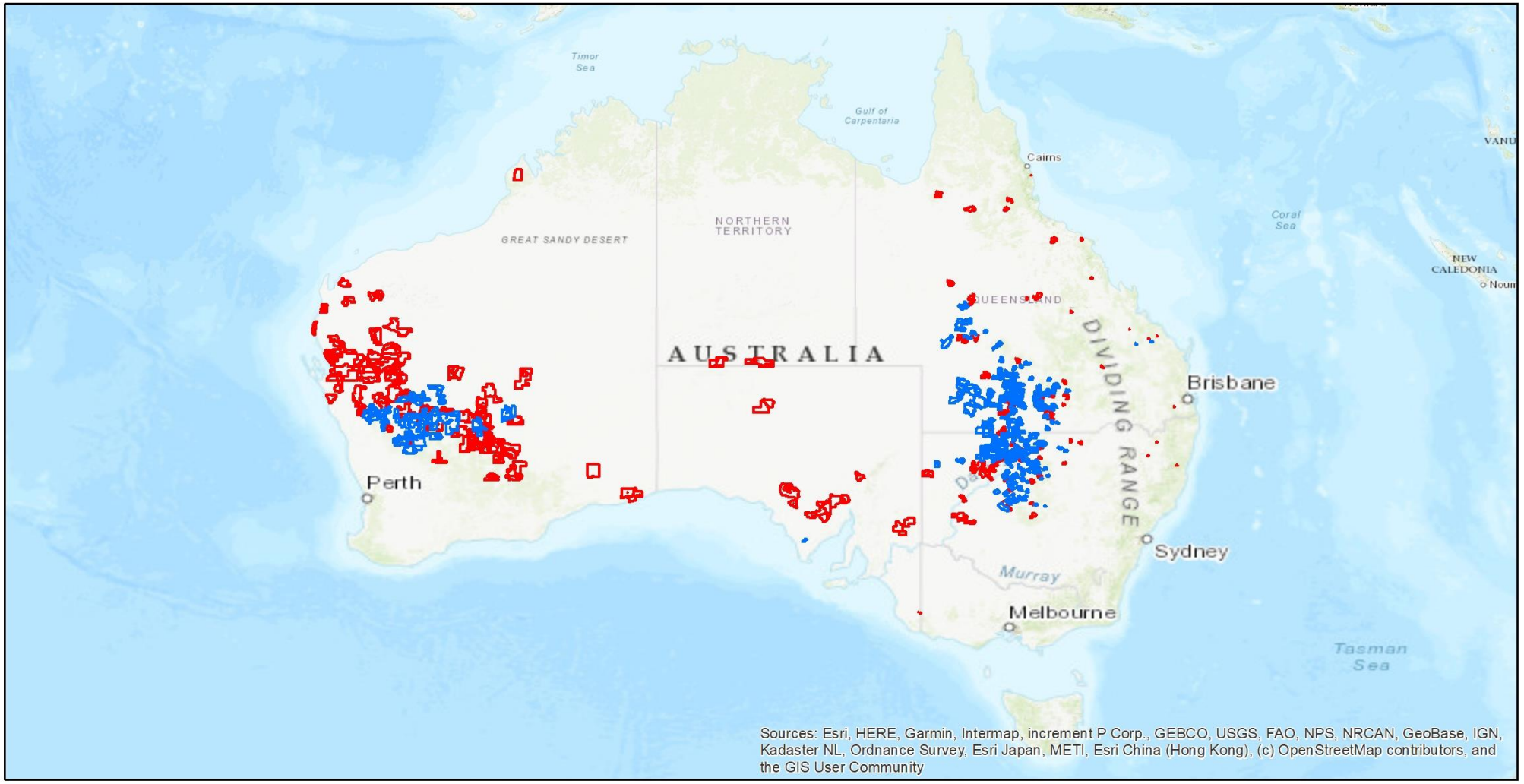
Carbon Estimation Areas:
Areas where the project mechanism is being implemented and where credits are generated

Forest: Native woody vegetation high than 2m and greater than 20% canopy cover

Future Forest Potential:
Areas which are eligible but not currently showing forest potential

National HIR Market

Registered HIR project boundaries



HIR Projects with ACCUs Issued

HIR Projects

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Date: 6/10/2022

N

0 270 540 810 1,080 1,350 km

Projecton: GCS GDA 1994

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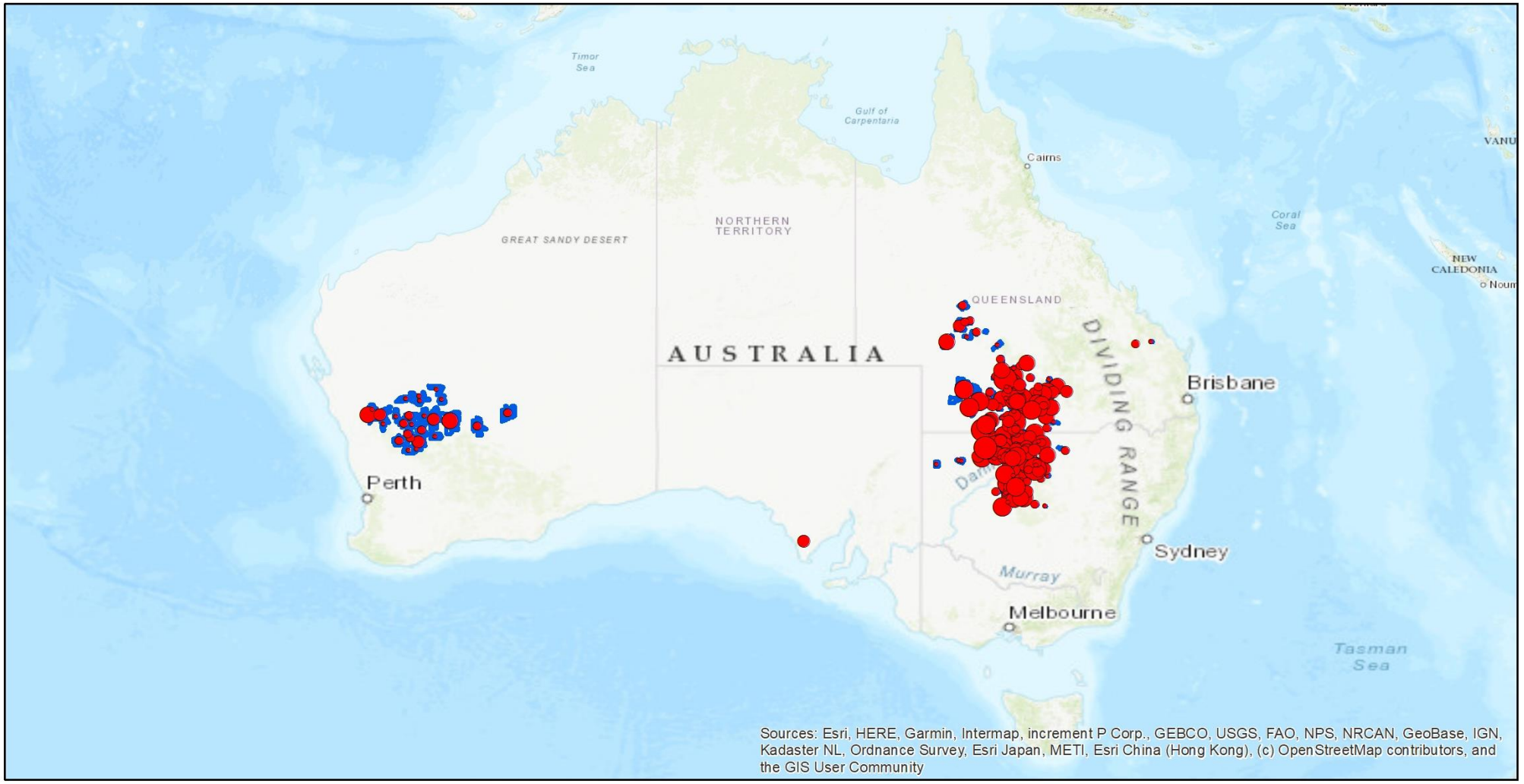
National HIR Market

Registered HIR project boundaries which have yielded credits



Total HIR ACCUs Issued

- 7 - 44,799
- 44,800 - 96,449
- 96,450 - 156,039
- 156,040 - 247,912
- 247,913 - 439,268
- 439,269 - 1,087,382

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N

Date: 6/10/2022

0 270 540 810 1,080 1,350 km

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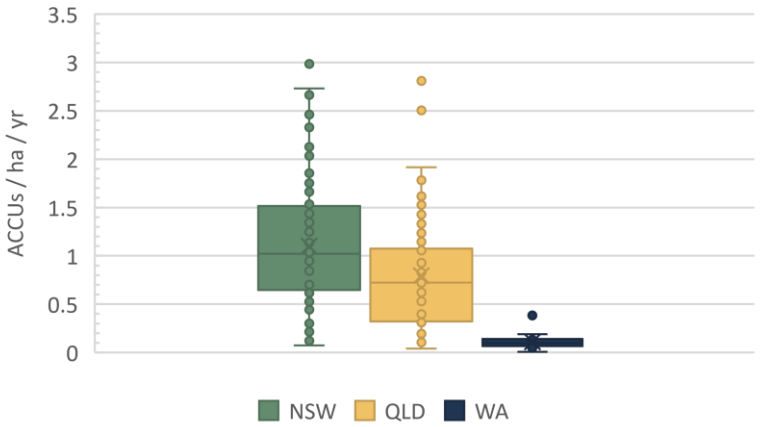
HIR Market Statistics

(as of Sep 2022)

- 370 active projects nationally covering 30M ha
- 221 projects have been issued ACCUs to-date
- 6.4M ACCUs issued FY21/22 (Approx $192M value assuming $30/ACCU)
- Yield's averaging 1 ACCU/ha/year for 25 yrs against project areas[1]

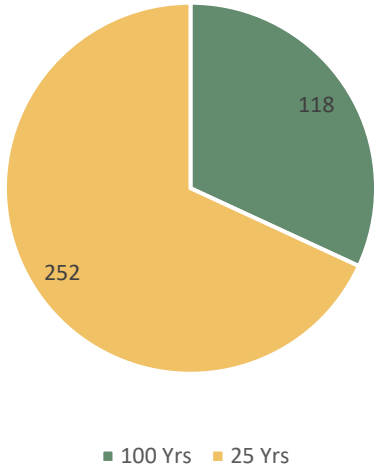
HIR ACCUs Actual Project Yields



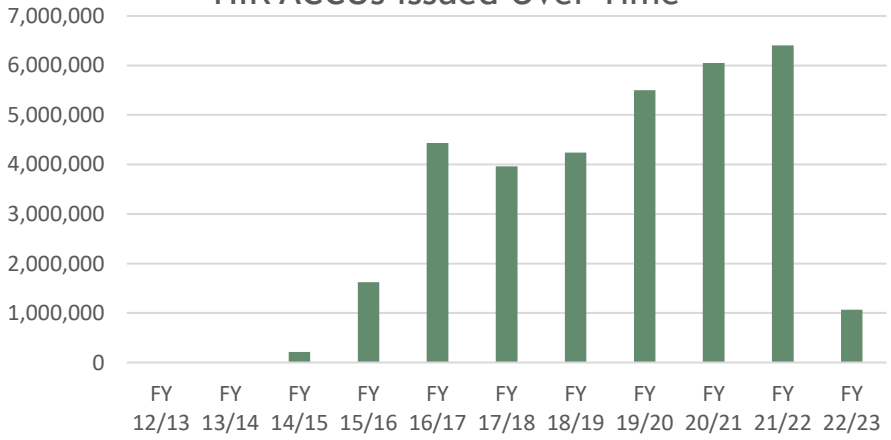
n=221, NSW μ' = 1.1, QLD μ' = 0.8, WA μ' = 0.1

[1] Yields have been annualised by averaging over the length of the time the project has been active, against the registered project area (not the CEA area)

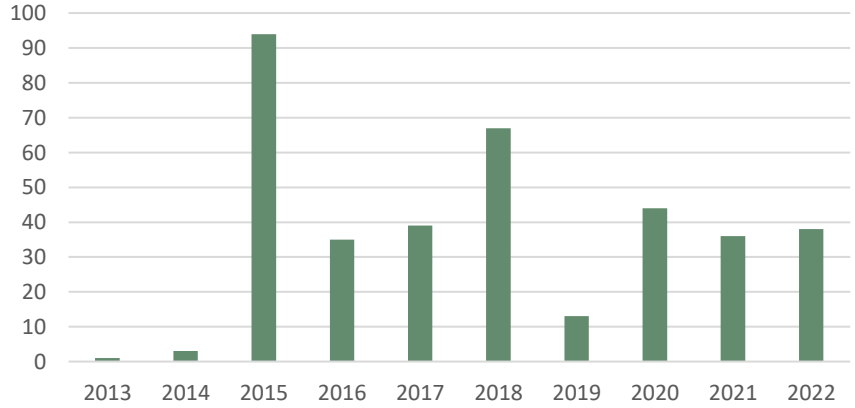
HIR Project Permanence



HIR ACCUs Issued Over Time



HIR Project Registrations Over Time



Case Study Introduction

- Melinee Leather
- “Hazeldean” 3,690 ha
- 140 km west of Bundaberg
- Historical land management her perspectives

StudyArea

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Project ID: 1126
Date: 10/11/2022

N

0 0.6 1.2 1.8 2.4 3 km

Projecton: GDA 1994 MGA Zone 56

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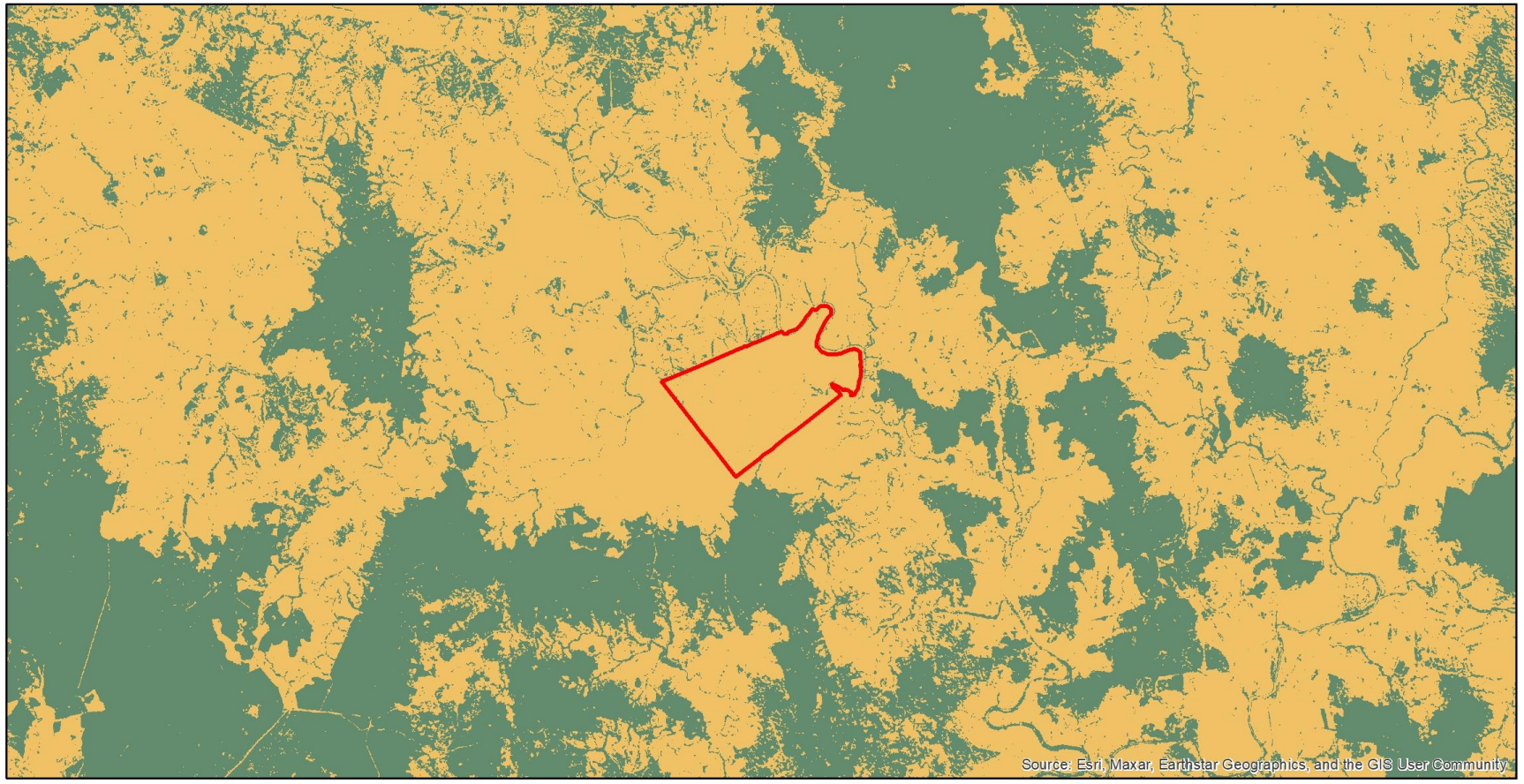
Key Requirements

- Fundamentally about enabling regeneration
- Through ‘additional’ and ‘new’ land management activities
- Taking land from ‘**Forest Potential**’ to ‘**Forest**’ within 15 years
- Baseline Forest excluded. Suppression evidenced.
- Land management (or HIR) activities may include: grazing exclusion, strategic grazing, ceasing clearing, pest and weed management

Baseline Forest Cover



Study Area
Less than 20% forest cover
Pre-existing baseline forest cover (excluded)

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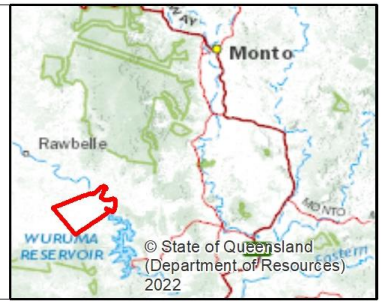

Project ID: 1126
Date: 29/11/2022

N

0 2.4 4.8 7.2 9.6 12 km

Projecton: GDA 1994 MGA Zone 56

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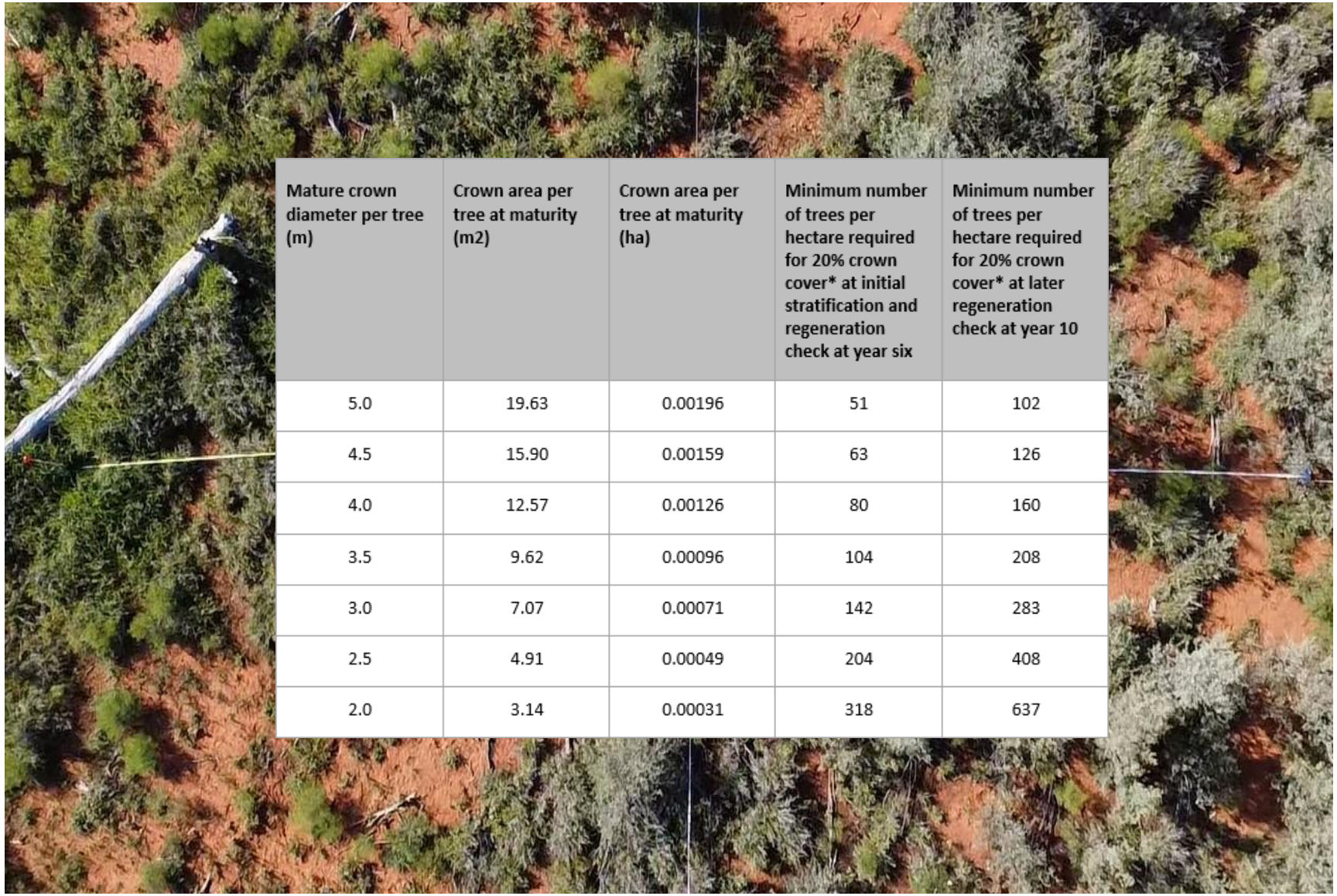
- Pre-existing Forest during a 10 year baseline is required to be excluded
- Specifically any area that exhibited > 20% canopy cover and > 2m of native woody vegetation
- Typically assessed using the National Forest and Sparse Cover mapping (1988 – 2021) derived from Landsat imagery
- Confirmed through on-ground assessments

Forest Potential

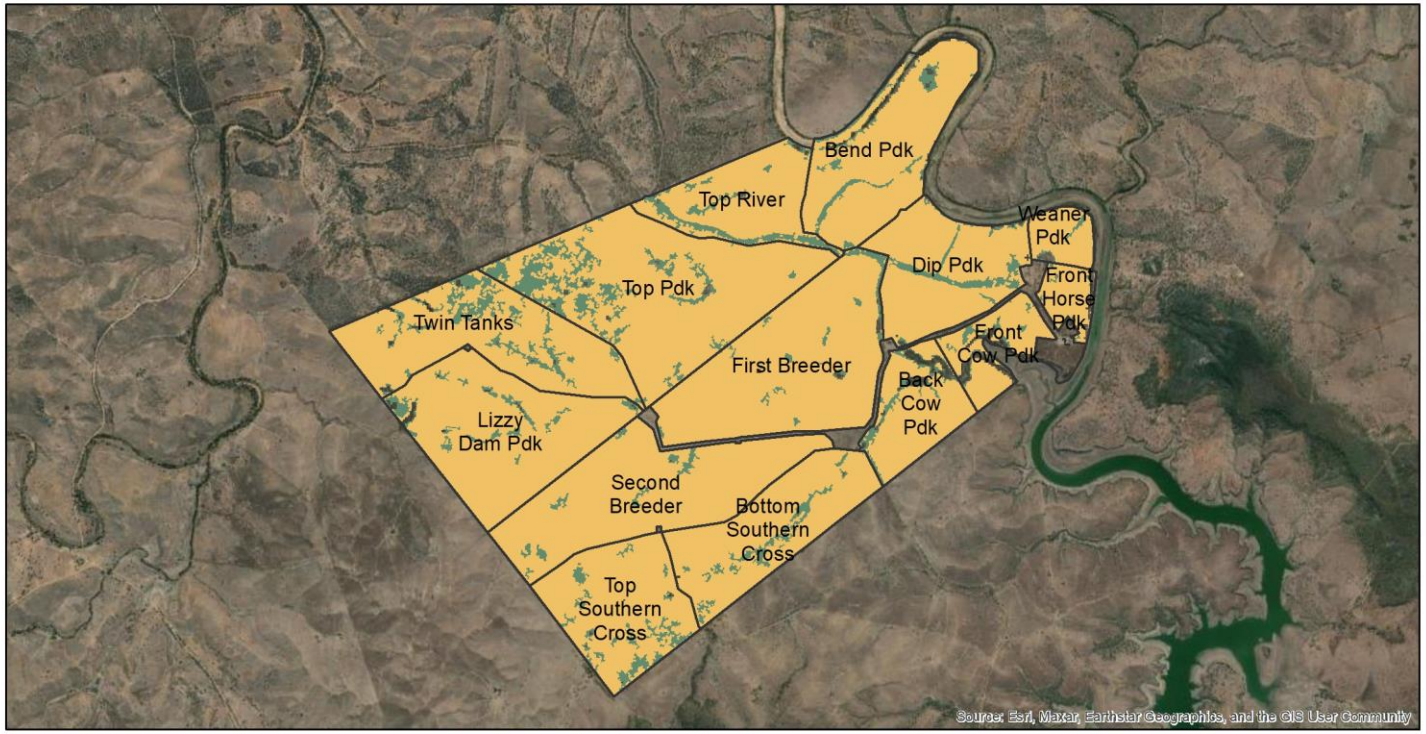


Mature crown diameter per tree (m)	Crown area per tree at maturity (m2)	Crown area per tree at maturity (ha)	Minimum number of trees per hectare required for 20% crown cover* at initial stratification and regeneration check at year six	Minimum number of trees per hectare required for 20% crown cover* at later regeneration check at year 10
5.0	19.63	0.00196	51	102
4.5	15.90	0.00159	63	126
4.0	12.57	0.00126	80	160
3.5	9.62	0.00096	104	208
3.0	7.07	0.00071	142	283
2.5	4.91	0.00049	204	408
2.0	3.14	0.00031	318	637

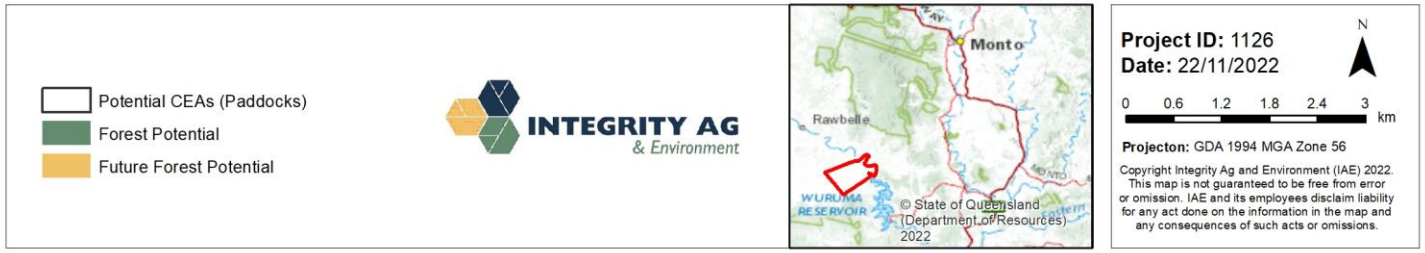
- For a CEA to have forest potential, at the time of its stratification, it must have sufficient trees (including seedlings and saplings) and these must have the potential to reach two metres or more in height with at least 20 per cent crown cover across the CEA

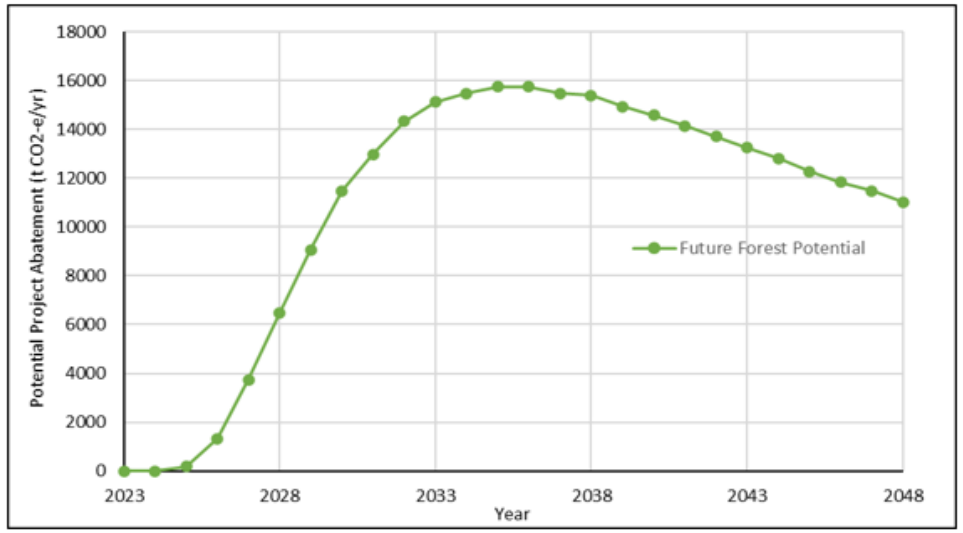
- Put another way it can't be a Forest, but it needs to have stem densities on the ground to grow into a Forest within 15 years (with management intervention)

Potential Returns



Parameters	Forest Potential (5%-19%)[1]	Future Forest Potential (<5%-19%)[2]	Totals
Potentially eligible area (ha)	296	3,235	3,531
Average annual per ha estimate (t CO2-e/ha/yr)	6.4	4.7	n/a
Estimated sequestration potential per ha for 25 years after deduction for 25-yr permanence (t CO2-e/ha)	122.5	87.4	n/a
Annual estimated sequestration potential after deduction for 25-yr permanence (t CO2-e, i.e. ACCUs)	1,428	11,305	12,733
Total estimated sequestration for 25-year period (t CO2-e, i.e. ACCUs)	**35,694**	**282,634**	**318,328**





Key Risks to Consider

- long term grazing capacity including assessing the change from the current state to a regenerated state assume that these areas will not be permitted to be cleared in the future.
- Potential impacts on land value
- Diminishing economic returns. HIR projects return a yield for 25 years only (the crediting period)
- Regeneration checks and fire risk
- Cost of inaction? Market access? Typically 3 years for regeneration projects to begin yielding credits

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Human Induced Regeneration
Project Life Cycle

A typical FullCAM sequestration curve for Human Induced Regeneration

Project Registration

Yr 6
Initial Stratification
First offset report
External Audit 1 of 3
Regen check 1

Yr 10
Regen check 2

Yr 15
Forest Attainment Date
(15 yr's from model commencement date)
Regen check 3

2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047

Yr 1 Yr 5 Yr 10 Yr 15 Yr 20 Yr 25

Regeneration checks
- Completed by remote sensing
- A proportion of the CEA must have attained Forest Cover
- Nominally 7.5% at Yr 6, 10% at Yr 10, 20% at Yr 15

Pre-registration
- Notification requirement > 1/3 of property
- Feasibility assessments (desktop + on-ground)
- Exclusion of baseline cover (10 Yrs prior to registration)

Initial stratification
- Significant on-ground vegetation survey effort mapping vegetation communities, stem density and determining age class (to establish model commencement dates for CEAs)
- Areas not demonstrating Forest Potential are excluded
- Can occur straight away or wait up to 6 years for areas to demonstrate Forest Potential
- Offset reports and credits commence
- Secondary stratifications may be required if CEA's fail regeneration checks at years 10 and 15

Crediting period
(25 yrs)

Reporting period
(6 months – 5 years)

External Audits
- A minimum of 3 per project
- First audit is due with the first offset report
- CER will issue audit schedule upon registration
- Additional audits at the discretion of the CER including where the report for a period claims more than 100 000 t CO2-e of abatement.

Permanence period
- 25 - 100 years
- Risk of reversal reduction in ACCUs is 25% for a 25 yr project or 5% for a 100 yr project

Decision support tools

LOOC-C

Human-induced regeneration of a permanent even-aged native forest

Vegetation method

Benefit type	Rating
LRF co-benefits	■■■■■
Farm co-benefits	■■■□□

25 year estimate over the whole project area (tCO2-e): **860,803**

Annual per ha estimate (tCO2-e/ha/y): **1.2**

Seek further information and advice regarding the operation of this method at this location.

Digital Agricultural Services (DAS)

Property Benchmark Report

MyFarmKey

Verify your farm boundary in a few minutes;
Analyse 30 years of satellite data;
Benchmark ground cover and woody vegetation change
NEW - Generate a forest carbon report for your farm

MyFarmKey App | MyFarmKey User Guide

- In order to estimate the baseline forest cover for a property use an online tool for example Digital Agricultural Services or Cibo labs MyFarmKey.
- CSIRO's LOOC-C tool can then provides a reasonable maximum HIR sequestration estimate for a given area. Ensure you discount the area using your baseline forest cover figure.
- Note that this will be a maximum figure. Actual eligible areas will likely be less than this and contingent on the presence of Forest Potential.

More information?

Clean Energy Regulator – HIR Information

https://www.cleanenergyregulator.gov.au/ERF/Choosing-a-project-type/Opportunities-for-the-land-sector/Vegetation-methods/Human-Induced%20regeneration%20of%20a%20permanent%20even-aged%20native%20forest

CSIRO landscape options and opportunities for carbon abatement calculator

https://looc-c.farm/introduction

Digital Agricultural Services Platform

https://digitalagricultureservices.com/platform

Cibolabs myfarmkey

https://www.cibolabs.com.au/products/myfarmkey

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