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The Carbon Market Institute (CMI) thanks the Environment and Communications Legislation Committee for the opportunity to present the at the public hearing on Monday, 27 February 2023 for the Senate Inquiry into the Safeguard Mechanism (Crediting) Amendment Bill 2022. We were surprised to realise that though critics of the ACCU crediting scheme and Chubb Review process were given opportunities to present, neither Professor Chubb nor other members of the Review Panel appeared as witnesses.

During Monday's hearing, CMI spoke briefly about the importance of the Chubb Review recommendations which we firmly believe, if implemented appropriately, will enable transparency such that those with evidence of overabatement will be able to trigger appropriate responses from the Clean Energy Regulator. It is important to note that the Wentworth Group and the Australian Academy of Science have subsequently supported both the findings and the recommendations of the Review Panel.

CMI produced a market brief on the Chubb Review findings and recommendations, available here. This includes links to the statements of the Wentworth Group and the Australian Academy of Science, as well as evidence presented to the Chubb Review by CMI members Climate Friendly and AI Carbon. This evidence was important to the Review Panel's findings that they did not believe there was over-crediting of abatement. Neither Climate Friendly nor AI Carbon had an opportunity to present evidence to the Senate Committee's public hearings.

I have attached the full submission of Climate Friendly to the Chubb Review for further information of the Committee and encourage its consideration, noting this is their submission and evidence from their projects. Any questions on this submission should be directed to Climate Friendly.

Should you have further questions for CMI, please do not hesitate to contact us.

Submission: Independent Review of Australian Carbon Credit Units September 2022

About Climate Friendly

Founded in 2003 by a CSIRO scientist, Climate Friendly is a profit-for-purpose company with a vision for a productive, sustainable land sector that contributes to a zero net emission Australia by 2050. We achieved our first target to support 20 million tonnes of greenhouse gas reductions at the end of 2020, and our purpose is to scale up to 100 million tonnes by 2025. We are one of the longest operating and most experienced carbon extension service providers in Australia. Our growing team of 65+ expert staff has supported registration of over 150 carbon projects since 2014. We partner with agricultural producers, foresters, Traditional Owners, conservation organisations and governments to design and implement these projects across approximately 10 million hectares of land.

Climate Friendly welcomes the opportunity to provide a submission to the Independent ACCU Review. A high-integrity carbon crediting framework is critical to meeting and beating Australia's emissions reduction goals and transforming the way land is managed in Australia. This transformation is essential to draw carbon down from the atmosphere to achieve net negative emissions and limit global warming to 1.5C, increase sustainable food production to feed a growing global population and reverse biodiversity loss.

Our experience with the Emissions Reduction Fund (ERF)

Climate Friendly has supported registration of more than 150 carbon farming projects under seven different land sector methods (human-induced regeneration, avoided deforestation, savanna burning, soil carbon, plantation forestry, environmental plantings and beef herd management). As part of our carbon farming extension services, we have obtained 285 eligible interest holder consents (91 banks, 97 government, 19 native title holder and 78 other). We have worked with partners on each of these projects to prepare property management and project permanence plans, including coverage of fire management.
We conduct quarterly monitoring on each of the projects that we support to collect time-series, third party auditable data on project implementation. We have completed 109 independent project audits with 12 different audit companies who are registered under National Greenhouse and Energy Reporting Scheme (NGERS). We submitted more than 1000 offsets reports, which include review against our internal quality assurance processes, and more than 1000 associated applications for ACCU issuance to the Clean Energy Regulator. We have submitted more than 50 first regeneration checks for human-induced regeneration projects that we support. We invest deeply in technological innovation to continuously improve precision of measurement and monitoring, while driving down costs.

Part 1: Governance of the carbon farming framework

Climate Friendly's role in these carbon farming collaborative partnerships is to bring together the complete package of expert skills and extension services needed to run a high integrity, high impact carbon project. Our goal is to make it easy for our partners to continue to focus on their passion and expertise in managing land for agricultural production or conservation or both, while we advise and enable them on how to participate in carbon farming and optimise their land management to deliver a suite of other environmental, cultural, agricultural productivity, economic and social benefits.

Best practice management of ecosystems and high integrity carbon farming necessarily requires expertise. Below is a non-exhaustive example of the package of expertise that Climate Friendly brings together for our partners. Each project we support has one main point of contact to streamline and integrate services and information for our partners. Behind the scenes, that contact person is supported by a team of people with diverse skills delivering the full package of expertise that are required. It is unrealistic and undesirable for most land managers to develop the full set of necessary capabilities outlined in the below table. While it is an option to outsource specific tasks to different consultants, this requires significant project management and typically comes at a higher cost. There is also greater risk that different service providers advice will not be coordinated, leading to sub-optimal outcomes.

Table 1: Expertise & Services required to support a high integrity land based carbon farming project		
	Services & Expertise	**Typical services provided by Climate Friendly as part of carbon project**
1	Ecology	Carbon projects require considerable knowledge of the environment and how it will respond to changes in land management. This requires extensive environmental expertise that is combined with knowledge of the evidence required by auditors and the Clean Energy Regulator (CER). Without understanding the ecology, a land manager will have limited ability to identify suitable land management practice changes that will lead to carbon storage or avoidance of emissions.
2	Agronomy & Forestry	Carbon projects are often operated on productive agricultural properties. To deliver the ecological and carbon benefits without adversely impacting agricultural production requires expertise in agronomy to be combined with ecology and carbon expertise. Climate Friendly has a team of people with grazing, cropping and forestry expertise that is applied in tandem with ecological expertise. This enables better choices on how to optimise agricultural productivity as part of carbon farming management changes, or informs land managers where trades offs might be required.
3	Modelling & data science	Operating a carbon project requires carbon, environmental and financial modelling expertise. Climate Friendly has a team of modelling and data science experts that manage complex timeseries datasets and model carbon abatement and other scenarios. This skill is necessary to pass project audits and submit applications for ACCUs, as well as informing initial decisions about whether or not a project is feasible to implement for a carbon, environmental and commercial perspective.
4	Geospatial mapping	Most land based carbon methods require substantial mapping expertise to determine eligibility and monitor project impact. Climate Friendly has a team of GIS experts for these tasks and has invested deeply in emerging technologies and automated mapping systems, which would not be feasible to invest in at an individual project scale. This includes both the acquisition of suitable remote sensing data from satellites, planes, drones, and advance technology that enables us to integrate this with field data sets.
5	Regulatory compliance & other legal services	Operating a carbon project is generally a once in a lifetime process for land managers. To do so successfully requires compliance with a broad range of complex laws including: CFI Act, CFI Rule, CFI Regulations, Methods, Technical Guidelines, Native Title Act, national tax laws, financial services legislation, multiple state and territory laws relating to land management. And the legal requirements often change through time, such as after government reviews. An in depth and current understanding of all these requirements, and how they apply to a specific property is required to deliver a carbon project that is eligible to access carbon credits over time. The ability of individuals to consistently meet these legal requirements, without expert advice, is likely low.
6	Traditional Owner partnerships	Establishing a carbon project can often involve the need to establish and maintain a partnership with Native Title holders or other Traditional Owner partners. In our experience, new relationships with a Native Title or Traditional Owner group can take 2-4 years to establish and follow best practice consultation, consent and partnership establishment processes while observing cultural protocols. These partnerships commonly require significant ongoing engagement to maintain productive, two-way relationships. Many projects would not be able to proceed without successful establishment of such partnerships, and this is commonly outside of the expertise of most land managers, many of whom have limited time to invest in these partnerships at conception. These partnerships also provide important opportunities for two-way learning, sharing of Traditional knowledge and furthering reconciliation.
7	Audit and assurance	Carbon projects require extensive pre-feasibility assessments prior to registration to ensure they are viable for all partners, and once registered they require multiple audits across their life and ongoing quality assurance. This is a key integrity requirement. These audits are expensive and time-consuming processes to manage. Climate Friendly undertakes full feasibility assessments on each prospective project to determine its viability, or inform land managers that their property does not meet eligibility requirements. These assessments are screened by an internal Technical Review committee before we recommend a project is eligible to proceed to registration. Further, we pre-audit land management records, compile audit packs and manage independent auditor's information requests throughout each external audit, which typically involve detailed technical questions and responses.

Table 1: Expertise & Services required to support a high integrity land based carbon farming project		
	Services & Expertise	**Typical services provided by Climate Friendly as part of carbon project**
8	Project management	Operating a carbon project is a substantial logistical and project management exercise. The coordination of the range of expertise required to achieve a successful carbon project is substantial. Climate Friendly have a team of project managers who ensure each land manager's project meets required milestones and underpinning data requirements. This is delivered in a seamless fashion through each carbon project having a dedicated project manager that is their primary point of contact.
9	Financial services	Australian Carbon Credit Units (ACCUs) are financial products. This means that land managers require advice to inform their decisions to trade, hold or voluntarily retire ACCUs generated from their projects. Climate Friendly holds an Australian Financial Services Licence (AFSL) which enables us to provide market advice to our clients.
10	Research & development (R&D)	Climate Friendly is constantly investing in R&D, to improve project services for our partners and ensure they are informed by the latest science, advance industry best practice, accelerate climate action and optimise land management. This includes through key partnerships with CSIRO, Bush Heritage Australia, WWF Australia, The Mulloon Institute, NSW Government, QLD Government, UNSW and Charles Sturt University among others. Examples of our R&D investment include piloting a holistic approach to carbon farming with Bush Heritage Australia which is now informing the design of a new Integrated Farm Management (IFM) method, development of an Integrated Native Vegetation Condition (IVC) method that has been approved by Accounting for Nature. The IVC enables dual monitoring of carbon and biodiversity when coupled with IFM. We are also well progressed in the development of a drought resilience standard. Over 15% of Climate Friendly's expert staff have a dedicated focus on R&D, with all staff having opportunities to participate in specific R&D projects.
11	Government relations	Climate Friendly manages the relationships with the Clean Energy Regulator and a wide array of other government bodies at the state and federal levels. This includes day to day project management, as well as broader engagement on government policies that relate directly and indirectly to carbon farming, including government reviews and submissions such as this one. A part of the focus of this engagement is expanding opportunities to deliver climate impact on the ground and ensuring government policies are "implementation-ready" and address existing barriers to implementation and participation.
12	Capital investment	Climate Friendly provides significant upfront investment to get carbon projects up and running. Our standard model is that we don't get paid until our project partners generate ACCUs. The time between initial feasibility assessment to first issuance of ACCUs is typically a minimum of 18+ months. It requires significant investment in field work, mapping and data collection such as drone plots or aerial lidar, preparation of various applications, obtaining consents and payment of audit fees, among other costs. This all comes at substantial cost and is an at-risk investment in the project by Climate Friendly. Many land managers would not have the capital available to design and implement the projects without this investment. We also support mobilisation of capital (directly and indirectly) to fund other capital intensive land management practice changes, such as upfront planting costs.

The review consultation paper questions under the section "*Your experience with the ERF scheme*" seem largely targeted at individual land managers. This contrasts with the fact that the majority of ERF participants are supported by one or more service providers. We recommend that the Review Panel consider the range of skills needed to ensure a high integrity carbon crediting framework. Recognising that most participants will have expert support will enable better regulation of the service industry and better advice to land managers about what considerations they should consider when deciding whether to self-manage or engage one or multiple services providers.

As the government continues to scale up its ambition to address climate change, we anticipate the carbon service industry will continue to expand to meet demand. This is to be encouraged, as we have a significant collective task to achieve net zero, and indeed net negative emissions. However, it also creates emergent risks if not appropriately recognised and regulated. To date the industry has undertaken significant efforts to self-regulate, including through the establishment of the voluntary Australian Carbon Industry Code of Conduct (the Code), to which Climate Friendly is a foundation signatory. However, we suggest that in a rapidly growing market this could be enhanced by either formalising a requirement to participate in the Code, or introducing new accreditation requirements for agents to ensure carbon service providers have the requisite skills and experience.

Recommendation:

- ***Government should provide realistic, unbiased guidance to land managers outlining the true complexity of operating carbon projects, and the full package of expertise required. This contrasts with current communications materials published that commonly suggest navigating the scheme is simple and imply land managers could self-service. This would help build trust in the skilled advice provided by the carbon service industry, and enable land managers to conduct an honest appraisal of the trade-offs of self-managing a carbon project, as compared with appointing one or multiple service providers to assist them with project management and administration.***
- ***Government should enhance regulation of service providers, either through formalising the voluntary Carbon Market Institute (CMI) Code of Conduct, or by introducing accreditation requirements for agents administered by Government.***

Governance of the ERF

Scheme level governance

The overarching governance of the CFI Act, Emissions Reduction Fund and the associated IT infrastructure has, in our view, been robust with world-leading government regulation of carbon crediting. Government officials involved in administering the carbon farming framework have shown dedication to implement the intents and purposes of the legislation, and many market participants have shown a similar dedication to best practice by developing voluntary self-regulation, such as through the Code. However, there remain some opportunities to further strengthen governance and address some structural risks to deliver best practice governance and promote continued scale up of the carbon crediting framework.

In **Table 2**, we outline our views on an amended governance structure, which includes greater separation of policy review, policy development, market operations and project compliance functions in line with best practice regulatory frameworks. See section on method governance for detailed recommendations around the policy & method development process.

Recommendations:

- ***Structural revisions be implemented to scheme governance to improve the perception of potentially conflicted roles in a) policy review, b) policy & method development, c) project compliance and d) market operation.***
- ***Restructuring of the ERAC to create additional technical subcommittees with adequate staffing and expertise.***
- ***New technical subcommittees continue to be supported by a form of co-design, such as that currently adopted for method development by the Clean Energy Regulator, involving a broad cross-section of organisations and interests that results in greater integrity and more implementation-ready methods that are informed by diverse perspectives and experience.***

Table 2: Best practice scheme governance structure				
Minister & Parliamentary oversight Maintaining a legislated scheme provides many beneficial governance features. One change we would recommend is to introduce new provisions that enhance transparency of advice provided to the Minister, reduce Ministerial discretion as to whether or not to implement expert advice, and include transparent decision-making criteria to prioritise new methods for co-design.				
• **Policy Review**	• **Policy / Method Development** *Land Sector*	• **Policy / Method Development** *Energy & waste sectors*	• **Project Compliance & registry development**	• **Market regulation**
Climate Friendly supports the Albanese Government's proposal to strengthen independent review of policy implementation and recommendation on climate targets.	The current ERAC structure does not have sufficient land sector expertise. A dedicated committee should be formed to oversight recommendations on land sector methods. The committee role should be to review existing and propose new methods to the Minister against specified criteria.	A separate committee should be formed for any energy and waste sector methods. The appropriateness of these methods should be considered in the context of other policies such as the Safeguard Mechanism. The committee role should be to review existing and propose new methods to the Minister against specified criteria.	Project regulation and registry development should be separated from carbon purchasing or other market regulation functions. Suggest same entity also regulates and develops other environmental credit registries for carbon, renewables and biodiversity projects given close intersection.	Regulates the market exchange which is under development for ACCUs, as well as RECs, LGCs, biodiversity certificates. If government plans to continue to purchase consider if this fits with market regulator or other investment entity such as CEFC or ARENA, or the Department.
Who: Climate Change Authority	**Who:** replace ERAC with new Land Technical Committee	**Who:** replace ERAC with new Energy & Waste Technical Committee	**Who:** CER or alternate entity if CER maintains market regulation function	**Who:** new entity or merge with existing market regulator
Expertise required: the CCA should be supported by a broad panel of expertise. CCA Board members should publicly declare any conflicts of interest on a public register and should not have paid employment or other financial benefits (for example shares) in a market participant or other relevant entity that may conflict with their ability to independently perform functions. .	**Expertise required:** Secondee from carbon project compliance entity with experience regulating; rotating panel of scientific experts (e.g. ecology, agronomy, GIS etc); land management practitioner; auditor, economic modelling, legal	**Expertise required:** Secondee from carbon project compliance entity with experience regulating; rotating panel of scientific/engineering experts (e.g. energy technology, waste management etc); infrastructure practitioner; auditor, economic modelling, legal	**Expertise required:** Compliance and enforcement; technical method specific expertise for each regulated sector; IT; intelligence & audit; legal; communications, education & engagement	**Expertise required:** Economic modelling & market governance; compliance & enforcement; intelligence & audit; legal; communications, education & engagement

Project level governance

We propose that there are three key parameters that must be balanced when examining options to reform and strengthen project level governance:

- maximising volume of abatement to achieve climate goals
- maximising integrity to ensure certainty of impact
- minimising costs (or maximise /simplicity) to enable greatest participation.

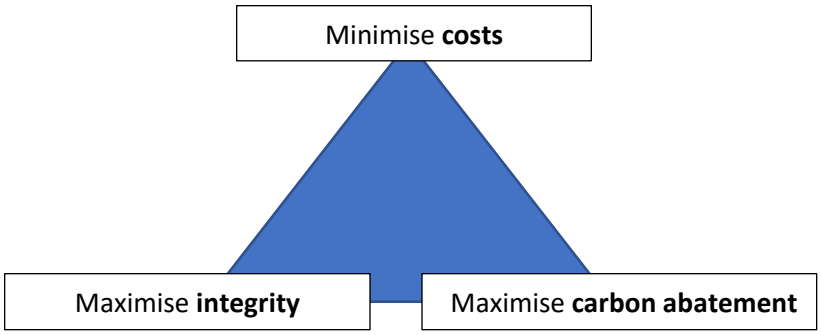


Figure 1: constraint triangle showing competing priorities in project level governance

From our experience, while all three parameters are important, it is very difficult to achieve all three at once. The Review Panel should carefully consider which of these objectives are most important in assessing scheme governance. Climate Friendly believes that maximising volume of abatement is one of the most critical goals in order to urgently tackle climate change, and maximising integrity of this abatement is key to ensure the impact is validated. Since the scheme commenced, we have already experienced rising project costs due to strengthening of our integrity controls and investments to increase the accuracy of our abatement forests using the latest science and technology. While we seek to minimise costs through continuous system improvements where possible, we believe that higher scheme complexity and associated costs for project implementation are, to a certain extent, necessary trade-offs, as high integrity abatement requires expertise and verification of outcomes to deliver and prove results.

Recommendation:

- ***Provide clear guidance on the relative importance and potential trade-offs between high integrity, volume of abatement and costs of compliance or scheme complexity. Clearer guidance from the government on the costs of compliance and expertise required would help prospective participants make more informed choices on self-management vs service partnerships when commencing a project.***

Offsets integrity standards

Climate Friendly believes that the offsets integrity standards are generally aligned with international principles and emergent standards governing high integrity carbon projects, and therefore remain fit for purpose. We do however feel recent questions related to the offsets integrity standards are more related to perceived issues with their application. We strongly support increased transparency on how the standards are applied by the relevant governance body and Minister in decision making processes.

Recommendation:

- ***Increase the transparency of how the offsets integrity standards are applied by the ERAC or as part of Ministerial decisions related to method prioritisation and approval.***

Method development governance

Since the Carbon Farming Initiative (CFI) Act was made in 2011, the process and responsible entity for method development under the CFI/ERF has changed over time. The Table below summarises the evolution in the method development process, and the advantages and disadvantages of each approach.

Table 3: summary of historical approaches to governance of method development			
Time period	2011 – 2015	2015 – 2021	2021 - present
Entity responsible for method approval	Domestic Offset Integrity Committee	Emissions Reduction Assurance Committee	Emissions Reduction Assurance Committee
Entity responsible for method development	Any interested stakeholder, with support from the Department	Department of Environment or equivalent	Clean Energy Regulator
Method development process	First draft prepared by interested stakeholder using a template. Later drafting done by Department in collaboration with interested stakeholder.	Drafting conducted by Department using advice from expert committees and consultants. Input from interested stakeholders generally limited to 30 day consultation period.	Drafting conducted by the Clean Energy Regulator with regular input from stakeholders via a co-design process, plus a formal consultation process on near-final draft
Process to suggest new methods	Application from interested stakeholder to the Department	Ministerial discretion	Annual nomination process with Ministerial discretion on selected priorities
Advantages	High level of industry involvement Relatively rapid pace of method development	High level of Government control over the process	Mix of Government control and industry involvement Relatively rapid pace of method development
Disadvantages	Large volumes of method applications that were sometimes poorly drafted or very narrow in scope, making administration difficult	Slow pace of method development Resultant methods were highly scientific that sometimes had limited real world capacity for implementation. Limited ability for stakeholders to influence method development priorities	Lack of clear and transparent decision-making process around Minister's choice for method prioritisation[1]

[1] While some methods, such as the Integrated Farm Management Method, had support from a very broad range of organisation types and sectors and publicly available documents outlining how they met the assessment criteria, the rationale for prioritisation of some other methods was less clear.

Currently, there are thirty-seven operational carbon farming methods. There are approximately 21 closed methods which are no longer active. While there are many available methods, in our experience many of the methods are not viable to implement. This is for a variety of technical, operational and financial reasons.

Based on our experience in these method development processes, we believe the most rigorous methods that are also likely to have significant uptake are those that were developed alongside an inclusive co-design process, similar to that currently conducted by the CER.

Recommendations:

- ***Establish a clear and transparent decision-making process around prioritisation of any new methods for development or variation.***
- ***Continuation of a method co-design model similar to that currently adopted by the Clean Energy Regulator. This will ensure high integrity, implementation-ready methods that are informed by both the latest science and real world operational issues.***
- ***Establishment of two separate advisory bodies, one focused on the land sector and one on energy and waste sectors.***

Transparency and data access

Sufficient transparency on decision making processes and access to key project information is at the heart of recent criticisms of the ERF. Climate Friendly supports increased transparency in both these areas to improve confidence in Australia's carbon crediting framework.

Transparency of regulatory oversight

While the Clean Energy Regulator has published multiple guidance documents with key regulatory interpretations, we believe there is an opportunity to further strengthen transparency of regulatory decision making through the publication of public rulings by the Clean Energy Regulator. Publication of rulings would provide greater consistency of advice, and ensure all participants have a common interpretation of the scheme. This increased transparency could be delivered through a system similar to the Public Rulings provided by the ATO.

Recommendation:

- ***Create a public registry of individual precedents or rulings on carbon farming projects, similar to the system of public rulings provided by the ATO.***

Transparency of project information via a National Integrated Land Database

As highlighted in our covering letter and Part 2 of this submission, Climate Friendly and our partners collect a substantial volume of environmental, carbon, agricultural production and other land management data spanning a 35-year period as part of assessing and implementing a land-based carbon farming project. There is a significant opportunity to share this data to support ongoing research, continuous improvements of national carbon, environmental and agricultural policies, programs, and systems, and to provide information to other land managers

to aid decisions on managing their property. Similar opportunities were identified in the Samuel's Review of the nations environment laws, which recommended changes to improve the centralisation of industry and government collected environmental data.

In the case of carbon farming projects, this data is tightly linked to privacy laws and the livelihoods of individual land managers. Therefore, there are careful legal, ethical and technological considerations in enabling access to this information. Technical challenges to sharing data are partly owing to the immense size of the data sets, and also related to the need for different types of data to be linked or integrated. For the last two years Climate Friendly has been working on possible solutions to enable data sharing with industry, government and research partners, and supports the establishment of a national data sharing platform which makes information accessible, while also protecting privacy.

Advances in data infrastructure technology mean it is now possible to bring together agricultural, biodiversity and carbon storage data at property, regional or national scales. A National Integrated Land Database, with a data discovery portal, sharing agreements and usage licenses, will allow organisations and individuals to opt-into sharing information for purposes beyond just project level compliance and enforcement.

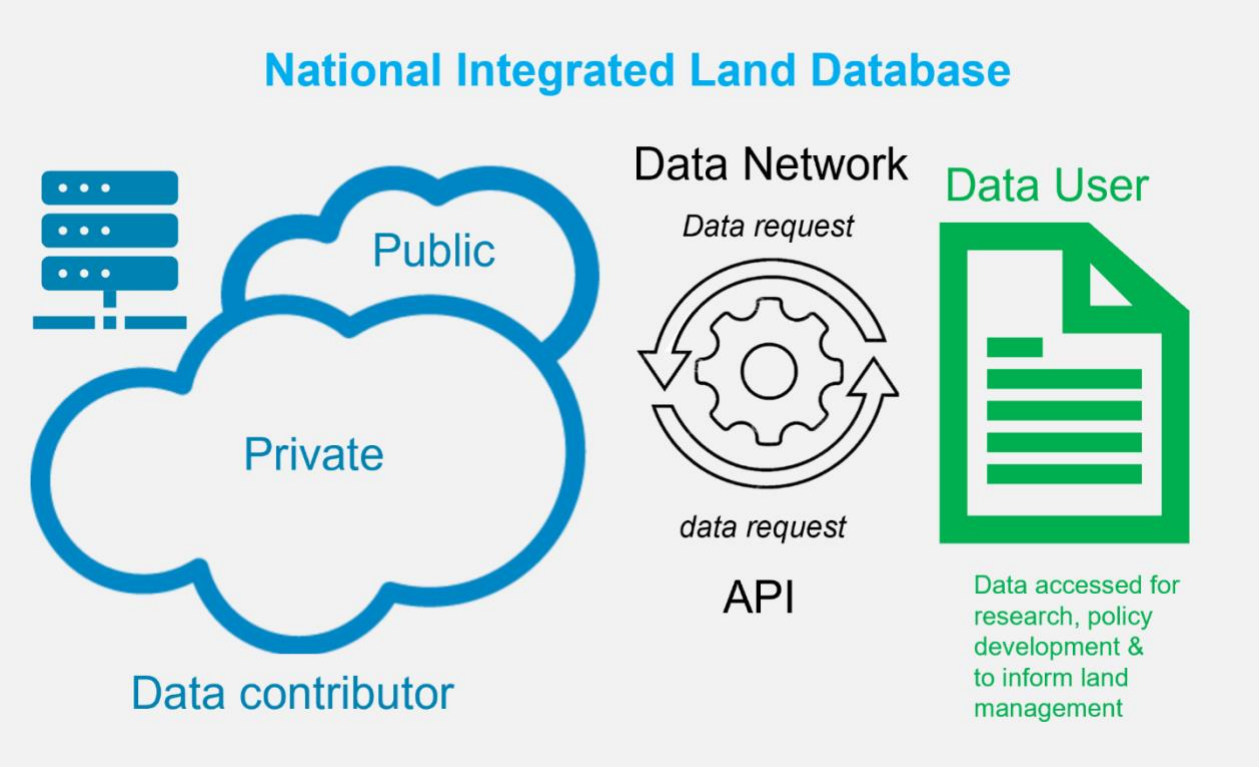


Figure 2: A regulated data network links data contributors to data users as part of a National Integrated Land Database

Creating a data network will enable public and private organisations or individuals to continue to hold and manage the data they collect, while making it available to data users in a de-identified, confidential manner. This is achieved through an Application Programming Interface (API[2]) implemented by multiple data contributors to allow these distributed datasets to be unified and accessed as a collective whole. Facilitating efficient data requests and exchange practices is a more agile way to manage and access large datasets with multiple contributors, than designing and implementing a single consolidated, centralised database. A custodian or oversight body, as proposed in the Samuels Review, can regulate the data network by setting standards for data contributions that public and private contributors implement. This also reduces costs of data collection by enabling private organisations to opt-in and contribute privately funded data sets, including lidar, field inventories and other environmental, carbon or agricultural management datasets, allowing government and research bodies to supplement these data sets with strategic data acquisitions.

This short video helps explains how the database could work and how governments, conservation organisations and agricultural producers might all contribute information and obtain benefits: https://www.climatefriendly.com/future-of-carbon-farming/.

Recommendations:

- ***Establish a National Integrated Land Database to enable sharing of carbon, environmental and agricultural production data in a way that protects privacy while enhancing transparency of information, expanding research capability and informing best practice land management and policy development.***
- ***Consider the interaction of data transparency recommendations made in the Samuels Review of the nations environment laws.***

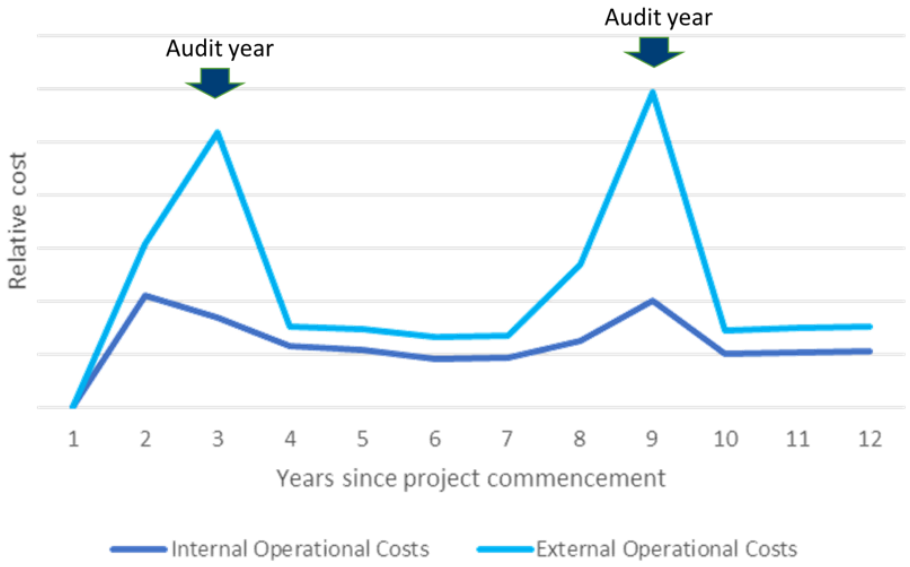
Procedural improvements

Process-based audits

As part of our extension services, Climate Friendly oversees our partner's project audits. This includes preparation of the audit pack (including field monitoring data, offsets reports, abatement calculations, spatial files that meet threshold accuracy tests, third party management information etc); engagement of the independent NGER accredited auditor, oversight of the audit process, responding to auditor action requests, participation in auditor field visits, and submission of the final report and accompanying request for ACCUs to the Regulator. Costs associated with data collection and the audit are extensive and are funded by Climate Friendly as part of our investment in the project to remove barriers to participation. For our projects that are modelled (i.e. projects that estimate abatement using a model, and do not involve direct field measurement of trees or soil), audits and related evidentiary requirements are generally the highest project cost after the project pre-feasibility assessments. Figure indicates the relative costs associated with audit years. Reducing audit costs is a way to increase viability of projects, however, any reduction in audit costs must be done in a way that maintains integrity.

[2] APIs are information exchange protocols that allow systems to communicate with one another. Implementing data exchange practices in software allows for automation of search, access control and quality assurance.

Figure 3: Indicative cost trends for a typical modelled carbon farming project



We propose the introduction of an option for process-based audits for carbon service providers, as opposed to the current system where each audit is conducted for each project separately, even though the project utiilises the technical systems and procedures as numerous other audited projects. Transition to process-based audits would save significant costs and enable us to support smaller scale project participants, as currently smaller scale projects are not commercial to operate as they cannot cover the quality assurance costs. Analysis conducted by Climate Friendly suggests that implementation of process-based audits could unlock the commercial viability of many smaller scale projects, and is akin to a $5 or more increase in carbon price.

Process-based audits are a common feature in other sectors, for example, finance. They would involve company-wide audits of processes and systems, where the implementation of a company's internal quality control systems would be checked; coupled with appropriate project level spot checks. The spot checks could be based on a specified set of focal items as identified by the Regulator based on a risk assessment against the method. The recommended assurance level for the company wide process audit is reasonable assurance. The suggested timing of process-based audits would be every 1 – 5 years depending on portfolio size and frequency of reporting. There could be requirements for notification in the event of a substantial change to company processes or structure.

We believe that introduction of a process-based audit option would enhance scheme integrity and also enable greater participation. This is because the current audit arrangements tend to replicate the same checks and investigations for each project, with a lesser focus on assessment of company systems, processes and data storage. Project-specific audits should continue to be an option as an alternative to a process-based audit to enable different participants to choose depending on the number of projects they participate in.

Recommendations:

1. ***Introduce the option of process-based audits to lower transaction costs, utilise emerging technologies to unlock commercial viability of carbon farming for smaller scale land managers***
2. ***Auditor guidelines and training should be updated to ensure auditors have the appropriate skills and expertise to conduct process-based audits. This could draw on guidelines and requirements from other sectors where process-based audits are common***

Co-benefits and other impacts

Best practice land-based carbon farming has a significant potential to deliver multiple environmental, Indigenous, agricultural productivity and other benefits. There are many controls already embedded within the ERF scheme and its methods to minimise the risk of adverse impacts.

Recognising that many carbon farming participants may also wish to participate in other certification standards or markets for ecosystem services, or to otherwise value-add on their existing carbon projects, Climate Friendly believes it is important, to harmonise the regulatory frameworks for carbon markets with other emerging ecosystem markets or standards that govern claims related to other co-benefits. This will streamline administration, avoid risks of double claiming in different schemes, reduce the cost of compliance, and optimise the ability of land managers to deliver multiple, long-term benefits.

Integrated governance with other emerging policies and programs

The Albanese Government is working on a range of complementary policy initiatives, many of which have parallel consultation processes currently underway. These include the Biodiversity Stewardship Certificate framework, a new drought plan, a Climate Active land standard, remote employment plan, among other initiatives. Many of these areas relate to core or co-benefits of carbon farming, and such benefits are increasingly being valued financially, as a result of the Taskforces on Climate-Related and Nature-Related Financial Disclosure and other initiatives. As these emergent attributes are increasingly valued as benefits or 'products', increased and harmonised regulatory oversight is required. To reduce the cost of this oversight, it is important to integrate and align both carbon and other benefit verification requirements or standards wherever possible. This will minimise costs, reduce risks of double claiming of benefits, improve understanding of rules, and ultimately increase integrity and impact.

Recommendations:

1. ***Amend the Carbon Farming Initiative Act to incorporate the Biodiversity Stewardship Certificate Framework into a joint carbon and biodiversity framework, rather than creating two separate but mirroring pieces of legislation.***
2. ***Enable to Regulator to declare one project that applies multiple methods or protocols, so that land managers can opt to participate in relevant carbon farming methods and biodiversity protocols on a single property through one harmonised project.***

3. ***Consider other opportunities to integrate emerging standards, policies and programs to optimise multiple benefits, streamline land manager participation and help to reduce regulatory complexity and costs of participation in parallel schemes.***

Maximising Indigenous benefits from carbon farming

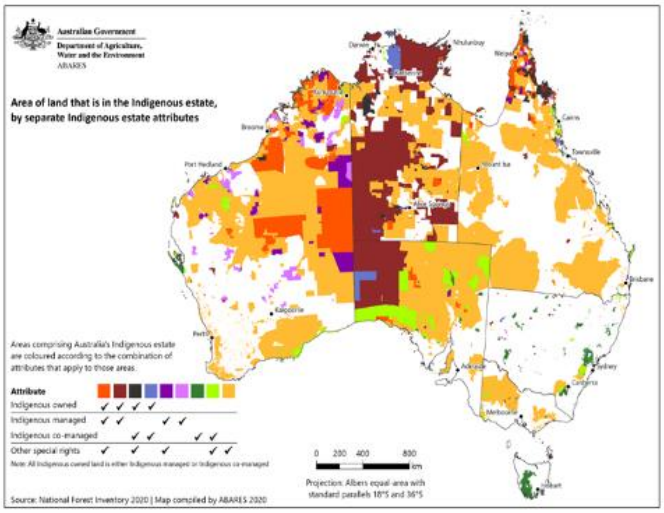
While some important financial and non-financial benefits have flowed from some carbon projects to Indigenous Australians, we believe that there is significant scope to scale up these benefits and use carbon farming as a key mechanism to deliver economic opportunities for Indigenous people, alongside environmental repair and reconciliation with non-Indigenous Australian partners. It is important to review the types of opportunities for Indigenous Australians in the context of the different types of Indigenous land estate around Australia.

Summary of Indigenous Estate

While some Indigenous Australians have had land rights and/or native title determinations recognised, many remain excluded from having full ownership and control of the underlying land. As a result, economic opportunities for many Indigenous Australians remain limited to receipt of more passive income under Indigenous Land Use Agreements. Many Aboriginal corporations are underfunded (e.g. median income of native title prescribed bodies corporate is less than $90k p.a), with limited capital base and/or income.

Table 4: Indigenous Estate

Estate Category	1788	2021
First Nations owned*	100%	17%
First Nations managed*	100%	18%
First Nations co-managed*	-	4%
Other special rights (e.g. native title)*	-	44%
No explicit rights, management or ownership*		43%



** These categories are not mutually exclusive and have substantial overlap. A total of 57% has some form of First Nations right, ownership and/or management*

Indigenous Estate and Carbon Farming:

Opportunities for participation in carbon farming vary across these different categories of Indigenous Estate. Our understanding of the potential opportunities is summarised in the table below.

Table 5: Opportunities to participate in carbon farming by Indigenous Estate Type

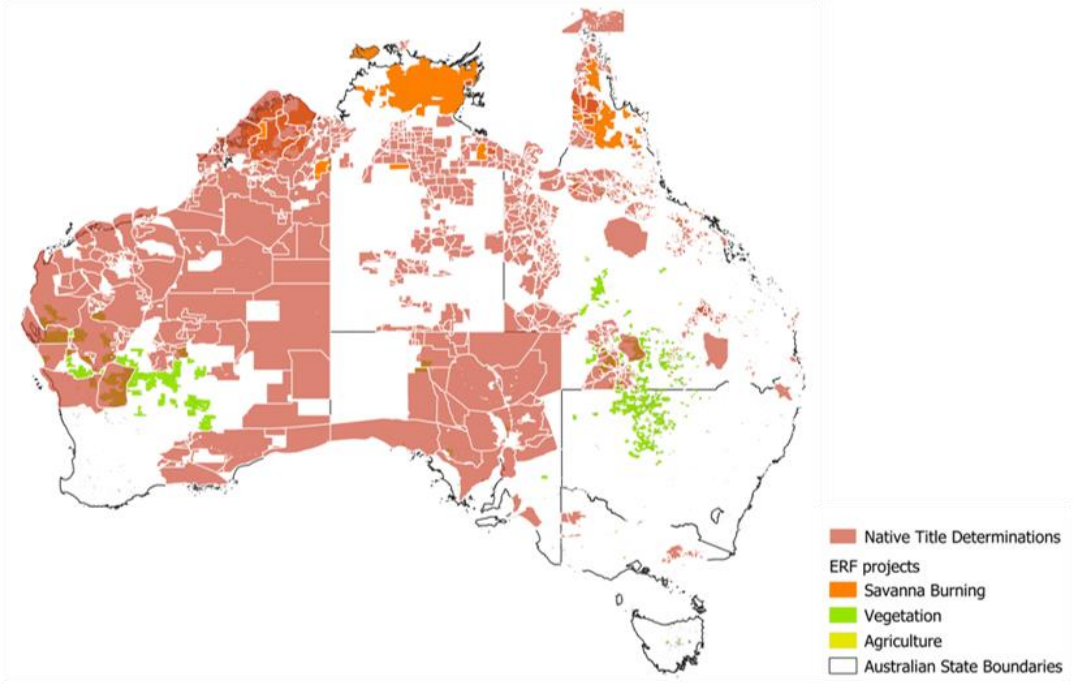
Estate Category	1788	2021	*Carbon farming participation type*		
			Legal right	*Eligible interest holder*	*Implementing partner*
First Nations owned*	100%	17%			
First Nations managed*	100%	18%	Depends on tenure	Depends on tenure	
First Nations co-managed*	-	4%	Unlikely	Depends on tenure	
Other special rights (e.g. native title)*	-	44%	Yes if exclusive native title otherwise unlikely	Yes if determined native title	
No explicit rights, management or ownership*		43%			Depends on relationship and capacity

** These categories are not mutually exclusive and have substantial overlap. A total of 57% has some form of First Nations right, ownership and/or management*

As noted in the recent September 2022 report prepared by the Indigenous Carbon Industry Network (ICIN) titled *Mapping the Opportunities for Indigenous Carbon in Australia: Identifying opportunities and barriers to Indigenous participation in the Emissions Reduction Fund,* Indigenous Australians participation in carbon farming has to date been largely limited to two method, namely savanna fire management and human-induced regeneration.

We believe there are some key lessons from engagement in these two methods to date which could help unlock broader opportunities across the Indigenous Estate. **Climate Friendly has reviewed the ICIN Report, and broadly supports its recommendations, including specifically their recommendation to develop an Integrated Farm Management Method that is suited to all environments across Australia, including the Desert and the Savanna, and has appropriate Indigenous participation in the design and development.** In this submission our recommendations are focused on expanding on how we think the scheme could be strengthened to unlock further benefits for a specific sub-set of the Indigenous Estate, Native Title Holders, based on our experience working with Native Title Holders under the human-induced regeneration method.

Figure 4: location of carbon farming projects relative to Indigenous Estate



Since 2014, Climate Friendly has developed partnerships with Native Title Groups on 18 carbon farming projects, delivering more that 4 million ACCUs from those projects to date. This is 92% of the ACCUs issued with Native Title Partnerships under that method. These Native Title Partnerships provide multiple benefits, including new economic opportunities for the Indigenous groups via a revenue or ACCU share, annual field monitoring work, ability to develop bush tucker gardens and undertake cultural heritage surveys, among other benefits. Most importantly, they have also resulted in strengthened relationships been agricultural producers and Traditional Owners and improved health of country. While these agreements are a positive step, we believe there are major opportunities to deepen the involvement and benefits for Indigenous Australians through a combination of governance reforms and development of the new Integrated Farm Management Method.

Firstly, when examining Figure 4, it is apparent that there is a higher concentration of projects located on land that does not have declared Native Title. This is despite considerable efforts by Climate Friendly, and others in the carbon industry more broadly, to expand the impact of carbon farming on Native Title land. So far, only 22 human induced regeneration projects with Native Title determinations have been issued ACCUs, while 72 projects are yet to obtain consent or have any ACCUs issued. Nearly half of these projects were registered more than two years ago. A further 21 projects with Native Title have been discontinued or revoked. Climate Friendly believes there is an opportunity to support more projects to be successful on Native Title land and deliver benefits to Indigenous Australians, along with the land manager partners.

Climate Friendly has identified the following key barriers to widespread implementation of carbon farming projects on land with a Native Title determination:

1. Establishing a partnership with Native Title Holder groups can be complex, costly and time consuming. In our experience, formation of these partnerships has taken 18 months to four years. While the outcome is highly rewarding, the upfront investment can be daunting, for both the Native Title group and the land manager who are time limited.
2. There are limited support services for the Native Title Holders to get advice on partnership models, and this can slow down their ability to make informed decisions. In our experience, we provide funding for independent advisers, but these advisers still have limited knowledge of carbon farming and often have high competing workloads.
3. Many of the Native Title Holder groups we have engaged with are overwhelmed by a high number of various regulatory processes and applications that their Prescribed Body Corporate must consider under other legislation. While carbon farming projects involve regeneration of their traditional lands, their ability to consider opportunities to partner on carbon farming projects is often delayed by statutory obligations to consider mining and other similar applications, even in instances where such applications deliver no economic benefits to the Native Title group.

Addressing these impediments to Native Title Holder participation may help to improve the flow of benefits to Indigenous Australians from carbon farming and promote reconciliation in regional Australia.

Recommendation:

- **The eligible interest holder consent process for Native Title Holders be reviewed to determine if the process is fit for purpose for this category of interest holder, or whether changes could be made to improve this process for Native Title Holders and further encourage land managers to establish projects in partnerships in regions with determinations. Opportunities to strengthen may include provision of further support mechanisms (financial and advisory) for Native Title Holder groups. Additionally, it should be considered whether there is any benefit to regulatory notification deadlines similar to those that apply in other sectors such as mining. This review should be done through a consultative process involving Native Title Holder groups and other Indigenous Australian input, as well as land managers and service providers.**

Maximising biodiversity co-benefits

Carbon farming vegetation projects store carbon through increasing trees and shrubs and not maintaining habitat. Carbon farming soil projects often result in increased pasture biodiversity which in turn increases insect and bird life, in addition to soil microbial biodiversity. These activities can be expected to improve native habitat and have flow on improvements to biodiversity. Climate Friendly has provided a detailed submission to the Federal Government on the proposed Biodiversity Certification Scheme. While we support the development of the Scheme, we have outlined in our submission views on how best to align the legislative elements of carbon and biodiversity to improve the biodiversity outcomes.

Please refer to our submission on the Biodiversity Certification Scheme for more detailed recommendations on how biodiversity benefits can be optimised.

Improving regional development and local communities

Climate Friendly and our partners believe that carbon farming should have positive impacts on local communities. To achieve this aim, we make significant investments into the regional communities where we live and work, and our partners have been shown to re-invest their carbon farming revenue back into their farms and the local communities they live in.

An analysis of farm management and tenancy statistics from Climate Friendly's human-induced regeneration portfolio shows that 49% of projects are owner-occupied and a further 30% employ on-site managers. The remaining 21% are actively managed either by the owner, who typically lives nearby in the closest regional township, or a manager who is employed to manage multiple neighbouring stations. When this is compared to the farm tenancy prior to the carbon project, there has been a slight increase to the level of owner-operated on-farm management of our projects since they started carbon farming. This appears to be a result of the improved financial position enabling farmers to remain on the land.

Table 6: Farm manager tenancy on Climate Friendly human-induced regeneration projects

Farm tenancy / management arrangement	Proportion of CF projects
Owner occupied	49%
On-site manager	30%
Off-site manager	13%
Off-site owner manager	8%

Source: Survey conducted by Climate Friendly of its own clients

New economic opportunities in regional Australia

At the time of writing, over 35.8 million Kyoto-compliant ACCUs have been issued to HIR and NFMR projects since 2015, with an estimated value of over $622 million based on average auction prices (*note: actual value will be higher, given some ACCUs traded outside ERF auction mechanism, estimated value calculated based on average ERF price*).[3] Around half of these have been issued to projects which Climate Friendly supports.

Regional training, community events and services

Climate Friendly supports the local communities in which we work in a range of other ways, including being a Co-Founder of the Wal Dunsdon Memorial Scholarship which was established in 2019. Annually, we host and support a variety of other regional community events and services, including field days, sporting events, and supporting important services such as the Royal Flying Doctors.

[3] Source: Clean Energy Regulator ERF Project Register (available at: https://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register). Accessed 30 September 20222; and average auction price of $17.35 sourced from Clean Energy Regulator April 2022 Auction Results. Available at: https://www.cleanenergyregulator.gov.au/ERF/auctions-results/april-2022

Employment opportunities for regional Australians

Apart from opportunities created directly through the management of carbon farming projects, Climate Friendly is also a direct employer of people who live in the communities where we work. In the last two years our team has nearly doubled in size. Our staff live in Quilpie, Dubbo, Toowoomba, Tamworth, Moree, Trentham, Darwin and many other regional communities around Australia. We understand that country needs management and communities need people, and this is at the core of our partnership model.

Carbon farming enhances agricultural production outcomes

Most carbon farming projects we support involve improved management of livestock as a part of the project. We note that to be eligible for a human-induced regeneration project, land managers have historically been supressing regeneration on their property, typically through a combination of over-stocking relative to pasture availability, inadequate infrastructure and/or grazing rotations, vegetation clearing and/or lack of weed control. This means they have not had an optimal mix of sustainable agriculture and environmental stewardship, and that a carbon project necessarily involves adoption of more sustainable practices which improve long-term agricultural viability. A very common situation land managers found themselves in prior to starting a carbon farming project was running stock numbers above the land carrying capacity to ensure the short-term viability of their business and debt servicing. This resulted in land managers being in a position where both their land and agricultural activities were less productive for the medium to long term. Carbon farming has enabled their land to regenerate and for stock levels to be re-aligned with a level below carrying capacity, benefiting both the environment and agricultural productivity. The carbon project is an additional complementary activity and a new source of revenue, alongside sustainable agricultural and environmental stewardship activities that our carbon farming partners conduct on their respective properties.

For these reasons, we believe that Ministerial veto powers inserted by the Morrison Government into Section 13(4) and 20C of the Carbon Credits (Carbon Farming Initiative) Rule 2015, should be repealed, as the reasons cited for requiring the Ministerial veto power are erroneous. We reiterate from our January 2022 submission to the Morrison Government that this amendment to the CFI Rule introduces uncertainty and duplication, unnecessarily increases scheme complexity without adding any new controls, and potentially leads to material adverse impacts for regions that are yet to benefit from carbon farming. Given the significant potential for the veto power to lead to adverse impacts, we recommend that this project level requirement be reconsidered and removed as part of the ACCU Review. Further details on how it duplicates existing requirements for weed, pest and fire controls are included at **Attachment A**.

Improving drought resilience

In 2021, Climate Friendly received an NRM drought resilience grant from the Australian Government's Future Drought Fund. The purpose of the grant was to understand the impacts of carbon farming on drought resilience. As part of the project activities, Climate Friendly worked with Charles Sturt University to conduct a survey of 200 farmers from across Australia. The detailed results are presented in **Attachment B**.

Key findings of the research are that carbon farming is viewed as participants as a powerful drought impact mitigation tool. 75% of carbon farming respondents indicated that the carbon farming revenue helped them meet their loan repayments during drought. The revenue provided from carbon farming helped support and enhance their traditional agricultural enterprise.

Improving management of pests, weeds and fire risks

For human-induced regeneration projects, the humane control of feral animals and the management of plants that are not native to the area, are two of the eligible management changes. Therefore, control of feral animals and weeds is an integral mechanism behind the carbon farming payments for many land managers.

In addition, the carbon farming legislation contains numerous requirements for management and reporting of weed, pest and fire risks, either directly or indirectly via at least nine existing provisions in the CFI Regulatory Framework, as described in **Attachment A**.

Recommendations

- ***Repeal the veto power and requirement for additional project approvals by the agricultural minister for regeneration projects which cover more than 30% of a property (Section 13(4) and 20C of the Carbon Credits (Carbon Farming Initiative) Rule 2015, should be repealed)***
- ***Recognise the positive benefits of carbon farming on agricultural production and drought resilience of farms and regional communities in Australia.***

Relationship to voluntary Climate Active certification

We believe Climate Active policies must be reviewed in the context of Australia's international commitment to limit global warming below 1.5C. Whether or not a % ACCU purchase requirement is appropriate depends on how voluntary actions are accounted for as part of Australia's NDC. This is to ensure that voluntary action supports Australia to increase our level of ambition and go beyond the legislated 43% reduction target.

Separately, we note that Climate Active is currently consulting on a land standard. We believe this is an important development, as it will better enable standardisation of carbon neutrality assessments for the land sector. This standard should be harmonised with emerging best practice for carbon farming methods. We will respond directly to this separate review, but encourage the Review Panel to coordinate recommendations.

Further, Climate Friendly suggests the Australian Government could give greater regulatory guidance on how other non-regulated voluntary carbon market standards can be applied in Australia to ensure that this is done consistently with Australia's National Greenhouse Gas Inventory. The lack of clarity on how and when international carbon standards can be used domestically risks double counting of abatement within Australia and in other nations.

Recommendation:

- ***If the Government's 43% emission reduction target for 2030 takes into account voluntary corporations carbon neutrality commitments, then 100% of Climate Active's offsets should be sourced from ACCUs (rather than the current requirement of 20%). This helps ensure the national ambition is not undermined. However, we note this may also discourage voluntary action which will be***

important to exceed the 43% target and place Australia on a trajectory to meet the 1.5C Paris commitment.

- ***If the Government's 43% target does not include Climate Active carbon neutral commitments, then there is less imperative to mandate the use of over 20% ACCUs in any Climate Active certification. However, any other eligible units able to be used under the Climate Active standard should be carefully screened to ensure they meet a similar integrity benchmark to ACCUs.***
- ***Refer to our separate submission to Climate Active on the proposed land standard and harmonise review recommendations.***
- ***Provide a clear policy position on how and when other international voluntary standards can be applied in Australia, to ensure there is no double counting of abatement.***

Attachment A – Existing controls ensuring adequate management of weeds, pests and fire risk

Requirements for management and reporting of weed, pest and fire risk are already addressed directly or indirectly via at least nine existing provisions in the CFI Regulatory Framework and accompanying guidance.

- concurrence of state and territory laws: all carbon farming projects must comply with state and territory laws, including in relation to weed, pest and fire management (CFI Act s294)
- Non-compliance with an environmental law is also a consideration in relation to fit and proper person test to enable an entity to become or remain a project proponent (CFI Rule s61(1)(e)(i))
- compliance with relevant National Resource Management (NRM) Plan: all carbon farming projects must be implemented consistently with NRM plans, which commonly include provisions related to management of pest, weeds and fire. This must be confirmed as part of the project application and is also commonly reviewed as part of project audits (CFI Act s23(1)(ga)(ii)).
- implementation of relevant management changes related to weed and pest control: two of the five eligible management changes in the HIR and NFMR methods include management of pests and weeds - 'the management, in a humane manner, of feral animals'; and 'the management of plants that are not native to the project area'. (HIR Method s7(2), NFMR Method s1.4(2)).
- permanence plan, including addressing fire risk and management actions: all HIR and NFMR projects must have permanence plans covering the applicable 25 or 100 year period, which must be submitted to the Regulator at legislated intervals. (CFI Rule s13(1)(p) & s70(4A))
- notification requirements in the event of a natural disturbance or fire: in addition to the fire plan, proponents must notify the Regulator within 60 days of 'a natural disturbance that causes a reversal of the removal'. (CFI Act s81)
- Eligible interest holders in the land are required to give consent to the project: common interest holders include state & territory governments, Traditional Owners and financial institutions. These entities commonly request information around permanence obligations and broader land management plans, including in relation to compliance with any relevant state- based laws, lease requirements or lending requirements. (CFI Act s 43-45A)

Given the existing multiple layers of legislation that already seek to address the objectives described in the consultation paper, we question the utility of adding additional administrative processes. This is contrary to efforts underway by the Regulator to streamline administration, reduce scheme complexity and enable more land managers to participate in carbon farming.

Attachment B – Co benefits on drought resilience survey

Key findings:

1. 65% of survey respondents were net promotors of carbon farming as a drought mitigation tool
2. The projects have helped improve their preparedness for drought and helped most meet their loan repayments during periods of drought.
3. The revenue provided from carbon farming helped support and enhance their traditional agricultural enterprise.

Introduction:

In 2021, Climate Friendly received an NRM drought resilience grant from the Australian Government's Future Drought Fund. The purpose of the grant was to understand the impacts of carbon farming on drought resilience.

Method:

As part of the project activities, Climate Friendly worked with Charles Sturt University to conduct a survey of 200 farmers from across Australia.

The research looked at the impacts of carbon farming in relation to the farm business' financial and environmental performance before, during, and after a drought. We surveyed farmers engaged in carbon farming and carbon farming-like activities,[4] and those not engaged in any carbon farming activities. By contrasting responses between these different cohorts, we gained an understanding of the impact of carbon farming on drought resilience, as distinct from other background effects. The survey participants came from across Australia.

Results:

Key findings from the survey were:

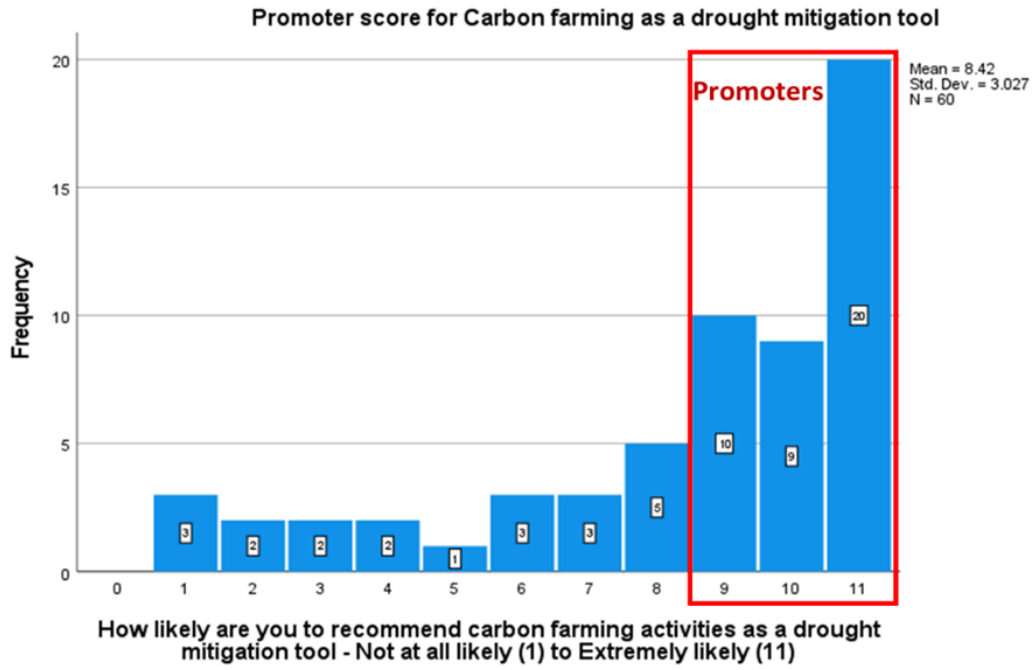
1. 65% of respondents were net promotors of carbon farming as a drought mitigation tool (Figure 1)
2. 73.3% of respondents that had a registered project or were engaged carbon farming-like activities, strongly agreed that carbon farming had improved their preparedness for drought. Similarly, when asked if the carbon farming activities had reduced the severity of drought, 71% of respondents agreed or strongly agreed. This enhanced drought resilience was attributed to both the environmental benefits of carbon farming and the financial benefits.
3. Interestingly, those farmers implementing more than one carbon farming activity scored higher in response to questions about carbon farming improving their drought preparedness and reducing its severity. This suggests that more holistic carbon farming

[4] Participants were mostly engaged in soil management (29.8%), Human-induced Regeneration (HIR) (22%) and environmental plantings (19%). Some participants were engaged in multiple activities. Those with a registered project were mostly engaged in HIR (66.7%).

frameworks such as the Integrated Farm Management Method might further enhance the drought resilience benefits of carbon farming.

4. Of the carbon farming participants that had been paid for their Australian Carbon Credit Units (ACCUs), all but one respondent had reinvested the carbon farming revenue back into their farm. The one respondent that did not reinvest back into the farm, used the carbon farming revenue to purchase another farm. This data suggests that carbon farming revenues are used by farmers to support and enhance their traditional agricultural enterprise.
5. 75% of carbon farming respondents indicated that the carbon farming revenue helped them meet their loan repayments during drought. Those respondents indicated they had stronger business stability during drought, as compared to those engaged in carbon farming like activities.
6. The speed with which decisions could be made relating to drought were also impacted by the carbon farming revenue, with those receiving revenue indicating they were better able to make quick decisions to better manage and recover from because of the revenue safety net.
7. Farmers with a carbon farming project and those implementing carbon farming-like activities had a 6.5% increase in their locus of control over drought, as compared to non-carbon farmers. This is despite the majority of respondents with carbon farming projects coming from regions that are at higher risk of drought.
8. Those engaged in a carbon farming project and receiving carbon credits also reported they experienced reduced stress during drought as compared with before having the carbon farming project.

Figure 1 Promotor score for carbon farming as a drought mitigation tool



Submission: Independent Review of Australian Carbon Credit Units
September 2022

About Climate Friendly

Founded in 2003 by a CSIRO scientist, Climate Friendly is a profit-for-purpose company with a vision for a productive, sustainable land sector that contributes to a zero net emission Australia by 2050. We achieved our first target to support 20 million tonnes of greenhouse gas reductions at the end of 2020, and our purpose is to scale up to 100 million tonnes by 2025. We are one of the longest operating and most experienced carbon extension service providers in Australia. Our growing team of 65+ expert staff has supported registration of over 150 carbon projects since 2014. We partner with agricultural producers, foresters, Traditional Owners, conservation organisations and governments to design and implement these projects across approximately 10 million hectares of land.

Part 2: Technical rigour and integrity of ERF methods & projects

Each carbon farming method has its own set of detailed technical rules and guidelines. In this part of our submission, we provide an assessment in relation to the Human-Induced Regeneration (HIR) method and the HIR projects that we service, as these projects form a significant portion of our project portfolio and an important component of the ACCU Review Terms of Reference. **The data presented in this submission demonstrates that the HIR method has high integrity, rigour and an independent scientific basis, and the ACCUs issued to HIR projects we support have been credited on a conservative basis.**

Firstly, we note that commercial viability of land management practice changes has been the key driver of ERF project locations to date. This is shown below by reviewing Figure 1 and 2. Figure 1 shows projects overlaid with average land values (Data source: Rural Bank, Australian Farmland Values 2022). This highlights that land-based ERF projects have to date predominately been located in regions with lower land values (i.e. below $1000/per hectare, noting values for WA are not all available but in our experience also fall into this category in the regions were ERF projects are located). Figure 2 shows the ACCU price since 2015 (ERF Fixed & Optional Auctions, plus ACCU spot trades), compared to the New Zealand and European carbon credit unit prices. This highlights that the emerging ACCU market has been conservatively priced to comparable international markets, and that it only started to modestly increase in the later part of 2021 to spot prices consistently above $27. Some commentary on the ERF has inferred that the fact that most ERF projects are located outside high rainfall and biodiversity regions is due to the low integrity methods. However, in our view, low ACCU prices are the driver of project locations. At lower prices, it is only commercially viable to make land management practice changes on lower productivity and lower value agricultural lands. The increase in ACCU prices in 2021 also coincided with an increase in registrations of projects in higher value land areas (refer Figure 1 and increase of registrations in higher value lands in eastern Australia). As such, we suggest that a well-functioning carbon market underpinned by strong emissions reductions targets and comparable international carbon prices is the key to incentivising greater uptake of ERF methods in higher value land and higher biodiversity regions.

Figure 1: ERF project registrations pre and post July 2021 compared to median property values per hectare

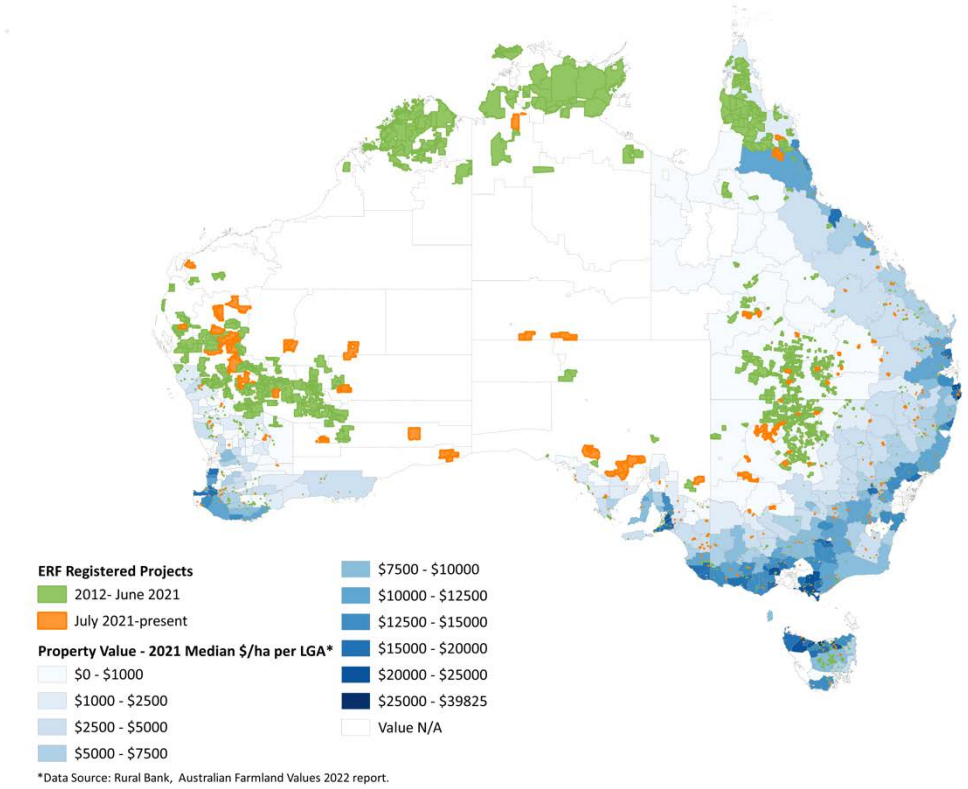
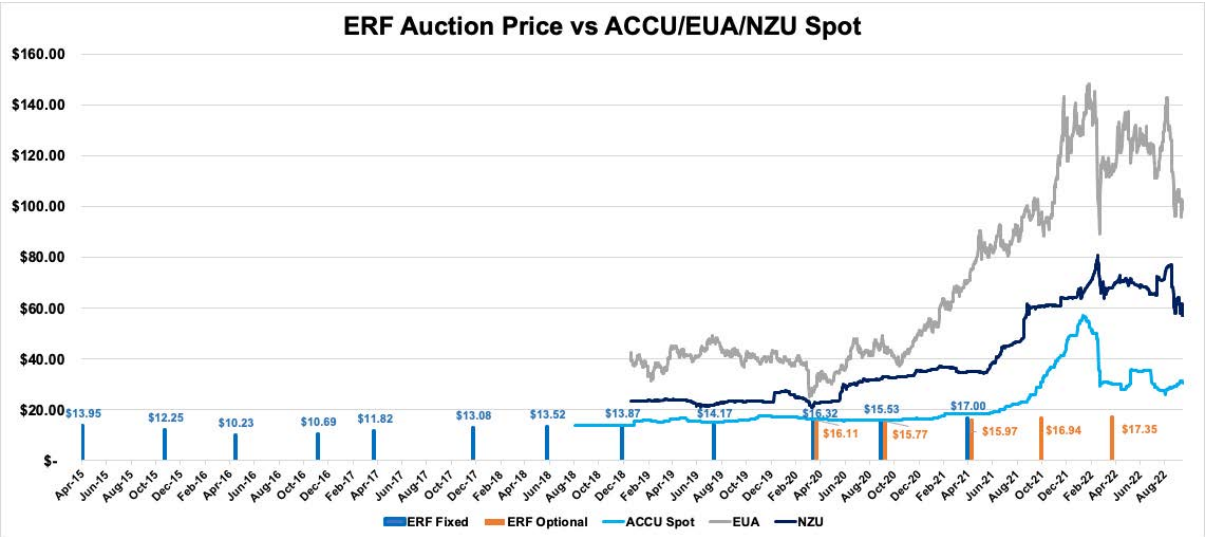


Figure 2: ACCU and international carbon price comparisons since 2015



Detailed analysis on Human-Induced Regeneration (HIR) Method

This section provides detailed analysis related to:

1. Recent claims raised about the HIR method; and
2. An assessment of the HIR method in relation to the offsets integrity standards.

Climate Friendly summarises the key concerns raised and our responses to these concerns through an analysis of the below questions:

1. Does grazing management suppress vegetation (woody biomass) in the rangelands?
2. Can vegetation in the rangelands achieve forest cover or are the rangelands regions unable to support forest cover?
3. Do HIR projects provide adequate evidence of suppression pre-project and evidence of the removal of suppression following project commencement?
4. Is removal of suppression leading to increase in forest cover in HIR project areas?
5. Are HIR projects over credited or conservatively credited when compared to actual abatement? Specifically, are pre-existing trees being credited, or does their presence in the project estimation areas create a risk of over-crediting, or are their sufficient controls to ensure pre-existing trees are accounted for and crediting is conservative?

Our analysis and the information provided in this submission demonstrates the following:

1. **Grazing causes degeneration and suppression of palatable vegetation**.
   - Livestock (e.g. sheep & cattle) and goats eat palatable woody vegetation.
   - This is supported by an extensive body of peer-reviewed science, as well as auditable project-specific data, and results in suppression of woody biomass.
   - 89% of projects involve multiple management changes to remove multiple forms of suppression which collectively have prevented forest regeneration in the past.
2. **The Australian Rangelands can form and sustain acacia forests and acacia open woodland forests which have greater than 20% tree canopy and store carbon**
3. **HIR carbon projects provide extensive evidence of project level suppression and regeneration following the removal of suppression to independent auditors and the Regulator.**
4. **There is a clear detectable trend of increasing forest cover in project areas that is correlated with management change to remove suppression factors (over-grazing, clearing and uncontrolled feral animals).**
   - Carbon projects should be viewed as *facilitating* the ongoing growth and survival of trees that has in fact been *triggered* by rainfall and other environmental conditions. They involve removing suppression agents which were stopping forests from regenerating (i.e. rain makes trees grow, land management changes remove inhibitors to growth).
   - There is no discernible difference in the rate forest regeneration between projects with avoided clearing compared to grazing management as the key practice change. This suggests that both are equally valid ways to sequester carbon.
5. **HIR projects are being issued ACCUs conservatively, and pre-existing trees are appropriately accounted for in abatement calculations.**
   - The quantum of issued ACCUs to projects we support is less than ground measurements of actual carbon stored carbon in the regenerating forest conducted by CSIRO.
   - FullCAM was calibrated with pre-existing trees in the calibration sites and the HIR method has several controls that restrict the possibility of any risk of over-crediting

Recommendations:

1. *Note the evidence of grazing, feral animal, clearing and other suppression of vegetation in the rangelands region where human-induced regeneration projects commonly occur*
2. *Note the evidence of land management practice changes and the consequent regeneration of the project implementation areas that has occurred in human-induced regeneration projects. Confirm that there is no evidence of fraudulent conduct, and that ACCUs issued from human-induced regeneration projects are based on credible science, have rigorous technical safeguards, and passed independent audits.*
3. *Note the conservative crediting of carbon abatement compared with actual carbon stored in HIR projects as verified through ground measurements*
4. *Note the substantial risk of plantation forests being cleared and not replanted, releasing carbon (refer Appendix 5, further information available on request)*
5. *Note the potential of the Integrated Farm Management method to scale up land-based carbon sequestration using the latest science and technology, informed by lessons from implementation of land-based carbon projects to date, and support finalisation of this method as a priority.*

1. Does grazing management suppress vegetation in the rangelands?

Summary:

- Livestock (e.g. sheep & cattle) and goats eat palatable woody vegetation.
- This is supported by an extensive body of peer-reviewed science, as well as auditable project-specific data, and results in suppression of woody biomass.
- 89% of the projects we support were subject to multiple forms of suppression in the project baseline and implement two or more management changes as part of the project to facilitate regeneration.

Rangelands properties in Australia are primarily used for grazing, with the main land tenure type in the region for NSW, QLD, WA, SA and NT being pastoral leases**.** Sheep and cattle are the predominant form of grazing, although more recently, there has been increasing presence of feral and domestic goats in southern QLD, NSW, SA and WA**.** There are a broad range of palatable tree species in the rangelands, as outlined in Appendix 1 and 2. When examining the feasibility for a HIR project, Climate Friendly's expert team assesses these palatable species for signs of suppression from grazing and feral animals.

Mulga, *Acacia aneura*, is one of the primary palatable native trees present in the semi-arid "mulgalands" which compose part of the Australian rangelands. Appendix 1 and 2 outline that the palatability of mulga to cattle is rated as "A" (Department of Agriculture and Fisheries, Queensland, 2022), and "High" for goats (Meat and Livestock Australia, May 2007). As the region is semi-arid, there is not consistent pasture or herbage during dry periods. Mulga has been known as the "standing haystack", as it is eaten by stock when the intermittent pasture diminishes or when there is insufficient pasture compared to total grazing pressure.

Continuous and/or heavy grazing of palatable species that are within reach causes a "hedging" or even a "bonsai" effect and can supress and even kill the plant. When the availability of palatable species runs out during drought periods, fodder harvesting, mechanical pushing, pulling, felling or lopping of higher trees commonly occurs to provide drought tolerant feed for cattle, particularly in QLD and NSW.

Peer reviewed science on grazing suppression:

There is an extensive body of peer reviewed scientific literature studying the degradation and suppression of native vegetation in the rangelands from grazing (refer to Appendix 3). A unique 90+ year case study of Koonamore Station in South Australia provides an extensive body of peer reviewed literature on both a) the ability of grazing to suppress vegetation growth and b) how changing practice to remove grazing suppression can deliver forest restoration. Below is a remote sensed image of the impacts of removal of suppression from Koonamore Station, where the profound change to vegetation is clear compared to the surrounding landscape which has continued to be grazed.

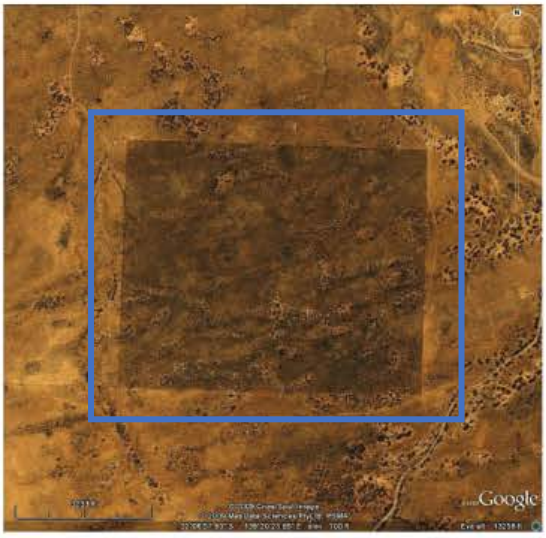


Fig. 1. Aerial view of the reserve, 2009.

Figure 3: Satellite imagery showing the long-term (90yr) effects of grazing management on the vegetation of the TGB Osborne Vegetation Reserve, Koonamore; SA. Materially more vegetation can be observed within the fenced area than in neighbouring properties. Sinclair R. and Facelli, J.M. (2019) Ninety years of change on the TGB Osborn Vegetation Reserve, Koonamore: a unique research opportunity. The Rangeland Journal 41(3): 185-187.

The practice changes implemented on Koonamore are akin to changes being undertaken as part of many HIR carbon projects, and this shows the potential long-term ability of these projects to regenerate the landscape.

Climate Friendly's approach to assessing grazing suppression:

At a project scale, Climate Friendly assesses the effect of grazing on the vegetation by integrating several data sets to compile and assess vegetation growth patterns compared to management practices and climatic drivers of regeneration (e.g. rainfall). Prior to assessing whether specific tree species are being suppressed, staff assess a range of key evidence to assess whether there has been consistent high grazing pressure that is likely to have resulted in suppression and degradation of forest cover. Our approach includes:

1. **High level satellite data:** Analysis of NCAS & SLATS datasets as well as aerial imagery to provide a broad indicator of forest cover change and/or suppression, to guide field data collection.
2. **Stock, trapping and sales records**: Project proponents provide third-party auditable evidence of historical numbers of stock and feral animals/pests through sales and stock rate records. These records are compared to safe grazing calculations to determine how frequently the stock rates have exceeded pasture availability.
3. **Safe-grazing calculator**: Climate Friendly has developed a 'Safe Grazing Calculator' to evaluate and monitor the likelihood of suppression occurring due to sheep and cattle grazing based on records of stock numbers compared to pasture availability. Pasture availability varies overtime according to rainfall and other factors. This indicates periods where livestock are likely to have supressed palatable vegetation. See discussion on question 3, provision of auditable evidence, for more information on our safe grazing calculator approach.
4. **Lack of ground cover**: High grazing pressure can be visible from satellite imagery of ground cover on properties in periods of low rainfall where the pasture body and herbage cover appears heavily grazed or largely absent.

5. **Browse lines**: Browse-lines manifest as uniformly top-heavy vegetation, where the absence of lower branches or foliage indicate that the specimen is being eaten but has reached a height that is out of browsing reach.
6. **Lack of young palatable species**: Properties with clear browse lines also often have a general lack of young age palatable species. This is an indicator of ongoing suppression.
7. **Sightings and density of ferals**: Site visits record the numbers of ferals (goats) sighted on properties, as well we evidence in scat densities or goat harvest and sales receipts.
8. **Heavy use of feed supplements:** Graziers often use feed supplements to promote digestion of less palatable species by livestock. A heavy reliance on feed supplements can therefore be a good indicator of suppression by livestock.
9. **Tree species:** the palatability of the tree species present in a region and on a property is considered to ensure the species have the potential to be suppressed and to form forest cover (refer to next section for further information on forest potential)

Cumulatively, these data and analyses provide important information needed to assess project eligibility and whether or not there has been historical grazing pressure that may have resulted in degradation and suppression. Where high grazing pressure is deemed likely, Climate Friendly then supplements this data and analyses with auditable property specific evidence of grazing impact on regeneration. This commonly includes photographic evidence of grazing suppression on the property. A collection of examples of photographic evidence of grazing-based suppression is presented below. This is a small set of photos from our portfolio to help visualise how grazing suppression looks on the ground. This includes evidence of:

1. **Hedging**: Hedge mulga (and less commonly other tree species) is formed by close and repeated grazing on the young mulga. This results in the trees being clipped into a consistent height, or hedge, from cattle or goats. The hallmarks are a very even height of the young shrub-formed mulga.
2. **Snapped or trampled stems**: Tall stems are often snapped where goats or cattle have reached up on their hind legs and brought down the stem to access the feed at the top. Or smaller trees are commonly trampled for easier access to the palatable vegetation. This is not just suppression on young regeneration, but also active degradation of trees that can contribute to forest cover.
3. **Other stunted growth formations**: the type of suppression commonly varies according to livestock type. Signs in thickened stems and ‘bonsai’ like growth of suppressed palatable vegetation are more commonly associated with sheep and goats. These formations show stunted growth forms with thick base stems, indicating browsing is suppressing regeneration.
4. **Grazing of bark**: Some species have palatable bark, such as Cypress. Eating of the bark can result in suppression or death of the tree. Signs of ringbarking of these species is an indication of degeneration and suppression of forest cover.
5. **Pushing and fodder harvesting:** In periods of drought, mature trees are often used by graziers as a feed stock. This is more prevalent on properties with high grazing pressure and suppresses forest cover.
6. **Fence line comparisons:** photographic evidence of suppression can also include comparisons of the condition between two different paddocks or properties which are separated by a fence. In this instance, the effects grazing management on one side of the fence leading to ongoing suppression is evident compared to an adjacent area of land that has different grazing and/or clearing patterns.

Photos 1 & 2: examples of "hedging" are identified in blue boxes. Palatable woody biomass in a paddock is kept at a consistent height. Shrubs are suppressed from regenerating to become trees due to constant grazing, typically by cattle and goats

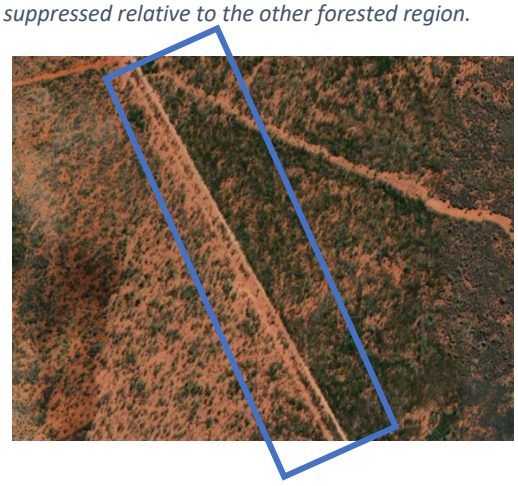
Photos 3 & 4: examples of snapped stems are identified in blue circles. These are typically caused by goats and cattle breaking higher stems to access growing tips, or through physical trampling.

Photos 5 & 6: examples of "Bonsai and thickened stems" are identified within the blue circles. This growth form is caused by continual grazing of individual trees, typically by sheep, keeping them in a 'bonsai' form with highly thickened stems

Photo 7: example of "Ring barking" identified in the below blue circle. This is generally caused when goats eat the bark off palatable trees.

Photo 8 & 9: example of "pushing trees and fodder harvesting" are identified in the below blue boxes. Mulga is often pushed to provide feed for livestock in drought periods, or to increase pasture.

Photos 10 & 11: examples of fence line comparisons in rangelands properties where HIR projects occur are identified in the below blue boxes. They highlight the impact of – different management regimes in regions that otherwise have the same ecosystem and climate conditions. One side of the fence is suppressed relative to the other forested region.



Projects typically involve multiple management changes to remove suppression:

Recent criticisms of the HIR method have focused on whether or not grazing is a valid suppression agent. However, in most HIR projects there are multiple suppression factors prior to project commencement. 89% of the projects we support involve two or more management changes, and over 70% of the projects also including changes to clearing practices. Typically, it is a combination of several interconnected historical factors and a package of management changes that combined lead to positive regeneration outcomes.

Table 1. Management change activities for 124 of Climate Friendly's projects.

Activity	No. Projects	Proportion of CF projects
exclusion of livestock	3	2%
manage feral animals	79	64%
manage timing and extent of grazing	114	92%
cease mechanical or chemical suppression	88	71%

Note that 89% of projects are undertaking two or more management activities.

2. Can vegetation in the rangelands achieve forest cover or are the rangelands regions unable to support forest cover?

Summary:

- The Australian Rangelands can form and sustain acacia forests and acacia open woodland forests which have greater than 20% tree canopy and store carbon

The definition of forest has been considered at length (*IPCC Special Report on Land Use, Land-Use Change and Forestry 2000*). The current use of a cover-based characterisation provides an objective and consistent definition of 'forest' that can be applied globally. The use of crown projective cover (CPC) above 20% was chosen to include both dense forests (closed canopy), in which virtually the entire land surface is covered by tree canopies, and woodlands (open canopy), in which the crowns of scattered trees or groups of trees may cover only some of the land surface. The inclusion of open woodlands is particularly important in the Australian rangelands context.

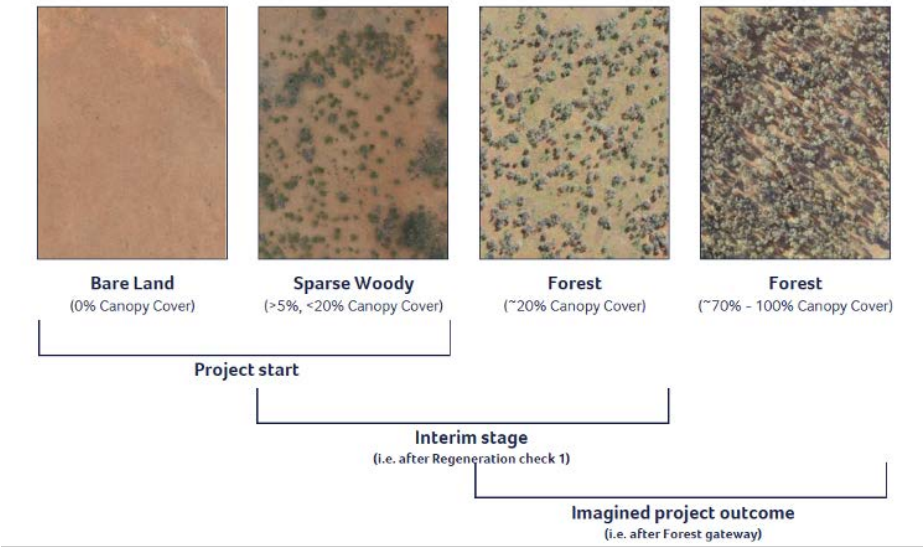
Acacia forests and Acacia open woodland forests, commonly found in the arid and semi-arid rangelands of Australia, have "forest potential", being composed of a number of species that attain height in excess of 2 m tall and canopy cover greater than 20%. Dominant species include lancewood (*Acacia shirleyi*), bendee (*A. catenulata*), mulga (*A. aneura*), gidgee (*A. cambagei*), brigalow (*A. harpophylla*), western myall (*A. papyrocarpa*) and blackwood (*A. melanoxylon*). Canopy species also include members of the box group of eucalypts (*Eucalyptus* section *Adnataria*) that exceed the 2 m height criteria. Many of these species are long lived and sequester substantial quantities of carbon, even as open canopy forest woodland[1].

There are many checks and balances to ensure that land which does not attain forest cover does not get credited. Coinciding with the 2019 HIR Method review conducted by ERAC, the Federal Government legislated an additional key regulatory change in 2019 required each project to attain forest cover by a specified date. If a project does not meet this requirement

[1] Roxburgh, S. H., Karunaratne, S. B., Paul, K. I., Lucas, R. M., Armston, J. D., & Sun, J. (2019). A revised above-ground maximum biomass layer for the Australian continent. *Forest Ecology and Management*, *432*, 264-275.

no further credits will be issued on the portion that has not performed, and it will have to be removed from the project. In parallel, the Clean Energy Regulator introduced new technical guidelines on stratification, evidence and records for HIR projects. This included the introduction of gateway checks to ensure that projects were transitioning towards attainment of forest cover, in line with the intents and purposes of the HIR method. The threshold for the first regeneration check is ≥7.5% crown canopy cover (or crown canopy cover increases 5% over 5 years). Figure 4 below provides an illustrative example of forest cover transition in the rangelands towards "forest cover".

Figure 4: canopy cover stages and comparison to HIR carbon project gateways



Source: CMI Working Paper: Response to Research on HIR Method, HIR Method Review Sub-Committee, April 2022.

3. Do HIR projects provide adequate evidence of suppression pre-project and evidence of the removal of suppression following project commencement?

Summary:

- HIR carbon projects provide auditable evidence of project level suppression and regeneration following the removal of suppression to independent auditors and the Regulator.

Every HIR carbon project is audited by a *National Greenhouse and Energy Reporting Scheme (NGERs)* auditor. These auditors are approved by the Clean Energy Regulator and underpin the integrity of not just carbon project compliance, but also corporate emissions under the *National Greenhouse and Energy Reporting Scheme*. The auditors are themselves audited at regulator intervals by the Clean Energy Regulatory to ensure they are auditing correctly. The Clean Energy Regulator audit framework is also audited by the ANAO from time to time.

Every rangelands HIR project is audited at least three times over its life by these independent auditors to assess compliance with the legislation, with the first audit occurring prior to the first issuance of ACCUs. This includes assessing that there is evidence of suppression, including Climate Friendly's safe grazing calculator, field verification data and associated stocking records (see Box 1), and that there are enough juvenile and/or suppressed trees to grow to attain forest cover. This includes assessment of spatial mapping

which must meet stringent map accuracy assessment requirements, field data, site visits and/or equivalent high-resolution data to validate the status and extent suppression and regeneration of specific areas delineated within projects. It also includes technical reviews of abatement calculations and an assessment of legal documentation, consents and management plans.

Box 1: Climate Friendly's Safe Grazing Calculator

Climate Friendly developed a 'safe' grazing calculator to monitor the impacts of grazing in both the 10-year baseline period and throughout project implementation. This calculator is used to assess stocking rates relative to pasture availability. The calculator uses inputs from stocking numbers and simulated pasture biomass, which is based on site-specific environment and climate data and calibrated to remotely sensed data. Stock data is obtained from quarterly monitoring reports provided by the land manager, and evidenced through auditable datasets, such as receipts. Stock classes are converted to a 'dry sheep equivalent' (DSE) figure based on standard conversion factors.

Safe grazing levels refer to the stocking of the property that will ensure sustainable pasture production, given the climatic and other conditions. Periods above "safe grazing pressure" indicate potential for suppression of vegetation, as livestock and goats will utilise the palatable vegetation in periods of limited pasture availability. By monitoring the likely availability of pasture, this enables us to advise land managers to alter stocking rates to prevent grazing from having a suppressing impact during the project period. This calculator, with accompanying third-party evidence and records related to stock, is used as to provide one part of the evidence base to demonstrate that vegetation was impacted in the baseline period and that management changes which comply with the HIR method have been implemented since project commencement.

While the safe grazing calculator uses environmental data specific to the project area, the calculator should still be considered an indicative model. Supplementary actions, such as purchase of feed, are not considered. The grazing calculator is just one input and source of integrated information used to both assess project eligibility and monitor ongoing impact.

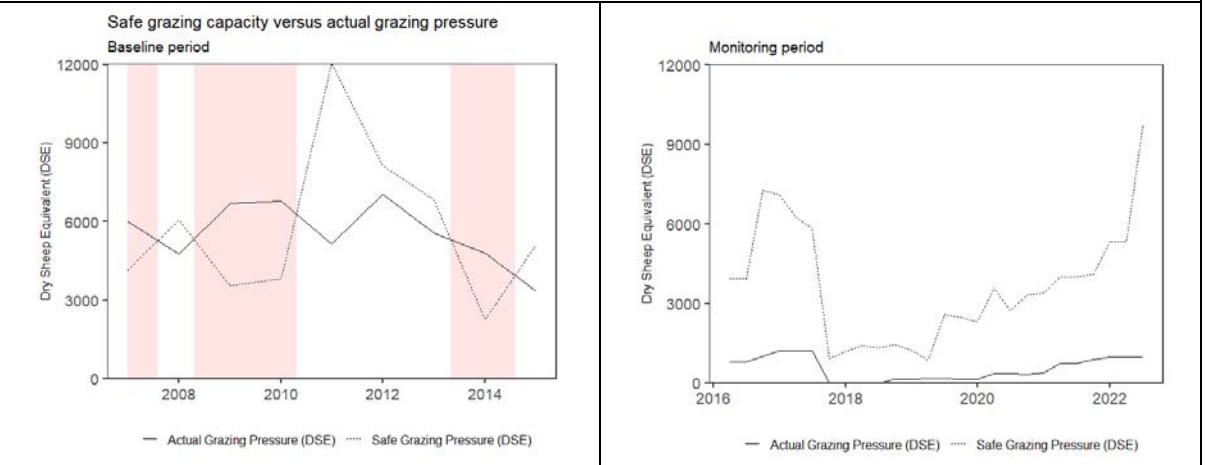


Figure 5. An example of a safe grazing timeseries for a project. In the baseline period, actual grazing pressure (dry sheep equivalent) exceeds safe grazing capacity, indicated by the red shading. This results in the depletion of pasture and grazing suppression of regenerating trees. In the project period, actual grazing pressure remains below safe grazing capacity and pasture levels are not depleted, ensuring that livestock do not graze regenerating trees.

The grazing calculator was initially derived from the following source: Johnston PW, Tannock PR, Beale IF (1996) Objective `Safe' Grazing Capacities for South-West Queensland Australia: Model Application and Evaluation. The Rangeland Journal 18, 259–269. It has been subsequently updated based on emerging datasets and research.

4. Is removal of suppression leading to increase in forest cover in HIR project areas?

Summary:

- There is a clear detectable trend of increasing forest cover in project areas that is correlated with management change to remove suppression factors (over-grazing, clearing and uncontrolled feral animals).
- HIR projects *facilitate* the ongoing growth and survival of trees that has in fact been *triggered* by rainfall and other environmental conditions. They involve removing suppression agents which were stopping forests from regenerating (i.e. rain makes trees grow, management changes remove inhibitors to growth).
- There is no discernible difference in the rate forest regeneration between projects with avoided clearing compared to grazing management as the key practice change. This suggests that both management changes are an equally valid way to sequester carbon.

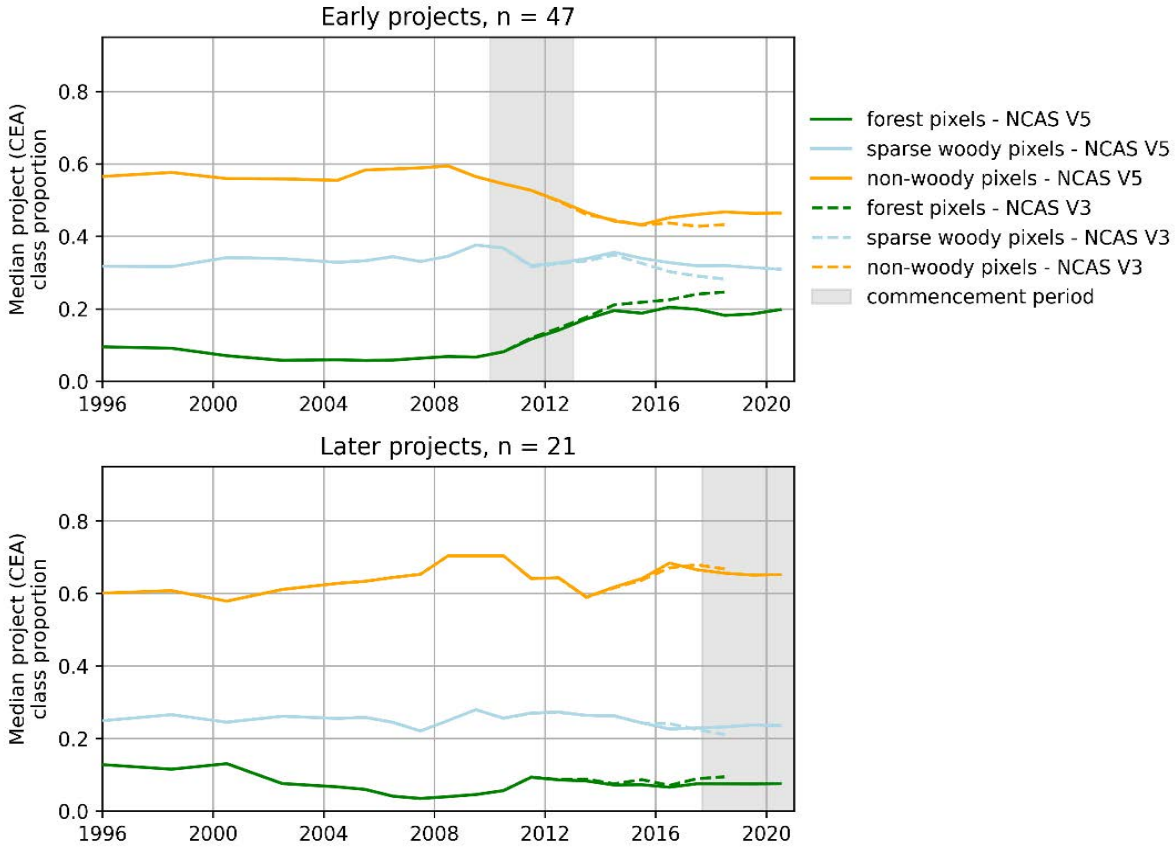
Analysis of carbon estimation areas (CEAs) in similar properties with different project commencement times

Carbon projects should be viewed as *facilitating* the ongoing growth and survival of trees that has in fact been *triggered* by rainfall and other environmental conditions. The interplay between management changes and variable climate conditions can make it challenging to demonstrate the impact of project implementation.

Climate Friendly has attempted to account for these climatic conditions by assessing the performance of HIR projects over three La Niña periods with heavy rainfall. Our analysis includes a comparison of changes in sparse woody vegetation and forest cover within early and later projects in response to high rainfall periods (La Niña) and changes in management practice. The early projects implemented practice changes in the period of 2010-2013, following announcements from the Australian Government of their intention to create land-based carbon farming methods and to include provisions to recognise early action. Evidence of suppression and management changes, as previously described, are collected on both early and late projects, supporting that that suppression has been removed in early projects and continued in later projects. This evidence information has been subject to third party independent audits as part of project implementation. The early projects are in the same regions and rainfall bands as later projects that commenced carbon farming between 2017 and 2021.

This analysis based on NCAS forest and sparse woody classifications is detailed in Appendix 4. The figure below provides an overview of the results. The chosen time scale covers the three main La Niña periods from 1996 (see Appendix 4, Figure 6).

Figure 6: A comparison of forest regeneration in CEAs for 'early' and 'later' HIR projects supported by Climate Friendly shows a clear trend of increasing forest cover corresponding to the change in management for the early projects, and long term suppression during both multiple high rainfall La Niña periods and drought periods for later projects.



Note that NCAS "forest pixels" do not equate to "forest area" but are isolated forest pixels that can contain some larger pre-existing paddock trees. Pixels are classified as forest against a threshold of at least 20% crown canopy cover in the pixel. There must be at least three contiguous pixels for an area to constitute a "forest area" in line with internationally approved definitions of forest in Australia. All forest areas are removed from carbon estimation areas. We also note that Climate Friendly currently utilises Sentinel-2 satellite data which are higher resolution (10x10m pixels) for our human-induced regeneration project mapping, but these datasets are only available back to 2015. For the purposes of time series analysis, we have utilised two different versions of NCAS datasets (25x25m pixels) which are the only long run change datasets available. Further, the above analysis shows that carbon estimation areas contain less than 10% forest pixels at project start. We are not credited for these pre-existing paddock trees. All existing carbon stocks are removed from crediting and the presence of scattered trees is accounted for in the FullCAM model calibration.

The project CEAs of early projects display a clear increase in the growth of forest and in conversion from bare land to sparse woody vegetation, that aligns with the change to management practices. The rate of forest conversion seen here (to around 20% CEA on average) is aligned regeneration check guidelines (which require ~5% increase in canopy over 5 years or supplementary field evidence of regeneration and forest potential) and estimated forest attainment for this cohort of early projects, with some variation between individual projects expected depending on the initial conditions and degree of degradation.

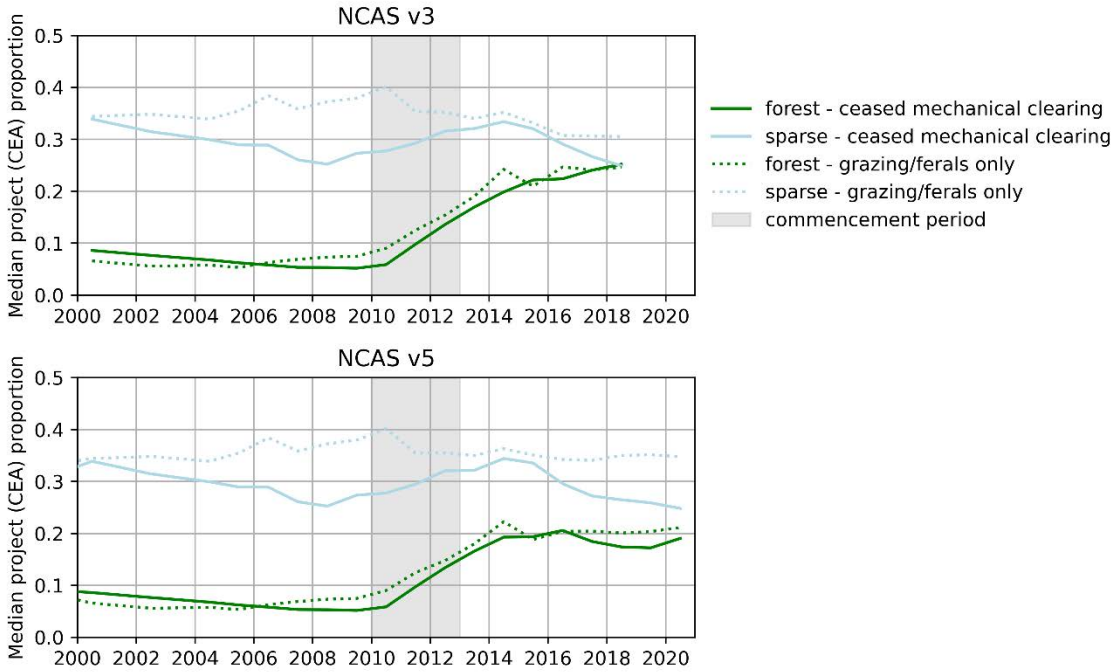
The areas of later projects which are now CEAs show a lack of regeneration over the same period, despite these areas being deemed as having 'forest potential', and despite there being sufficient rainfall through successive La Niña periods for these areas to transition to sparse woody or forest area in the earlier decades. This analysis indicates that CEA mapping is correctly targeting vegetation which has long-run suppression.

We acknowledge that current restrictions on data access mean that this analysis is not easily undertaken by external third parties. Refer to Part 1 of our submission which details our proposal to establish a National Integrated Land Database to help facilitate better analysis in the future, while providing appropriate privacy protections for individual land managers.

Comparison of different management changes: cessation of clearing vs changes to grazing management

Recent commentary on HIR projects has suggested that projects which involve changes in clearing practices are valid, while projects that involve changes in grazing management are problematic. Climate Friendly has completed a comparison of forest growth in carbon estimation areas that included cessation of mechanical or chemical clearing, and projects that only included changes to grazing management. The analysis concludes that there are very similar positive trends in forest regeneration rates in both projects with cessation of clearing and projects that include changes to grazing. The change in forest growth aligns with beginning of management change. This analysis suggests that the impact of grazing practices on suppression and restoration are in fact comparable to restoration due to ceasing land clearing. Further details on this analysis and the selection of projects can be found in Appendix 4.

Figure 7: The rate of forest restoration is consistent between HIR projects which involve changes to grazing management alone, when compared to projects that include a cessation of clearing.



Changes in land clearing practice, alongside changes in grazing management

Rangelands land managers commonly use a combination of grazing and land clearing to suppress the growth of woody vegetation. Land clearing can take many forms including broad scale conversion of forest to pasture, selective clearing within forest areas, repeated clearing of shrubs that have re-grown from past forest clearing and fodder harvesting. Some of these forms of clearing are readily detected with remote sensing, such as the conversion of forest to non-forest, while others are more cryptic and harder to detect remotely.

Land clearing as a suppression agent is relatively common in the rangelands of QLD and NSW, and less common in SA, NT and WA

Figure 8: Example of extensive land clearing in the rangelands (QLD)

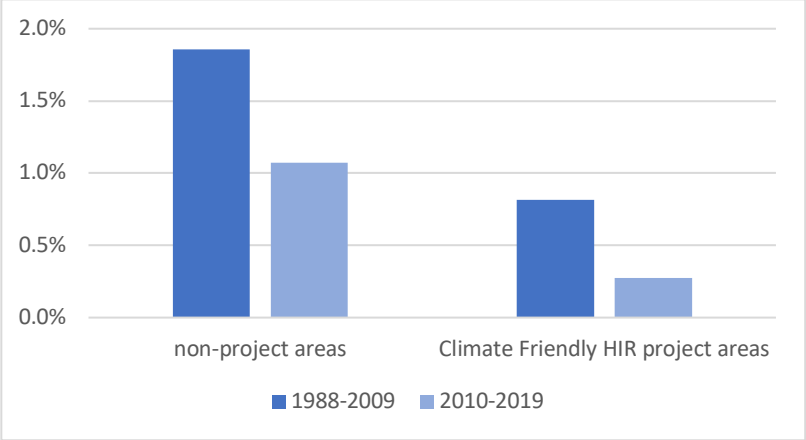
Recent commentary on the HIR method has also suggested that prevalence of clearing in the rangelands regions was low. Our analysis shows that prior to project commencement, there was a material volume of land clearing. It also shows that following project implementation, land clearing within project implementation areas (CEA) has ceased, in contrast to broader regional trends associated with clearing. Further, there is no evidence of within project leakage of clearing, instead rates have reduced across properties with carbon projects even in areas outside the implementation area. Carbon projects are required to commit to store sequestered carbon for a period of 25 or 100 years. This permanence obligation is in contrast to grazed properties not covered by carbon projects and eliminates risks of land clearing in future years.

Climate Friendly completed this analysis of the loss of woody canopy cover within our QLD projects. We used the Statewide Landcover and Trees Study (SLATS) mapping data which detects the location and extent of woody vegetation loss each year. While SLATS mapping data exist for NSW, the detection of disturbance to woody vegetation in NSW appears to be sensitive to changes in the technology and data over time (i.e. it is difficult to conduct time series analysis comparing changes across years in NSW). This means that a consistent comparison of disturbance patterns over long timespans is more difficult to achieve in the rangelands in NSW, hence the focus on QLD.

Registered HIR projects include carbon estimation areas (CEAs) and exclusion areas. Exclusion areas include baseline forest and non-implementation areas that either don't have forest potential or that were excluded from the management change at project start. Assessing clearing rates within project boundaries tests for "leakage" to ensure that any clearing on exclusion areas does not offset changes made in the project. It is important to note that some clearing and thinning is allowed to continue in excluded areas within HIR projects area provided that the levels are not greater in those areas than had generally occurred during the baseline period. Such clearing is often undertaken to maintain fire breaks and road access infrastructure.

When assessing change in clearing rates, we compare two broad time periods: 1988-2009 prior to the implementation of carbon farming projects, and 2010-2019, during which project activities progressively occurred (noting projects had different start dates, which means some clearing in project areas is attributable to the fact that projects had not yet begun to be implemented). We compare the relative change in clearing rates of project and non-project areas over time. The maximum annual clearing rate of all non-project areas declined by 42% between the periods of 1989-2009 and 2010-2019 (Figure 9). A larger reduction of 66% was observed in HIR project areas. Further, the maximum observed clearing rate in non-project areas remains higher (1.1% p.a.) than in HIR project areas (0.3% p.a.).

Figure 9. Comparison of the maximum annual rate of clearing before and after HIR projects commenced.



We note that while a regional clearing level in non-project areas of 1.1% or a pre-project clearing level of 0.8% may sound small, this constitutes a material volume of clearing potential over a 25-year project period. If conducted on an annual basis, this could result in up to 25% of a property being cleared over the life of a project. We note that maximum clearing rates tend not to occur on an annual basis, but are more cyclical based on periods of drought. As such, a range of 5-15% is more likely to represent the historical clearing risk in the rangelands region. While reductions in clearing provide a clear benefit maintaining mature forest and stored carbon in the landscape, these avoided emissions from cessation of clearing undertaken as part of HIR project management changes are not credited.

5. Are HIR projects over credited or conservatively credited when compared to actual abatement? Specifically, are pre-existing trees being credited, or does their presence in the project estimation areas create a risk of over-crediting, or are their sufficient controls to ensure pre-existing trees are taken into account and crediting is conservative?

Summary:

- FullCAM was calibrated with pre-existing trees in the calibration sites and the HIR method has several controls that restrict the possibility of any risk of over-crediting
- Modelled carbon stocks reported for HIR projects focus on a narrow set of eligible carbon pools and are discounted before crediting, following the Offsets Integrity Standard of Conservativeness.
- HIR projects are being issued ACCUs conservatively, and pre-existing trees are appropriately accounted for in abatement calculations.
- The quantum of issued ACCUs to projects we support is less than ground measurements of actual carbon stored carbon in the regenerating forest conducted by CSIRO.

Concerns have been raised that pre-existing trees are resulting in an over-estimate of abatement due to how FullCAM and the method is applied.

Carbon projects CEAs do include pre-existing mature trees. In fact, without these trees, the CEAs would generally not have the viable seed bank required for regeneration to occur. This was well known when the method was written. If all areas with any existing trees were ineligible, human-induced regeneration would not be ecologically possible. Equally, the method requires that there is evidence of forest potential in the form of regenerating trees that are suppressed from growing towards maturity for land to be eligible to generate carbon credits.

The calibration process of FullCAM is well documented[2],[3]. Sites used to calibrate the sequestration rate of natural regeneration included pre-existing trees (median carbon stocks of 6.3 tC/ha). Therefore, the application of FullCAM on sites with pre-existing trees that do not meet the definition of forest is valid.

The key question is whether the impact of pre-existing mature trees on estimates of abatement are accounted for within method deductions and modelling equations. Our analysis shows that there are multiple restrictions in the method and FullCAM application mitigate any concerns that the presence of mature trees might lead to over-crediting.

[2] Paul & Roxburgh (2021) Verification of FullCAM's Tree Yield Formula for Regenerating Systems. *CSIRO*.
[3] Paul & Roxburgh (2020). Predicting carbon sequestration of woody biomass following land restoration. *Forest Ecology and Management*, *460*, 117838.

Are models of abatement conservative?

FullCAM is the key modelling tool used to estimate abatement for HIR projects. The method only credits abatement from a narrow range of carbon pools on these projects that are known to store carbon. The method also includes a range of discounts from calculated abatement, to ensure conservatism. Climate Friendly believe the narrow range of eligible carbon pools, coupled with discounting prior to crediting, results in substantial under crediting when compared to the actual volume of carbon sequestered or emissions avoided on these projects that result from the management change.

When considering the claims of over-crediting, we feel it is important to note the range of abatement sources on the ground that are presently not eligible to generate carbon credits.

Present sources of on the ground abatement that are not eligible for carbon credits under the HIR method include:

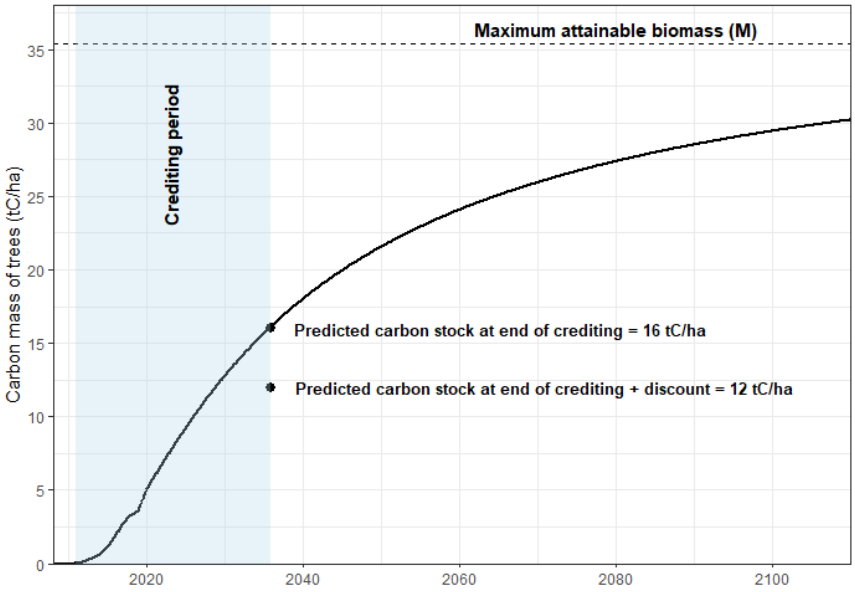
1. Regeneration of suppressed trees in the project areas that have over 20% tree cover at project commencement,
2. Regeneration of shrublands that are unable to attain forest cover.
3. Standing deadwood is not currently included in modelled abatement.
4. Decay rates of dead wood are assumed to be 7-11 years, when field research suggests they are in fact many decades. This reduces eligible abatement.
5. Soil carbon stored in projects is ineligible.
6. Reduced methane emissions from lower stock densities is ineligible for most properties.
7. Avoided emissions from changes in clearing practices, as covered in the section above.

The reason these additional forms of abatement were ineligible in the HIR method is in large part due to when the rules where developed. The HIR method was developed during the Kyoto Protocol period which had a detailed set of accounting rules based on specific activities. This led to the development of discrete methods covering a sub-set of carbon pools and specific activities. These rules have been updated the Paris Accord, which takes a more holistic approach to carbon accounting across a landscape.

Carbon projects also are also generally deducted another 25% of modelled abatement due to a 5% risk of reversal buffer and a 20% permanence discount for projects with a 25-year permanence period (Figure 10).

Combined, the HIR method leads to highly conservative crediting of abatement compared to on ground management changes and impacts. While consistent with the Offsets Integrity Standards, it is likely that the current crediting approach is overly conservative and in our view in fact leads to under-crediting of changes implemented by land managers.

Figure 10. Example of the Tree Yield formula underpinning FullCAM models of natural regeneration. Maximum attainable biomass (M) is converted from tonnes of aboveground biomass to tonnes of total carbon stored in trees. The eligible abatement of HIR projects is calculated at the end of the 25 year crediting period. Eligible abatement is calculated as the predicted 25 year carbon stock, less any initial carbon stocks, risk of reversal buffers or permanence discounts. In this example, the eligible abatement is 34% of M. Growth toward M is shown to asymptote (i.e. slow down) over the long-term.



Does FullCAM and its application under- or over-credit abatement on the ground?

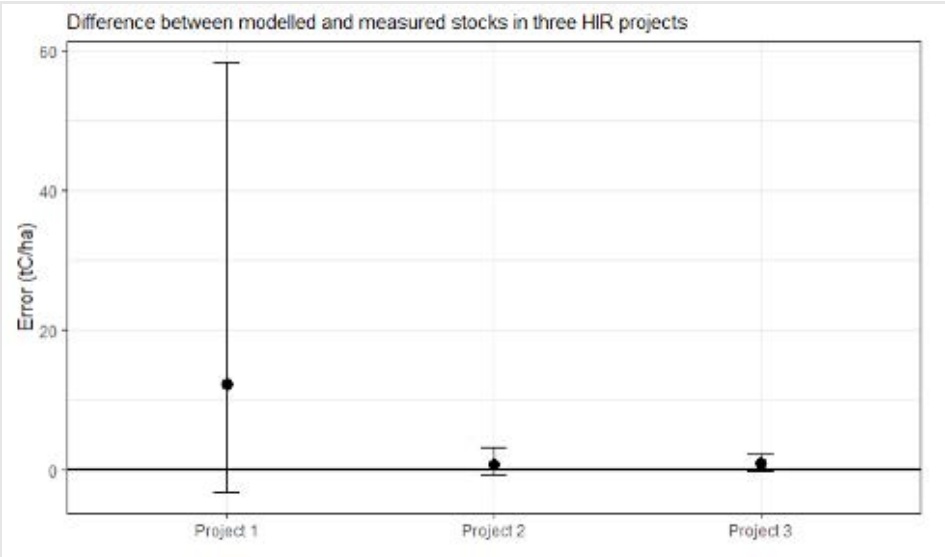
Climate Friendly notes the proposed inclusion of an option for validation measurement in the Integrated Farm Management method which is currently under development. We support the inclusion of this option, which will enable land managers to receive credits in line with actual impacts of their management changes, which we believe are currently in excess of the abatement modelled by FullCAM.

Our analysis in Figure 11 below demonstrates this conservatism using measurements taken by CSIRO on a sub-set of our projects and comparing the measurement to carbon abatement modelled on the same projects using FullCAM.

CSIRO collected 81 validation transects in 2021 located within carbon estimation areas on three HIR projects in Climate Friendly's project portfolio. Plots were chosen by CSIRO to reflect a range of suppression, clearing and regeneration histories. Following the calibration protocol of the Tree Yield Formula, remnant or pre-existing trees are excluded to obtain a measurement of carbon stocks associated with regeneration following project management change. The upper size limit for regeneration is described in Paul et al (2021)[4].

[4] Paul & Roxburgh (2021) Verification of FullCAM's Tree Yield Formula for Regenerating Systems. *CSIRO*.

Figure 11. Comparing measured and modelled carbon stocks associated with regeneration demonstrates that modelled carbon stocks are conservative, even before discounting is applied. Error is calculated as the measurement minus the modelled carbon stock for each of 81 transects across three projects. The point is the mean error and the lines show the range of errors within each project. Values above zero show that measured stocks are above modelled stocks.



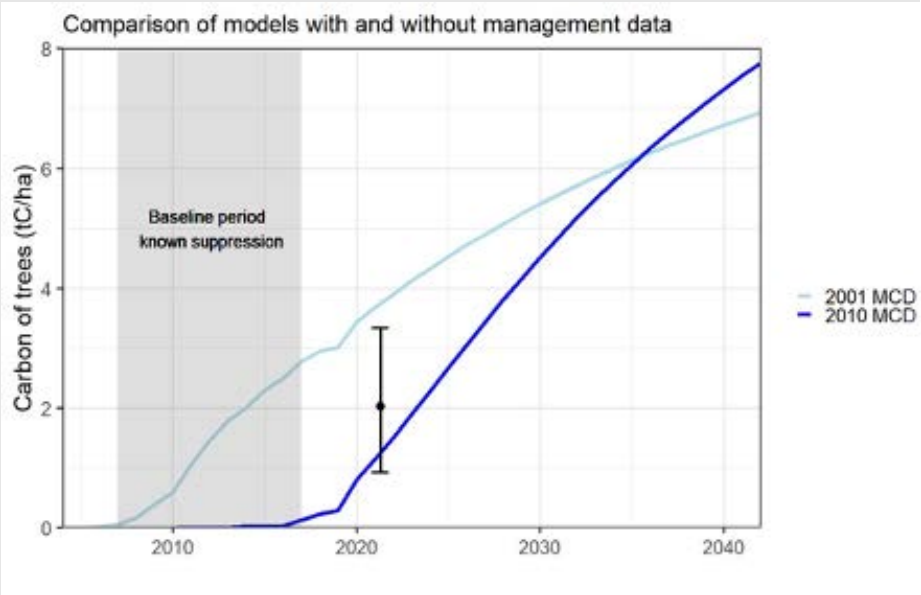
FullCAM models were created by Climate Friendly following the HIR FullCAM Guidelines to calculate the eligible project abatement. These models reflect the project stratification, management history and the ecosystem dynamics of rainfall driven episodic recruitment. Climate Friendly's abatement modelling has been reviewed by an external auditor. We consistently observe measured biomass is greater than the modelled biomass used to calculate eligible carbon credits under HIR.

Pre-existing or remnant trees are not included in transect observed biomass. Therefore, this comparison demonstrates that FullCAM is conservative when used to estimate carbon stocks associated with regeneration. Presence of remnant vegetation within CEA areas does not appear to result in over-crediting.

Are management changes being modelled correctly?

In the analysis of Paul et al (2021) a second set of FullCAM models were generated that assuming regeneration occurred without suppression. The purpose of this model was to locally validate the Natural Regeneration calibration of FullCAM, but it is illustrative to demonstrate the importance of including auditable, time series management data in modelled estimates of abatement.

Figure 12. Comparing two different approaches to modelling – one with (dark blue) and one without (light blue) detailed management information on a single property. The last known clearing event was in 2001. The model without management information assumes that trees grew unsuppressed following clearing, using a model commencement date (MCD) of 2001. The model with management information assumes an MCD of 2010, following the first major rainfall event following clearing. The black point and lines show measured carbon stocks taken in CSIRO transects. The model with management information is a good and conservative fit compared to measured carbon.



This analysis demonstrates how detailed, site specific local management information is key to appropriately modelling eligible abatement. Detailed management data is submitted as part of every project offset reports but is unavailable to external researchers and analysts. See Part 1 of our submission for further information on how this might be rectified through a National Integrated Land Database with appropriate land manager privacy protections.

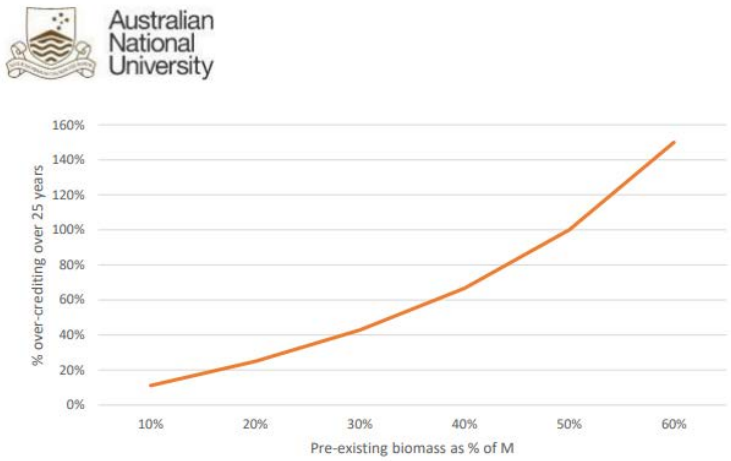
In Figure 12, the model with management information is an example of how Climate Friendly models carbon abatement using FullCAM and detailed timeseries management and rainfall data across our HIR portfolio. Because the CEA was heavily stocked during the baseline period (until 2017) the growth of regenerating trees was suppressed. Growth pauses are applied in the model to reflect this. The land manager decided to commence a carbon project in 2017 and made management changes to remove the suppression of regenerating trees, allowing the vegetation to then grow unsuppressed.

The measurements of regenerating biomass, taken by CSIRO in 2021 correspond with our modelling approach showing that the modelled abatement is conservative compared to the actual regenerating carbon stocks. The model assuming unsuppressed regrowth since last clearing event is inconsistent with observed regenerating carbon stocks.

Are pre-existing trees adequately accounted for in calculations of eligible abatement?

MacIntosh et al. (2022) Integrity and the ERF's Human-Induced Regeneration Method: The Measurement Problem Explained; *Australian National University* use the following graph to communicate their concern regarding potential risk of over crediting projects due to existing woody vegetation at the commencement of projects.

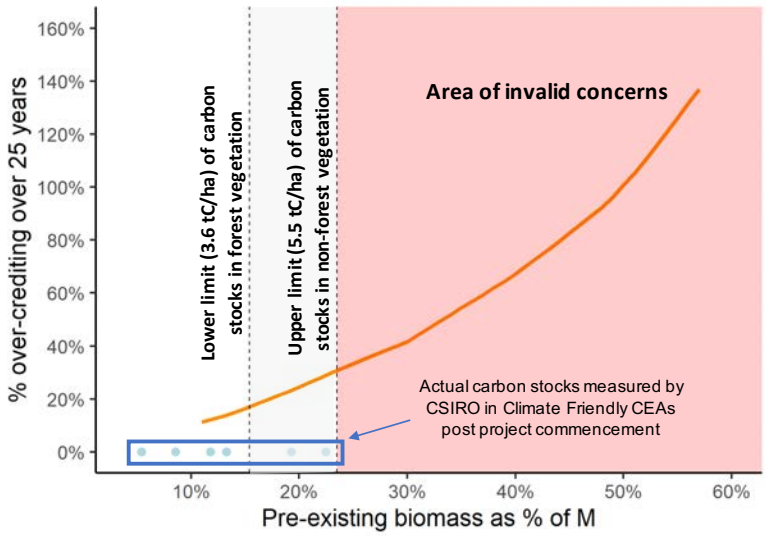
Figure 13. Reproduced from MacIntosh et al.



Lamour et al. (2018)[5] cite the theoretical maximum biomass corresponding to forests with over 20% cover. Stands are found to have carbon stocks between 3.6 and 5.5 tC / ha at forest attainment.

The HIR method requires that areas of baseline forest are excluded. This means that HIR carbon estimation areas must have less than 20% cover. By logical extension, CEAs must have less than 5.5 tC / ha. Figure 14 overlays these constraints on Figure 13 to highlight the overstatements around any potential over-crediting risk.

Figure 14. Key data points overlaid, with reference to measured carbon stocks in Climate Friendly Carbon Estimation Areas. Concerns raised regarding over crediting due to pre-existing trees do not appropriately factor in existing scheme controls.



[5] Larmour, J., Davies, M., Paul, K., England, J., Roxburgh, S. (2018) Relating canopy cover and average height to the biomass of the stand. Report prepared for the Department of the Environment and Energy. CSIRO Land and Water, Canberra.

The first key point missed by MacIntosh et al. is that all areas with greater than 20% canopy cover at commencement are ineligible and must be removed from the CEA. This is ensured via stringent technical guidelines outlining required accuracy of mapping forest areas. Analysis of maximum biomass (M) in the regions where Climate Friendly supports HIR projects show that areas below the forest cover threshold must be below 24% of M. This is the line represented as the Upper Limit (5.5 tC / ha) of carbon stocks in non-forest vegetation in Figure 14. We stress that this is the absolute theoretical maximum potential for over-claims and would require every project CEA to have 19.99% canopy cover and have the most carbon dense relationship between canopy area and total carbon stocks possible. In our experience, a project with this level of canopy cover would not pass independent audit. A less dense canopy area-to-carbon stock relationships, which would be common in the rangelands, would mean that areas just below the forest cover threshold would be at most 15% of M. Again, this is a theoretical maximum and this is represented as the Lower Limit (3.6 tC / ha) of carbon stocks in forest vegetation in Figure 14.

In fact, actual regenerating carbon stocks measured and reported on Climate Friendly CEAs are significantly lower. The dots overlaid on the graph show actual CSIRO measurements of regenerating biomass, estimated using tree size inventory and allometry. These observations were made after project commencement, with some of the sites measured already having several years of project implementation. All measured stocks were still below 5.5tC threshold at this point in project implementation and, as per analysis in the above section, there has been no over-crediting of biomass compared to actual carbon stored.

Future method development

Summary:

- Note the potential of the Integrated Farm Management method to scale up land-based carbon sequestration using the latest science and technology, informed by lessons from implementation of land-based carbon projects to date, and support finalisation of this method as a priority.

Tackling climate change will require significant scale up of carbon storage in the land sector, as identified by the IPCC in its latest report. New methods should build on experience and successful implementation of land-based carbon method, such as the HIR method, to date. They should also address barriers to participation.

Climate Friendly believes the continued development of the Integrated Farm Management method, which is currently in early stages of co-design, should be prioritised to achieve this goal. This holistic agricultural production and land management method establishes can establish a Paris-aligned 'whole-of-landscape' accounting framework combining vegetation and soil methods to allow land managers to implement multiple carbon farming activities on a single property. This would enable increased participation of smaller land managers in the ERF, scale up participation in higher rainfall regions which typically have smaller farm sizes and mixed-farming enterprises, and in general significantly scale up carbon abatement and ACCU supply nationally.

This method should be informed by the Blueprint which was developed with input from carbon, agriculture, technology, resources and conservation sectors, with inputs from Traditional Owner groups, State and Federal Government and researchers and is available here: https://carbonmarketinstitute.org/app/uploads/2021/08/AL-MAP-Method-Blueprint_final.pdf.

Appendix 1: Palatability of rangelands species to cattle

Excerpt from (Department of Agriculture and Fisheries, Queensland, 2022), showing the palatability of various native vegetation to cattle.

Common name	Palatability	Nutritive Value	Comments
Currant bush	C	B	Not readily eaten
Desert gum or cabbage gum	B	B	Eaten fairly readily
Doolan	B	B	May be toxic to hungry stock
Gidyea	C	B	Not much in the area. Best to feed by fire to lift acceptance. Good results if eaten
Green wattle	X	X	Not touched by cattle
Ironbark	B	C	Eaten fairly readily when supplemented with urea/molasses
Kurrajong	A+	A	Has laxative effect. Very palatable and one of the best to feed
Leopardwood	A	A	Well eaten - short supply
Limebush	C	B	Young plants are unpalatable
Mimosa bush	B	A	Grazed by sheep
Mulga	A	B	Well eaten and a plentiful supply in south-west Queensland. Dense stands make easy pushing and cutting
Myall	A	B	Well eaten
Myrtle tree	B	B	Readily eaten by sheep and cattle
Old man saltbush	A+	A+	Self harvested
Plumwood or true sandalwood	A+	A+	Short supply
Popla box	C	C	Eaten if nothing else

Appendix 2 Palatability of rangelands vegetation species to goats

Palatability of an excerpt of “weeds” to goats (Meat and Livestock Australia, May 2007).

The palatability of weeds (not necessarily endemic to Australia) to goats when weeds are grown in Australia.

Botanical name	Common name	*	Botanical name	Common name	*
Acacia aneura	*mulga*	H	*Asclepias curassavica*	*redhead cotton bush*	N
Acacia escelsa	*ironwood*	M	*Asphodelus fistulosus*	*onion weed*	N
Acacia farnesiana	*mimosa bush*	M	*Atalaya hemiglauca*	*whitewood*	H
Acacia glaucescens	*coastal myall*	T	*Atriplex spp*	*saltbush*	M
Acacia karoo	*karoo thorn*	L	*Atropa belladonna*	*deadly nightshade*	T
Acacia mearnsii	*black wattle*	H F	*Avena spp*	*wild oats*	H
Acacia nilotica	*prickly acacia*	M	*Baccharis halimifolia*	*groundsel bush*	H
Acacia homalophylla	*yarran*	M	*Bambusa spp*	*bamboo*	H R
Acacia paradoxa	*kangaroo thorn*	M	*Bidens pilosa*	*cobblers peg*	H
Acaena ovina	*sheeps burr*	M	*Brachychiton populneum*	*kurrajong*	H
Acetosa sagittata	*turkey rhubarb*	H	*Brassica tournefortii*	*wild turnip*	H
Aconitum napellus	*monkshood*	T	*Bromus diandrus*	*great brome*	H R
Acroptilon repens	*hard head thistle*	M	*Brugmansia candida*	*angels trumpet*	T
Aesculus	*horse chestnut*	M	*Bursaria spinosa*	*jimmy burn*	H
Agapanthus spp	*agapanthus*	L	*Buxus spp*	*box hedge*	M
Agave spp	*century plant*	L	*Caesalpina spp*	*bird of paradise*	N
Ageratina adenophora	*crofton weed*	M	*Calicotome spinosa*	*spiny broom*	M
Ageratum houstonianum	*blue billygoat weed*	M	*Callitris columellaris*	*cyprus pine*	H
Ageratum riparia	*mistflower*	M	*Callitris endlicheri*	*black cyprus pine*	H
Ailanthus altissima	*tree of heaven*	L	*Calotropis procera*	*rubber bush*	N
Alhagi pseudalhagi	*camel thorn*	M	*Cannabis sativa*	*indian hemp*	H
Allium triquetrum	*three corner garlic*	L	*Capparis mitchellii*	*white orange*	H
Allium vineale	*wild garlic*	L	*Capsella bursa-pastoris*	*shepherds purse*	M
Alternanthera pungens	*khaki weed*	L	*Cardiospermum spp*	*balloon vine*	N
Amaranthus spp	*amaranth*	M	*Carduus nutans*	*nodding thistle*	M F
Ambrosia artemisiifolia	*annual ragweed*	M	*Carduus pycnocephalus*	*slender thistle*	M F
Ambrosia confertiflora	*burr ragweed*	M	*Carex spp*	*sedge*	M F
Ambrosia psilostachya	*perennial ragweed*	M	*Carthamus lanatus*	*saffron thistle*	M F
Ambrosia tenuifolia	*lacy ragweed*	M	*Carthamus leucocaulos*	*glaucous star thistle*	M F
Ammi majus	*bishops weed*	M	*Cassia artemisioides*	*silver cassia*	L
Amsinckia spp	*amsinckia*	N	*Cassia eremophila*	*punty bush*	N
Andropogon virginicus	*whisky grass*	M R	*Cassia floribunda*	*smooth cassia*	M
Angophora spp	*angophora*	M H	*Cassinia arcuata*	*sifton bush*	L
Anredera cordifolia	*madeira vine*	L	*Casuarina cristata*	*belah*	H
Apophyllum anomalum	*warrior bush*	H	*Cenchrus echinatus*	*Mossman river grass*	M R
Araujia hortorum	*mothplant*	M	*Cenchrus spp*	*spiny burrgrass*	M R
Arctotheca calendula	*capeweed*	H	*Centaurea melitensis*	*cockspur*	L
Argemone mexicana	*Mexican poppy*	N	*Centaurea nigra*	*black knapweed*	M
Aristida spp	*wire grass*	M	*Centaurea solstitialis*	*st Barnaby thistle*	M F
Asclepias spp	*cotton bush*	N	*Cestrum parqui*	*green cestrum*	T

Appendix 3: Key references related to grazing suppression in the rangelands

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Appendix 4 – Detailed analysis on how management changes to remove suppression agents have impacted forest regeneration in carbon estimation areas

Purpose: to assess the impact of removal of suppression agents on forest regeneration in early HIR projects supported by Climate Friendly.

Summary:

- Regeneration of woody vegetation in CEAs is related to management change, not rainfall alone.
- Indicative evidence of regeneration and suppression is broadly consistent with estimates of safe grazing exceedance.
- Suppression and regeneration of woody vegetation in CEAs was not notably different for rangeland areas with higher and lower productivity.
- Suppression and regeneration of woody vegetation in CEAs was not notably different for projects that ceased mechanical or chemical suppression compared with those that only altered the management of stock or feral animals.

Introduction:

Overview

The CFI has been operating for nearly a decade and there is an increasing body of data and information available to evaluate the on-ground impact of Human-induced Regeneration (HIR) projects. For an early cohort of projects whose commencement was backdated[6], there have now been ten or more years since management changes were implemented. While this is still early to observe trends in rangelands forests systems given their slow growing nature, this time period is likely to be sufficient time for signals of change changes in woody vegetation to be detectable in long-running remote sensing datasets (e.g., products derived from Landsat satellite imagery which is the only long running time series dataset available).

Using the Landsat-based National Forest and Sparse Woody Vegetation dataset, formerly produced under the National Carbon Accounting System[7] (hereafter: 'NCAS'), along with supplementary environmental and management data, the aim of this analysis was to evaluate changes to forest area and sparse woody vegetation in project Carbon Estimation Areas (CEAs) since project start. The study described below was designed to control, where possible, for the influence of climate and land management on tree growth, among other factors.

[6] These projects implemented management changes following announcements from the Australian Government of their intention to create land-based carbon farming methods and to include provisions to recognise early action. These management changes are evidenced by auditable data.

[7] Furby, S. (2002). Land Cover Change: Specification for Remote Sensing Analysis, National Carbon Accounting System, Technical Report No. 9.

The key questions addressed were:

- Is there evidence that management changes in early HIR projects have facilitated regeneration?
- Are there indications that CEAs in both early and later projects have been subject to long-run suppression?
- What is the relative impact of suppression from grazing pressure alone when compared to projects that include clearing suppression (cessation of mechanical and chemical suppression)?

Hypotheses

It is important to consider what temporal patterns should realistically be expected in relation to project start dates and the influence of climate on tree growth. Three important assumptions are laid out below:

1. HIR CEAs must have forest potential. In accordance with the Government *Guidelines on Stratification, Evidence and Records for HIR Projects*, this means that they must have sufficient regenerating stems per hectare and/or > 5% canopy cover. They must also not be forest at project commencement, so must have < 20% canopy cover provided by trees >= 2 m in height. This means that individual Landsat pixels within CEAs are expected to contain a variety of initial tree densities (see response to question 5 above for an explanation of why a small number of existing mature trees does not overestimate carbon abatement).
2. Management changes implemented as part of HIR projects do not *cause* growth, they remove *inhibitors* that were suppressing growth. That is: in the absence of the carbon project and associated practice changes, continuation of baseline land management practices reduces tree survival, reduce recruitment of new trees, and/or prevents woody biomass from growing (suppression). Management changes associated with the carbon project lead to the removal of these inhibitors or suppression agents, and therefore allow woody biomass to grow larger and/or live longer (removal of suppression). So, regeneration can be 'induced' by the carbon project, but this should not be taken to mean the projects are *driving* tree growth or recruitment. Rather, the trees grow due to rainfall and other environmental factors, enabled by management changes. This is an important nuance.
3. When HIR CEAs are initially defined or stratified, suppression is evidenced by multiple integrated and complementary data sources as outlined earlier in this submission.

Integrating these discussions of forest attainment, management & climate interactions and CEA stratification yields the following four hypotheses:

1. Increases in pixels meeting the criteria for 'forest' should be moderate in the early years of a project.
2. Detectable regeneration should be traceable (initially) to suitable rainfall events combined with or followed by changes to remove suppression agents.
3. Removal of suppression should increase the likelihood of regenerating vegetation being preserved and possibly continuing to grow through dry periods when pasture is scarce.
4. Project CEAs should have consistently low numbers of forest pixels over multiple high rainfall (La Niña) events prior to management changes indicative of long run suppression.

Hypothesis 1 highlights the importance of a) targeting analyses within CEA boundaries (which are not publicly available) where incremental amounts of forest gain would be detectable; and b) simultaneously analysing patterns in the sparse woody and non-woody classifications along with forest to obtain a more complete picture of changes within CEAs.

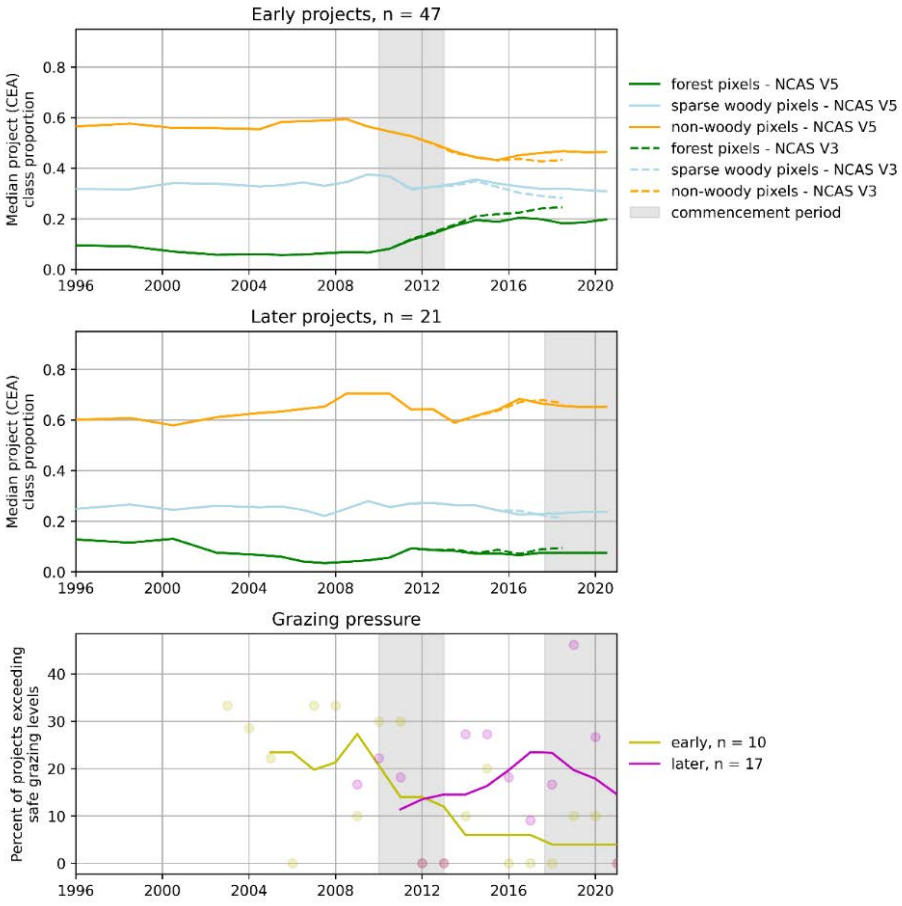
Detailed methods are described at the end of this Appendix.

Results and discussion:

NCAS and safe grazing – overview for early and later HIR projects in NSW and QLD

The cohort of early projects displayed an initial upward trend in forest pixels following implementation of the management change, reaching between ~12-15% above 2009 levels by 2014 (Figure 1). NCAS v5 data suggests that forest area stabilised during the dry periods that occurred after 2013, while NCAS v3 shows a slight continuation of forest expansion (to ~18% above 2009 levels on average by 2018), despite the dry conditions (Figure 1). Rainfall during the 2016/2017 La Niña event apparently did not trigger sufficient growth for many pixels to transition between categories, and the latest NCAS outputs (2018-2020) could not show the impact of very recent rainfall events (mid-2020 onwards). The observed forest attainment in the early project cohort (up to 18% of CEA within a typical project by 2018), is broadly consistent with the expected of rates of forest formation discussed in the introduction.

Figure 1. Top: The annual median proportion of project CEAs in each NCAS category for early projects whose management change occurred from 2010-2013 (indicated by the grey shading). Middle: As for the top plot but instead showing results for later projects whose management change was implemented after September 2017. Bottom: summary of grazing data from a selection of the early and later cohorts, shown as the percentage of each sample that exceeded safe grazing levels within a given year (points) with a five-year moving average shown (lines) to capture the overall trend in grazing pressure.



Note that NCAS "forest pixels" do not equate to "forest area" but are isolated forest pixels that can contain some larger pre-existing paddock trees. Pixels are classified as forest against a threshold of at least 20% crown canopy cover in the pixel. There must be at least three contiguous pixels for an area to constitute a "forest area" in line with internationally approved definitions of forest in Australia. All forest areas are removed from carbon estimation areas. We also note that Climate Friendly currently utilises Sentinel-2 satellite data which are higher resolution (10x10m pixels) for our human-induced regeneration project mapping, but these datasets are only available back to 2015. For the purposes of time series analysis, we have utilised two different versions of NCAS datasets (25x25m pixels) which are the only long run change datasets available. Further, the above analysis shows that carbon estimation areas contain less than 10% forest pixels at project start. We are not credited for these pre-existing paddock trees. All existing carbon stocks are removed from crediting and the presence of scattered trees is accounted for in the FullCAM model calibration.

The trend of pixels transitioning to forest was broadly mirrored in a decrease in the proportion of bare/non-woody land. The median proportion of sparse woody vegetation remained relatively stable (Figure 1). The decline in the median non-woody proportion appeared to begin around 2008 (corresponding with a slight uptick in sparse woody) (Figure 1), likely in response to recruitment events in some locations being triggered by healthy rainfall in 2008. The overall trend through the project period indicates that until 2016 bare or non-woody land was converting to sparse woody, while other sparse woody areas were converting to forest, keeping the sparse category balanced. The non-woody category stabilised in the dry period following 2016. There is insufficient data to assess the changes expected to result from rainfall post-2020.

The pre-baseline and baseline period of later projects displayed a small decline in forest pixels during the millennium drought following the 1998-2001 La-Niña event, plus a comparatively smaller increase in forest pixel area around the 2010-2012 La-Niña period (with a corresponding drop in bare pixels). This trend plateaued around 2012 (at ~ 5% above 2009 levels on average), sooner than the plateau seen in the early project cohort. Non-woody pixels showed a slight increase during the ensuing dry periods (while the same category was stable in the median of earlier projects). This is consistent with the expectation that the protection of woody vegetation under management would be visible during drought periods when woody vegetation would most likely be suppressed.

Considering only forest pixels, the striking contrast between the trends of early (increasing) and later (stagnant) CEAs alone cannot be used to infer that forest conversion was more substantial than it would have been in the absence of a carbon project. This is because, by definition, any areas that might have become forested (including meeting the minimum area of 0.2 ha) through this period would be excluded from the CEAs of the later projects. However, the data is nevertheless *consistent* with this picture. Furthermore, the same selection bias does not apply to pixels that transitioned from non-woody to sparse woody. Thus, the larger net conversion from non-woody to sparse seen in early CEAs compared to later CEAs (Figure 1) supports the interpretation that management changes were impactful.

Stocking records from a subset of the early project cohort (n = 10) showed that grazing pressure ran above safe levels intermittently during the baseline periods (pre-2010/2011/2012). This occurred less often during the project periods (post-2012) with typical stocking rates being more comfortably within safe levels after project commencement (Figure 1). Simultaneously, grazing data from the baseline periods of 17 later projects suggested many properties were running above safe grazing limits during the same period, particularly from 2014-2016 (Figure 1).

Thus, collectively this data:

a) Is consistent with and supports the interpretation that management change facilitated enhanced regeneration in early projects following sufficient rainfall in 2010-2012;
b) Highlights the preservation of sparse woody vegetation during dry periods when suppression might otherwise be expected;
c) Suggests that CEA mapping is adequately identifying areas with the potential to reach forest criteria; and
d) Supports the interpretation that suppression by grazing impeded the regeneration of later projects' CEAs through their baseline period, despite there clearly being sufficient rainfall for regeneration across the region, and despite these areas being identified as having forest potential.

Although the findings presented above suggest that management changes implemented as part of HIR projects have a meaningful impact on the progression of rangeland areas toward forest cover that cannot be explained by rainfall events alone, this has only been a high-level summary of project performance from a sample of Climate Friendly's portfolio. Each project exists with a unique set of circumstances. As such, project specific analysis which is provided to auditors and the Regulator presents a better perspective of the impact of a specific project.

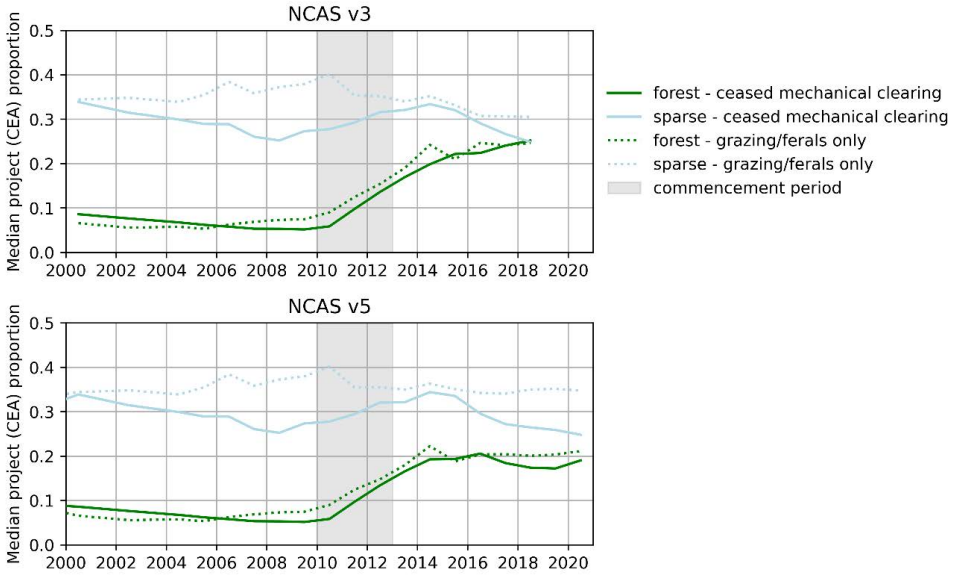
Accounting for other variables

Considering only the early project cohort, three further analyses were completed by stratifying projects according to:

(a) Whether the HIR management change was managing grazing pressure (from livestock and/or feral animals) alone, or whether the changes included a combination of grazing management plus the cessation of mechanical and chemical suppression;
(b) State boundaries – since regional clusters of projects with similar management change exist (e.g., a high number of projects in NSW are managing feral animals); and
(c) Areas of higher and lower productivity (indicated by simulated pasture growth from 2000 to 2022)

Neither version of NCAS shows a notable difference in forest cover proportions for the early cohort when properties were split according to whether implementation included the cessation of clearing (chemical or mechanical) (Figure 2). The typical mapped proportion of sparse woody vegetation was higher and more stable in projects managing stock and feral animals only (Figure 2).

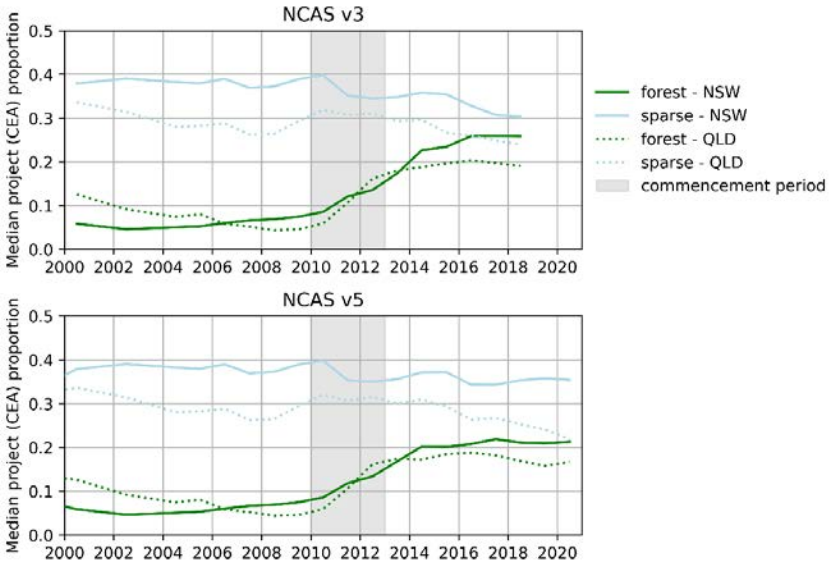
Figure 2. Trends in sparse woody and forest pixels in the CEAs of early projects, split according to whether management changes included the cessation of mechanical clearing or else only the management of stock and feral animals. Category proportions were first aggregated within CEAs of specific projects, then summarised across projects with the median value for each year.



Note that management changes and suppression types/figures are reported for entire CEAs and we have summarised changes in land cover at a comparable scale, while noting that changes within CEAs can vary spatially. Furthermore, unlike the grazing data presented, only the presence/absence of suppression from feral animals or clearing was accounted for here, not the extent or degree.

Stratification by state boundaries yielded qualitatively comparable results to stratification by management type, with trends in forest area being broadly comparable between QLD and NSW (Figure 3). That said, projects in NSW displayed marginally higher forest attainment and higher coverage of sparse woody vegetation. Overall, the results indicated that the recovery of sparse woody vegetation can be induced by management change regardless of the major form of suppression.

Figure 3. Trends in sparse woody and forest pixels in the CEAs of early projects, split according to state boundaries (NSW and QLD only). Category proportions were first aggregated within CEAs of specific projects, then summarised across projects with the median value for each year.



For each project, estimated pasture growth was averaged between 2000 and 2022. Projects were partitioned into 'higher' or 'lower' productivity groups (Figure 4). This was to test whether differences in woody biomass regeneration could be caused by differences in productivity (rather than the management change) by re-analysing early projects in lower and higher productivity sub-groups.

Trends in forest, sparse woody and bare/non-woody were broadly consistent between the higher and lower productivity groups (Figure 5). This analysis suggests that differences in average productivity do not explain the trends in the broader analysis above.

Figure 4. Histogram of average simulated pasture growth for the period of January 2000 to July 2022, shown for the early project cohort (see methods). The dashed line is placed halfway between the maximum and minimum values and was used to split projects into lower and higher productivity groups.

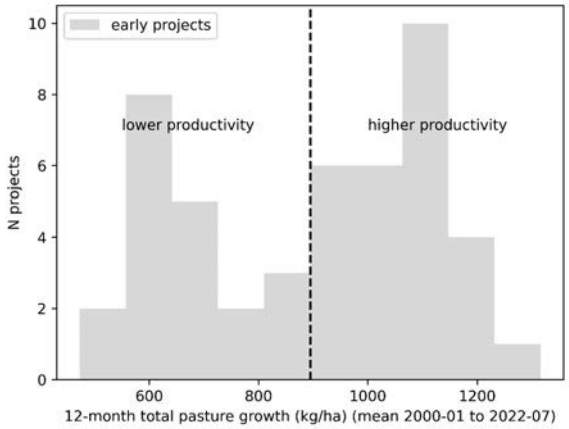
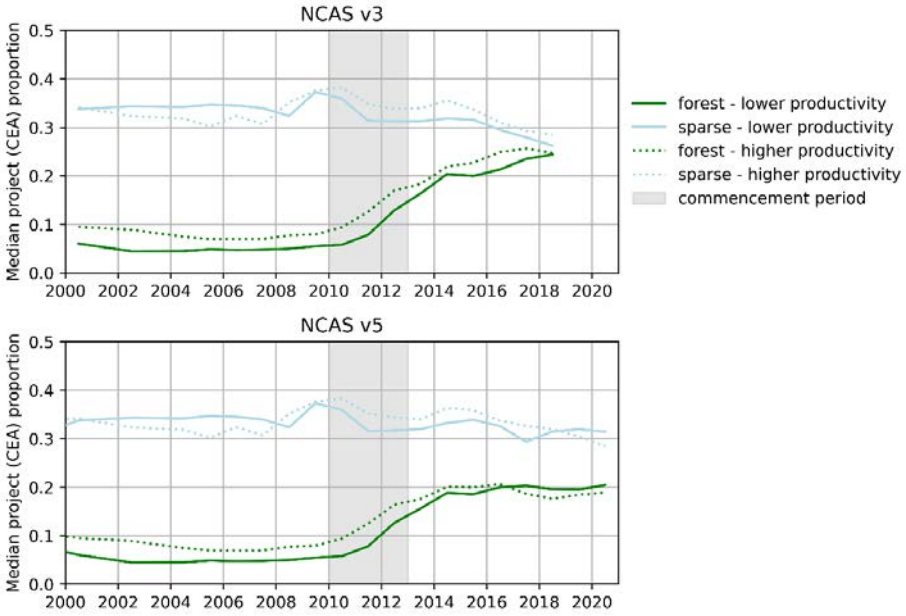


Figure 5. Trends in sparse woody and forest pixels in the CEAs of early projects, divided into lower and higher productivity groups, determined by simulated pasture growth, averaged from 2000 to 2022 (see Figure 4). Category proportions were first aggregated within CEAs of specific projects, then summarised across projects with the median value for each year.



Methods:

Study sites:

This analysis focused on the subset of HIR projects that Climate Friendly supports in NSW and QLD (n = 90). Analyses of remote sensing data focused solely on the CEAs of these projects, which are the areas within projects that are subject to abatement calculations.

Projects were repeatedly subsampled to undertake several analyses that control for factors such as project start time, climatic conditions and productivity, and suppression type. This subsampling is described further below.

Datasets:

NCAS

We use the National Forest and Sparse Woody Vegetation dataset., To assess the change in vegetation over long time periods (>20yrs). The technical approaches used in each version of NCAS are described in detail[8,9]. Although specific classes are detected with different accuracy, it is unlikely that these differences would affect this comparative analysis of early and late projects

Both NCAS versions 3 (up to 2018) and 5 (up to 2020) were analysed. These products are three-class classifications of Landsat pixels into either forest (>=20% crown cover), sparse woody vegetation (5-19%), or non-woody (0-4%) pixels. (Note: non-woody referred to in the figures as 'bare'). NCAS products are subject to post-processing after the initial allocation of cover classes. This is done in hindsight, with the most recent classifications being used to test the plausibility of previous outputs. This implies that the last 1-2 years of data shown could be subject to revision in future releases. NCAS v5 involved a change in the classification algorithm applied to the 2019 and 2020 imagery, which has implications for outputs in the preceding years due to time series post-processing[10]. It is important to note that when the category 'forest' is applied to a single Landsat pixel, this differs from the definition of forest area used elsewhere in the HIR method and in this submission, which includes a minimum area of 0.2 ha (or approx. 3.2 NCAS pixels). Unless stated otherwise, references to forest area or forest pixels in this appendix should be taken to refer to the NCAS pixel category, irrespective of the minimum area.

The proportion of CEA covered by each NCAS class was aggregated for individual projects. CEA parts, stored as polygon features, were buffered inwards by 20 m and overlapping NCAS pixels were extracted. Inward buffering ensures that only the NCAS pixels falling completely within the CEA were sampled. Given that woody vegetation thickening is more likely to occur near the boundary of existing forest (where seeds are more abundant and conditions are more favourable for recruitment, etc.), this inward buffering process provides a conservative estimate of the change in CEA forest area.

We summarised the change of each group of projects by their median project values for each year. Thus, projects were effectively treated as individual data points, and the results

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[8] Department of Industry, Science, Energy and Resources (2018). National forest and sparse woody vegetation data. Version 3. Commonwealth of Australia, Canberra.
[9] Department of Industry, Science, Energy and Resources (2021). National forest and sparse woody vegetation data. Version 5. Commonwealth of Australia, Canberra.
[10] Department of Industry, Science, Energy and Resources (2021) National Inventory Report Volume 2. Commonwealth of Australia, Canberra.

were not weighted by the size of each project's CEAs. The annual values presented should be interpreted as what were 'typical' aggregated CEA proportions for each NCAS class.

AussieGRASS

Spatial and temporal variability in productivity (and, implicitly, climatic conditions) was evaluated using the simulated pasture growth (kg/ha) provided by the AussieGRASS environmental calculator[11]. This is an estimate of growth (driven by photosynthesis) and not 'total biomass', which would require accounting for rates of consumption by grazing[12]. Temporal variability in simulated pasture growth typically follows rainfall patterns, but the absolute values are also influenced by soil attributes, estimated ground cover and tree basal area. This product gives a holistic picture of the climate variation relevant to agricultural productivity and can be used to infer when regenerating trees are likely to be targeted as feed (whereby low levels of simulated pasture growth may increase pressure on trees as fodder sources). AussieGRASS data is provided on a coarse grid (5 x 5 km pixels) and was summarised at the property scale.

Grazing pressure

Where available, project-specific data on grazing pressure in relation to an estimated 'safe grazing' level (informed by the pasture growth estimates described above) was used to indicate the likelihood of suppression by stock grazing (or lack-thereof). Further detail on the calculation of safe grazing levels can be found in discussion on Question 3, Box 1 earlier in this submission. The collation of Climate Friendly's historical project grazing and management data into a common format across all projects that can be used for portfolio level analyses is ongoing and while the sample was substantial, it was not a complete sample of projects due to this ongoing process.

Study design:

Comparing 'early' and 'late' groups of projects

The interplay between management changes and variable climate conditions makes it challenging to test the impact of project implementation at scale.

A cohort of projects whose implementation was backdated to between July 2010 and January 2013 provided a useful test case to explore the impact of management changes through multiple wet and dry periods. A total of 47 'early' projects were included. These projects had the following attributes:

- Growth stimulated by good rainfall in the 2010-2012 La Niña event(s) (in some cases as early as the 2007-2009 La Niña event(s)) (see Figure 6).
- Successive droughts (2013-2015 and 2018-2020) through which the effect of removing suppression was expected to have been visible (see Figure 6).
- Sufficient time since project start for regeneration to have been visible in medium-resolution remote sensing data.

[11] https://longpaddock.qld.gov.au/aussiegrass/
[12] State of Queensland, Department of Science, Information Technology and Innovation (2015). AussieGRASS Environmental Calculator – Product Descriptions v1.5

Another perspective was provided by a second cohort of 21 ‘later’ projects, commencing from September 2017 onwards. These projects shared the following attributes:

- Baseline periods where the woody biomass was subject to known suppression, that temporally overlapped the implementation periods of the early cohort.
- The same period of known suppression also covered a period of time where regeneration might have been otherwise expected following the 2010-2012 La Niña event(s)
- Project-facilitated regeneration is not yet expected to have been visible in NCAS data given some projects commenced as recently as 2021. These data sets would not have captured a response to the most recent high rainfall events which is the first period we would anticipate observing regeneration post removal of suppression.

Figure 6. Top: AussieGRASS simulated pasture growth summarised with a mean +/- standard deviation of values from relevant local government areas (Paroo, Bourke, Quilpie, Bulloo, Murweh). Bottom: bar chart showing the number of projects starting in each year with the shaded regions corresponding to the early and later projects used for the analyses presented here.

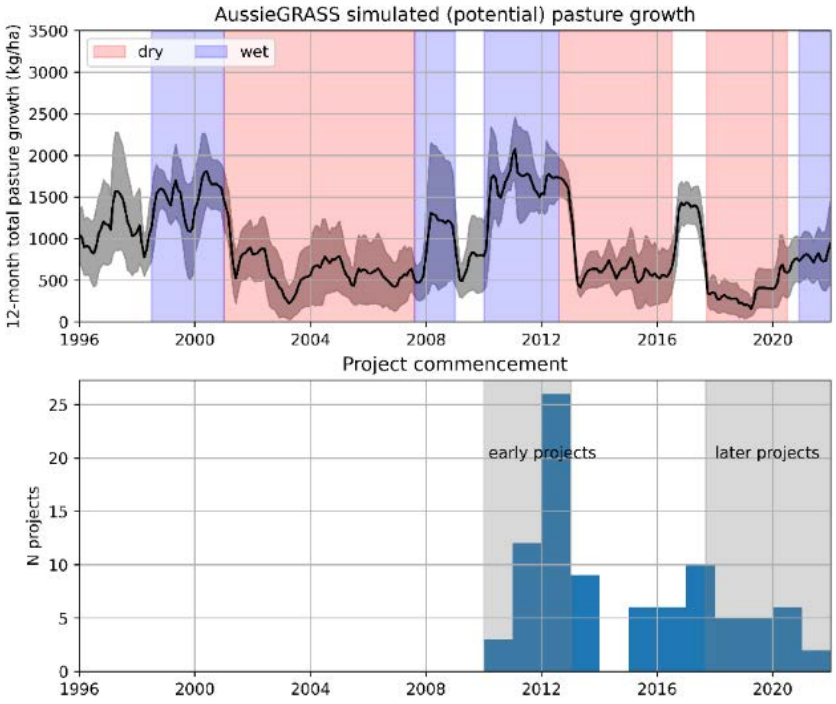
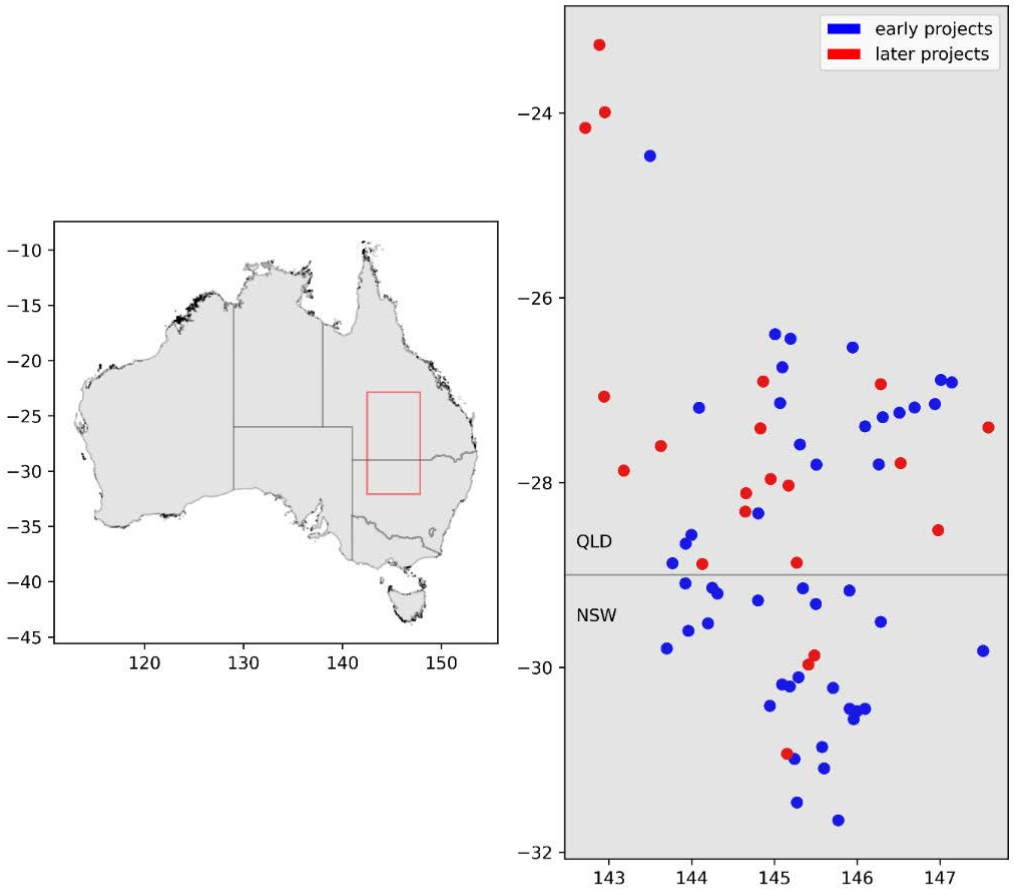


Figure 7. Distribution of projects within the early and later groups.



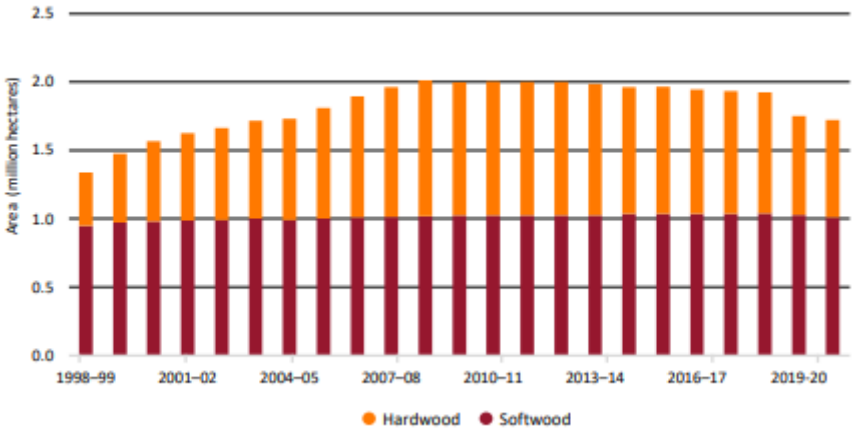
Appendix 5 – Risk of plantation forests being cleared and not replanted

The 2022 plantation forestry method has expanded the range of activities that are eligible for abatement. We understand that concerns have been raised about the 2022 Plantation Forestry Method, particularly Schedules 3 and 4 (which involve re-planting of plantations deemed at risk of conversion to non-forest; and conversion of an existing plantation to a not-for-harvest plantation, respectively).

At the time of writing, there are seven projects registered under the 2022 Plantation Forestry method. According to the ERF project register, it appears that all of these are new plantings (i.e. they are not Schedule 3 or 4 projects).[13] As such, there is insufficient data to provide a direct assessment of the integrity of this project type based on project uptake or implementation to date under Schedules 3 and 4 of the 2022 Plantation Forestry method.

However, Climate Friendly believes that the assumptions underlying Schedules 3 and 4 of the plantation forestry method are sound. That is, plantations on private land appear to be genuinely at risk of conversion to non-forest, with ABARES data[14] showing that more than 10% of Australia's plantation extent has been lost since 2010/11 (Figure 22). This has been particularly evident for hardwood plantations, with some States losing more than 50% of their plantation estate since 2010/11.

Figure 1 The total area of plantations in Australia has been steadily declining since 2010/11



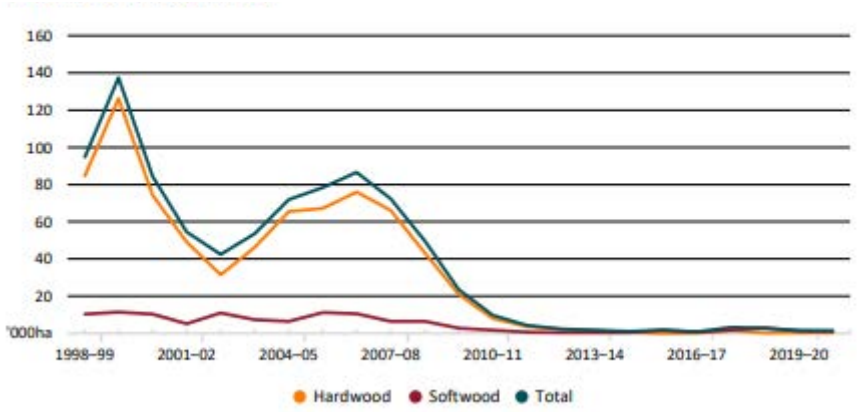
Source: ABARES Plantation Statistics Update, 2022

[13] Source: ERF Project Register. Accessed 26 September 2022. https://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/project-register The type of plantation for all seven projects registered under the 2022 plantation forestry method was described as "establishing and maintaining a new plantation forest for commercial harvesting of wood products."

[14] Source: ABARES (2022). Australian plantation statistics update. Available at: https://www.agriculture.gov.au/abares/research-topics/forests/forest-economics/plantations-update#collapsible_inner_link_plantationstatisticsinfographics

Conversely, the rate of new plantation establishment has dwindled to around 1,500 hectares in 2020/21 (Figure 23).

Figure 2 The total area of plantations in Australia has been steadily declining since 2010/11



Source: ABARES Plantation Statistics Update, 2022

This trend results in loss of carbon from Australia's plantation estate at a time when there are critical timber shortages, and when the forestry sector is ready and able to play a significant role in delivering on the nation's climate change targets. Against this backdrop, we believe that the 2022 Plantation Forestry method plays an important role in helping incentivise the establishment of new plantations, and reducing the loss of existing plantations.

30 September 2022

Attention: Professor Ian Chubb
ACCU Review Panel
By email: ACCUreview@industry.gov.au

Dear Professor Chubb,

Submission to Independent Review of Australian Carbon Credit Units (ACCUs)

Climate Friendly welcomes the Albanese Government's commitment to a high integrity carbon crediting framework, and we supported calls for this independent review. We are confident in the integrity of the carbon farming projects we support, and welcome measures to continuously improve Australia's carbon market. This will provide a sound basis for Australia to deliver on its emissions reduction targets, contributing to net-zero and negative emissions required to limit global warming to 1.5C.

This letter outlines our key recommendations for consideration by the Review Panel, and is accompanied by a detailed submission, with Part 1 addressing aspects of governance and transparency, and Part 2 providing a detailed response on the integrity and rigour of the human-induced regeneration method.

Climate Friendly believes that a carbon crediting framework is a critical component of Australia's approach to tackling the challenge of climate change. Australia's ACCU framework is world-leading, and while we have recommendations for areas in which it can be strengthened and continuously improved, we believe the current framework has high integrity and that it is vital to re-establish investor and community confidence in carbon farming as an outcome of this review.

Key Recommendation 1: the Review Panel confirm that there is no evidence of fraud, and that ACCUs issued from Human-induced Regeneration projects are based on credible science, have rigorous technical safeguards, and passed independent audits.

The term "fraud" has a well-defined legal and regulatory meaning, and carries a range of serious penalties under various legislative instruments which govern Australia's world-leading carbon crediting framework. Potential consequences of fraud include, but are not limited to, the following:

1. Relinquishment of ACCUs;
2. Unilateral revocation of a carbon farming project by the Regulator;
3. Imposition of carbon maintenance obligations on the land;
4. A range of civil and criminal penalties administered by ASIC relating to financial products and directors' duties.

Recent commentary on scheme asserted that "*70 to 80 per cent of the ACCUs issued to these projects are devoid of integrity... What is occurring is a fraud on the environment, a fraud on taxpayers and a fraud on unwitting private buyers of ACCUs* " (ANU Media Release, 24 March 2022, quotations by Professor MacIntosh). Further, the co-authors state in a related papers their "*decision to use the word 'fraud' was deliberate and considered.*" (ANU Paper, Fixing the Integrity Problems with Australia's Carbon Market, June 2022). By implication, it is our view that these statements suggest that organisations like Climate Friendly and our partners who are involved in delivering projects are involved in activities that are either fraudulent or result in fraudulent outcomes. However, in subsequent statements the lead author Professor MacIntosh stated "*we also recognise we don't have all the data*" (Radio National interview, 24 March 2022, 8.05am at 7.22). In addition to not having access to all the data, we note that the series of ANU Papers on

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the human-induced regeneration method authored by the co-authors are a) not peer reviewed, and b) do not provide any evidence of fraud.

The deliberate decision to use the term “fraud” in the absence of access to adequate data is highly concerning, and undermines achievements made by carbon farmers to tackle climate change.

Climate Friendly is a purpose-driven organisation, and our people have dedicated their professional careers, and much of their personal time, to tackling climate change. Our leadership team has collectively spent decades working on high-integrity land-based carbon farming, including working in the public service, research organisations, independent audit organisations, and in Climate Friendly. We provide detailed responses to the commentary on the human-induced regeneration method and analysis of the portfolio of projects Climate Friendly supports in Part 2 of this submission.

We include here a snapshot of that analysis showing increases in forest cover in the project implementation areas following implementation of management practice changes in early projects. These early projects implemented practice changes in the period of 2010-2013, following announcements from the Australian Government of their intention to create land-based carbon farming methods and to include provisions to recognise early action. These early management actions are evidenced by management data included in the submission. This management change information has been subject to third party independent audits as part of project implementation. The early projects are located in the same regions and rainfall bands as later projects that commenced carbon farming between 2017 and 2021. As shown in the graph below, early projects had a long history of no increase in forest cover, consistent with long run suppression. Once they changed management practices, previously supressed areas increased forest cover and declined in bare land. On the contrary, similar areas of land in later projects with long histories of suppression remain stagnant over an extended period leading up to project commencement. This includes relatively stagnant, and for periods declining, forest cover during three La Nina rainfall cycles since 1996. See Part 2 of our submission for in-depth analysis.

Note that NCAS “forest pixels” do not equate to "forest area", but are isolated forest pixels that can contain some larger pre-existing paddock trees. Pixels are classified as forest against a threshold of at least 20% crown canopy cover in the pixel. There must be at least three contiguous pixels for an area to constitute a “forest area” in line with internationally approved definitions of forest in Australia. All forest areas are removed from carbon estimation areas. We also note that Climate Friendly currently utilises Sentinel-2 satellite data which are higher resolution (10x10m pixels) for our human-induced regeneration project mapping, but these datasets are only available back to 2015. For the purposes of time series analysis, we have utilised two different versions of NCAS datasets (25x25m pixels) which are the only long run change datasets available. Further, the above analysis shows that carbon estimation areas contain less than 10% forest pixels at project start. We are not credited for these pre-existing paddock trees. All existing carbon stocks are removed from crediting and the presence of scattered trees is accounted for in the FullCAM model calibration. See Part 2 of submission and technical annexes for further details.

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While in our view the use of the term fraud is inappropriate and disappointing, there is one aspect on which we do agree wholeheartedly with the Professor MacIntosh and his co-authors, and that relates to the establishment of better national data sharing systems to improve transparency. This has the potential to deliver a multitude of benefits, including enabling better informed analysis of the impact of carbon farming.

Key recommendation 2: the Government establish a National Integrated Land Database to enable sharing of carbon, environmental and agricultural production data in a way that protects privacy while enhancing transparency of information, expanding research capability and informing best practice land management and policy development.

Climate Friendly and our carbon farming partners collect an enormous amount of environmental, carbon, agricultural production and other land management data. This data is collected as part of our rigorous feasibility assessments covering a 10-year baseline period, with ongoing data collection throughout the 25-year project implementation period. We use this data to apply scientific approaches to measure, monitor and estimate the amount of additional carbon stored by land managers. We have adopted the latest technology for verification and monitoring, including aerial lidar and high-resolution satellite imagery, and track quarterly reporting by land managers on implementation of their changed management practices. We also conduct regular visits to the project so that experts can monitor and validate project impact. All of this evidence is regularly reviewed by independent accredited auditors and the Clean Energy Regulator.

There is a significant opportunity to share this data to support ongoing research, continuous improvements of national carbon, environmental and agricultural policies, programs and systems, and to provide information to other land managers to aid decisions on managing their property.

In the case of carbon farming projects, this data is tightly linked to privacy laws and the livelihoods of individual land managers. Therefore, there are careful legal, ethical and technological considerations in enabling access to this information. For the last two years Climate Friendly has been working on possible solutions to enhance data sharing and transparency with industry, government and research partners, and supports the establishment of a national data sharing platform which makes information accessible, while also protecting privacy. A short explainer video on our proposal to establish a National Integrated Land Database is available here: https://www.climatefriendly.com/future-of-carbon-farming/.

Key recommendation 3: the Review Panel proposes structural governance reforms to address any perceptions of conflict of interest and enhance public trust in the governing bodies through greater separation of policy review, policy development, market operations and project compliance functions

In our view, Government officials involved in administering the carbon farming framework have shown dedication to implement the intents and purposes of the legislation, and many market participants have shown a similar dedication to best practice by developing voluntary self-regulation, such as through the Code. However, there remain some opportunities to further strengthen governance and address some structural risks to deliver best practice governance and promote continued scale up of the carbon crediting framework. In particular, transparency and accountability of ministerial decision making on method prioritisation could be strengthened, and the ERAC method development structure could be reformed to include a dedicated land sector sub-committee with adequate staffing and expertise. The Government could also enhance regulation of service providers, either through formalising the voluntary Carbon Market Institute (CMI) Code of Conduct, or by introducing accreditation requirements for agents administered by Government. Refer to Part 1 of our submission for more details on our proposals.

Key recommendation 4: the Review Panel recommended an integrated approach to co-benefit standards, including by amending the *Carbon Farming Initiative Act* to incorporate the planned Biodiversity Stewardship Certificate Framework and enabling the Regulator to declare one project that applies multiple carbon farming methods or biodiversity protocols on a single property to streamline administration.

Best practice land-based carbon farming has a significant potential to deliver multiple environmental, Indigenous, agricultural productivity and other benefits. There are many controls already embedded within the ERF scheme and its methods to minimise the risk of adverse impacts. Recognising that many carbon farming participants may also wish to participate in other certification standards or markets for ecosystem services, Climate Friendly believes it is important, to harmonise the regulatory frameworks to streamline administration, avoid risks of double claiming in different schemes, reduce the cost of compliance, and optimise the ability of land managers to deliver multiple, long-term benefits.

Key recommendation 5: the Review Panel recommend the Integrated Farm Management method be finalisation as a priority way to both scale up benefits for Indigenous Australians and scale up land-based carbon sequestration using the latest science and technology.

High integrity land-based carbon farming is critical to achieving net-zero and negative emissions required to limit global warming to 1.5C. We believe this is best delivered through an integrated land carbon farming method, which enables land managers and Indigenous Australians to implement best practice sustainable land management in all regions of Australia. The Integrated Farm Management method can deliver this and apply the latest science and technology. It is currently being developed through a co-design process, and its development should be confirmed as a priority as an outcome of this review.

We are deeply committed to continuous improvements in our own practices, as well as across broader Australian and global carbon markets to ensure they effectively reduce emissions. Science is not static – advances in technology mean this is a rapidly evolving sector that should be under periodic review and continual improvement. We will continue to advance the science and methods that underpin effective land sector carbon abatement projects, and provide a pathway for regional Australia, land managers and Traditional Owners to participate in a net zero, socially inclusive transition.

Thank you for the opportunity to contribute to the review process, and please do not hesitate to contact us if you require further information.

Kind regards

Josh Harris

Co-CEO & Director

Skye Glenday

Co-CEO & Director

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Summary of Detailed Recommendations:

Service provision & participation in ERF:

1. *Government should provide realistic, unbiased guidance to land managers outlining the true complexity of operating carbon projects, and the full package of expertise required. This contrasts with current communications materials published that commonly suggest navigating the scheme is simple and imply land managers could self-service. This would help build trust in the skilled advice provided by the carbon service industry, and enable land managers to conduct an honest appraisal of the trade-offs of self-managing a carbon project, as compared with appointing one or multiple service providers to assist them with project management and administration.*
2. *Government should enhance regulation of service providers, either through formalising the voluntary Carbon Market Institute (CMI) Code of Conduct, or by introducing accreditation requirements for agents administered by Government.*

Governance:

3. *Structural revisions be implemented to scheme governance to improve the perception of potentially conflicted roles in a) policy review, b) policy & method development, c) project compliance and d) market operation.*
4. *Restructuring of the ERAC to create additional technical subcommittees with adequate staffing and expertise.*
5. *New technical subcommittees continue to be supported by a form of co-design, such as that currently adopted for method development by the Clean Energy Regulator, involving a broad cross-section of organisations and interests that results in greater integrity and more implementation-ready methods that are informed by diverse perspectives and experience.*
6. *Provide clear guidance on the relative importance and potential trade-offs between high integrity, volume of abatement and costs of compliance or scheme complexity. Clearer guidance from the government on the costs of compliance and expertise required would help prospective participants make more informed choices on self-management vs service partnerships when commencing a project.*
7. *Increase the transparency of how the offsets integrity standards are applied by the ERAC or as part of Ministerial decisions related to method prioritisation and approval.*
8. *Establish a clear and transparent decision-making process around prioritisation of any new methods for development or variation.*
9. *Continuation of a method co-design model similar to that currently adopted by the Clean Energy Regulator. This will ensure high integrity, implementation-ready methods that are informed by both the latest science and real world operational issues.*
10. *Establishment of two separate advisory bodies, one focused on the land sector and one on energy and waste sectors.*

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Transparency:

11. *Create a public registry of individual precedents or rulings on carbon farming projects, similar to the system of public rulings provided by the ATO.*
12. *Establish a National Integrated Land Database to enable sharing of carbon, environmental and agricultural production data in a way that protects privacy while enhancing transparency of information, expanding research capability and informing best practice land management and policy development.*
13. *Consider the interaction of data transparency recommendations made in the Samuels Review of the nation's environment laws.*

Procedural improvements:

14. *Introduce the option of process-based audits to lower transaction costs, utilise emerging technologies to unlock viability of carbon farming for smaller scale land managers.*
15. *Auditor guidelines and training should be updated to ensure auditors have the appropriate skills and expertise to conduct process-based audits. This could draw on guidelines and requirements from other sectors where process-based audits are common.*

Co-benefits:

16. *Amend the Carbon Farming Initiative Act to incorporate the Biodiversity Stewardship Certificate Framework into a joint carbon and biodiversity framework, rather than creating two separate but mirroring pieces of legislation.*
17. *Enable to Regulator to declare one project that applies multiple carbon farming methods or biodiversity protocols, so that land managers can opt to participate in relevant carbon farming methods and biodiversity protocols on a single property through one harmonised project.*
18. *Consider other opportunities to integrate emerging standards, policies and programs to optimise multiple benefits, streamline land manager participation and help to reduce regulatory complexity and costs of participation in parallel schemes.*
19. *The eligible interest holder consent process for Native Title Holders be reviewed to determine if the process is fit for purpose for this category of interest holder, or whether changes could be made to improve this process for Native Title Holders and further encourage land managers to establish projects in partnerships in regions with determinations. Opportunities to strengthen may include provision of further support mechanisms (financial and advisory) for Native Title Holder groups. Additionally, it should be considered whether there is any benefit to regulatory notification deadlines similar to those that apply in other sectors such as mining. This review should be done through a consultative process involving Native Title Holder groups and other Indigenous Australian input, as well as land managers and service providers.*
20. *Climate Friendly has reviewed the ICIN Report (Sept 2022, Mapping the Opportunities for Indigenous Carbon in Australia: Identifying opportunities and barriers to Indigenous participation in the Emissions Reduction Fund), and broadly supports its recommendations, including specifically their recommendation to develop an Integrated Farm Management Method that is suited to all environments across Australia, including the Desert and the Savanna, and has appropriate Indigenous participation in the design and development.*

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21. *Consider the recommendations from Climate Friendly's submission on the Biodiversity Certification Scheme for how biodiversity can be optimised.*
22. *Repeal the veto power and requirement for additional project approvals by the agricultural minister for regeneration projects which cover more than 30% of a property (Section 13(4) and 20C of the Carbon Credits (Carbon Farming Initiative) Rule 2015, should be repealed)*
23. *Recognise the positive benefits of carbon farming on agricultural production and drought resilience of farms and regional communities in Australia.*

Relationship to voluntary Climate Active certification:

24. *If the Government's 43% emission reduction target for 2030 takes into account voluntary corporations carbon neutrality commitments, then 100% of Climate Active's offsets should be sourced from ACCUs (rather than the current requirement of 20%). This helps ensure the national ambition is not undermined. However, we note this may also discourage voluntary action which will be important to exceed the 43% target and place Australia on a trajectory to meet the 1.5C Paris commitment.*
25. *If the Government's 43% target does not include Climate Active carbon neutral commitments, then there is less imperative to mandate the use of over 20% ACCUs in any Climate Active certification. However, any other eligible units able to be used under the Climate Active standard should be carefully screened to ensure they meet a similar integrity benchmark to ACCUs.*
26. *Refer to our separate submission to Climate Active on the proposed land standard and harmonise review recommendations.*
27. *Provide a clear policy position on how and when other international voluntary standards can be applied in Australia, to ensure there is no double counting of abatement.*

Technical Rigour

28. *Note the evidence of grazing, feral animal, clearing and other suppression of vegetation in the rangelands region where human-induced regeneration projects commonly occur*
29. *Note the evidence of land management practice changes and the consequent regeneration of the project implementation areas that has occurred in human-induced regeneration projects. Confirm that there is no evidence of fraudulent conduct, and that ACCUs issued from human-induced regeneration projects are based on credible science, have rigorous technical safeguards, and passed independent audits.*
30. *Note the substantial risk of plantation forests being cleared and not replanted, releasing carbon.*

Future

31. *Note the potential of the Integrated Farm Management method to scale up land-based carbon sequestration using the latest science and technology, informed by lessons from implementation of land-based carbon projects to date, and support finalisation of this method as a priority.*

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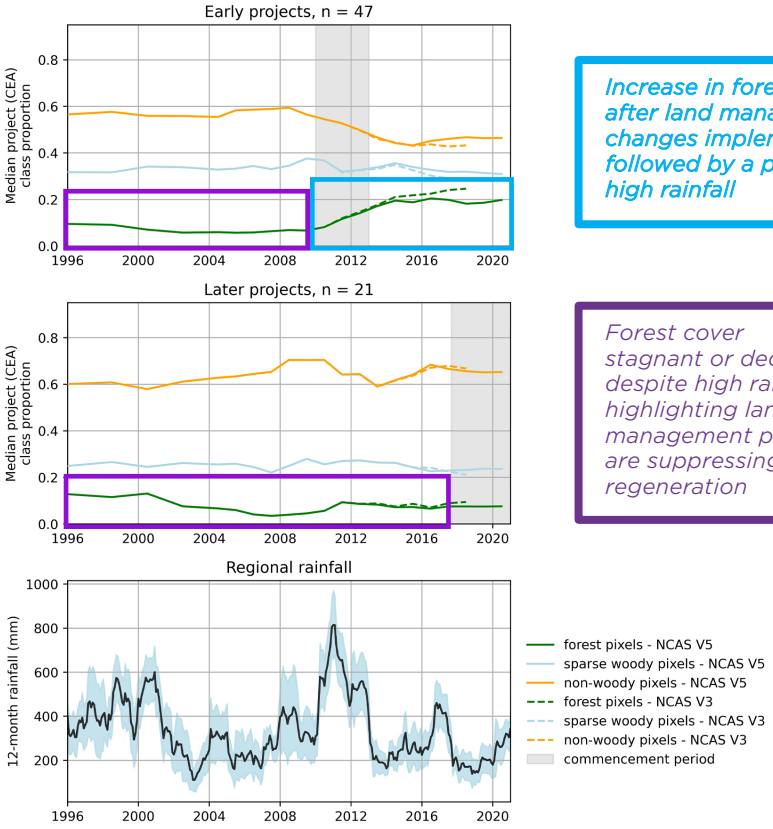
Our impact: carbon farming regenerating the landscape

Climate Friendly's experience of more than a decade working on Australian carbon farming has generated a large volume of data. Our latest analysis of this data shows that ***regeneration needs the right combination of sustainable land management practices and rainfall.***

Adoption of sustainable land management practices is regenerating Australia's woodland forests

Recent analysis of our human-induced regeneration (HIR) carbon farming projects in the eastern Australian rangelands confirms that prior to those projects commencing there is no increase in forest cover for many decades, including through high rainfall in multiple La Nina periods.

For older carbon farming projects, there has been a strong increase in forest cover since projects commenced and clearing and grazing practices changed. This contrasts with more recent projects, where forest regeneration continued to be suppressed until they commenced carbon farming. Similar regeneration is now occurring on these sites with the recent rainfall, and forest cover should start to increase in 2022 with release of satellite data when available.



Increase in forest cover after land management changes implemented followed by a period of high rainfall

Forest cover stagnant or declining despite high rainfall, highlighting land management practices are suppressing regeneration

Without practice changes, over-grazing and land clearing continues to lead to degradation of Australia's woodland forests

Acacia woodland forests in Australia's rangelands have long been degraded. It is mostly caused by clearing trees and over-grazing compared to available pasture. Carbon farming in the rangelands presents an opportunity to address both this environmental decline and the climate crisis.

Examples of types of forest degradation common in the Australian rangelands.

1. Hedging

Hedging is formed by close and repeated grazing on the young vegetation, commonly mulga. This results in the trees being clipped into a consistent height, or hedge, from cattle or goats. The hallmarks are a very even height of the young shrub-formed mulga.

2. Snapped stems

Tall stems are often snapped where goats or cattle have reached up on their hind legs and brought down the stem to access the feed at the top. Or smaller trees are commonly trampled for easier access to the palatable vegetation.

3. Bonsai

"Bonsai and thickened stems" are caused by continual grazing of individual trees, typically by sheep and goats, keeping them in a 'bonsai' form with highly thickened stems.

4. Clearing

"Pushing trees and fodder harvesting" of palatable vegetation is common to provide feed for livestock in drought periods, or clearing can also be conducted to increase pasture area.

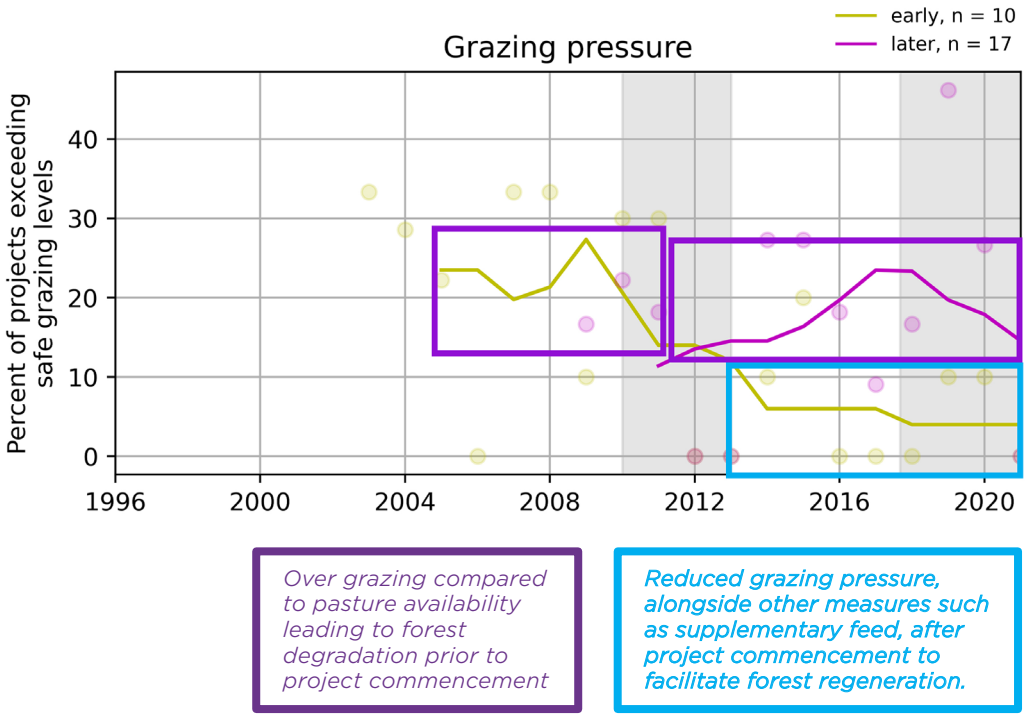
89% of the projects Climate Friendly supports involve changing more than one land management practice, with 70% involving cessation of clearing practices.

Land managers undertaking human-induced regeneration carbon farming projects have changed their grazing practices to regenerate the landscape

Our analysis shows that the increase in forest cover in our early carbon farming projects aligns with the decline of grazing pressure that occurred when carbon project activities began.

It also shows that the later registered carbon projects continued to over graze in the period from 2012 until project commencement.

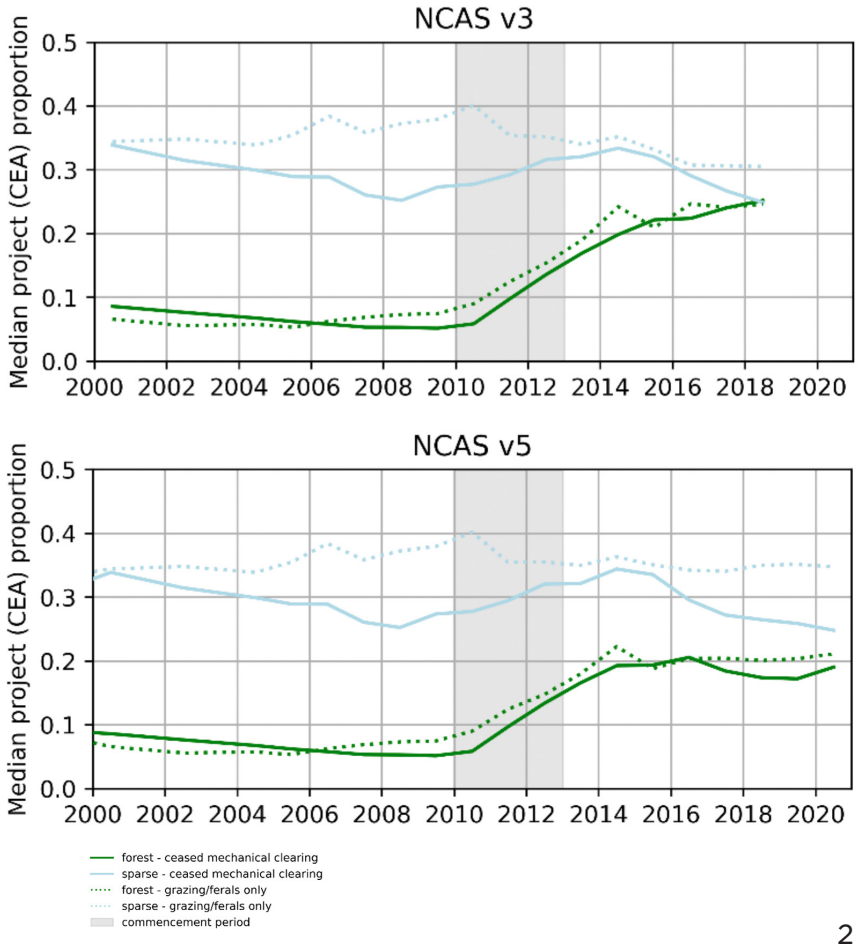
Our analysis highlights land managers are actively implementing practice changes that can facilitate regeneration in periods of high rainfall. Without carbon projects, unsustainable grazing practices are commonplace and continue to degrade our woodland forests.



Changing grazing management and ceasing clearing are both effective ways to store carbon

Our analysis compared forest growth in eastern Australian human-induced regeneration carbon farming projects that included ceasing land clearing, to projects that only changed management of grazing and/or feral animals.

The results illustrate that the impact of reducing grazing pressure and managing feral animals is comparable to forest restoration in projects that involve ceasing land clearing. This shows that changes to grazing management and ceasing clearing are both effective ways to regenerate the land and store carbon.

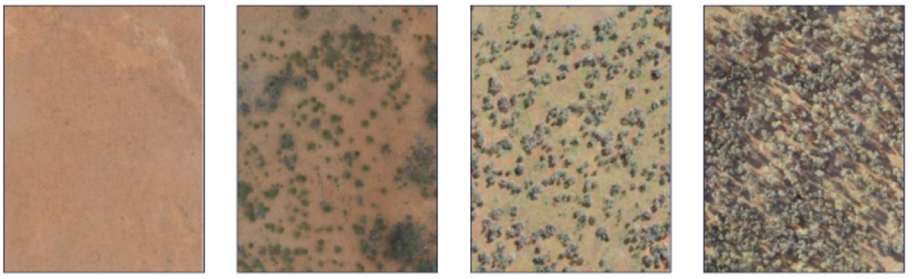


Pre-existing trees are not receiving carbon credits

The Human-Induced Regeneration method only credits abatement stored in regenerating trees. This involves multi-step mapping and field validation processes. First, each "pixel" of a satellite image is classified into one of three categories:

1) regenerating; 2) forest; 3) bare. This is based on the presence or absence of "pre-existing trees" in the satellite image.

Example of what the different categories look like from satellite



Bare Land
0% Canopy Cover

Sparse Woody
>5% – <20% Canopy Cover

Forest
~20% Canopy Cover

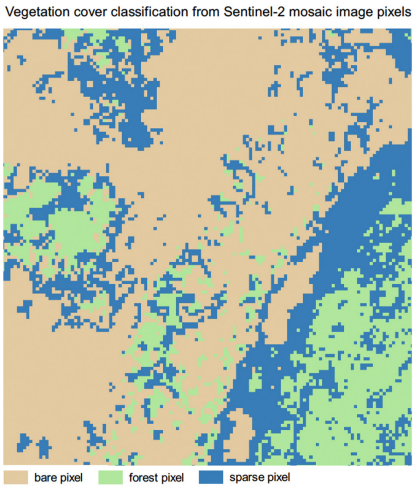
Forest
~70% – 100% Canopy Cover

Individual pixels must be "grouped" into areas of 0.2Ha or greater. This is because one 'pixel' does not constitute a 'forest area'.

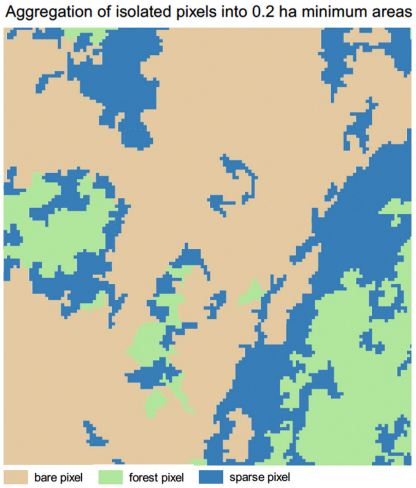
Carbon credits can only be generated from 'regenerating areas' and all 'forest areas' are excluded.

Once grouped, regenerating areas will have some scattered pre-existing trees, or scattered "forest pixels". Pre-existing trees are essential to provide the source of seeds that can enable further regeneration to occur to restore the land to forest. However, these trees are not credited any abatement.

Example of individual pixel classification into the three categories

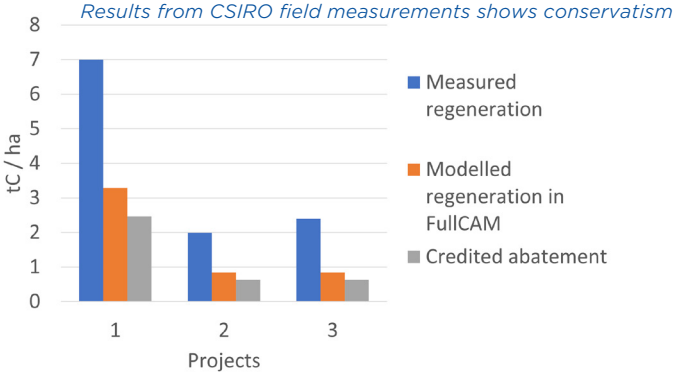


Example of the area classification once grouped into 0.2 Ha areas

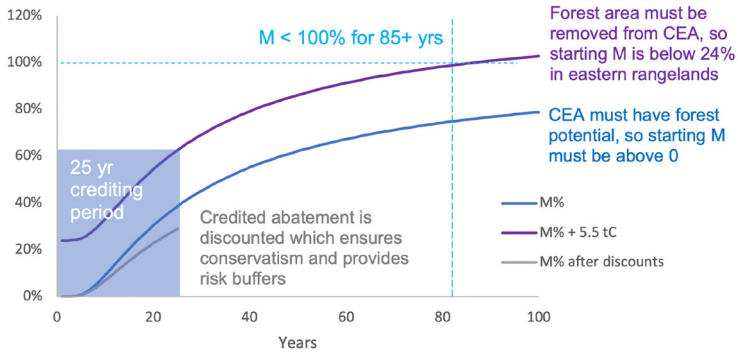


Our projects are conservatively credited, as verified by recent CSIRO field measurements

Results from CSIRO field measurements shows conservatism



Risks of over-crediting abatement do not emerge for 85+ years



More carbon is stored in the regenerating trees on our carbon projects that is being credited. This was confirmed by recent CSIRO field measurements of carbon stored in regenerating trees across 81 measurement sites on three carbon projects in eastern Australia. These measurements excluded carbon stored in any mature or "pre-existing" trees.

The conservativism in carbon credit claims is due to conservative elements built in to the FullCAM model calibrations, the exclusion of forest area from CEA, the length of projects (25years) and our modelling approach which is informed by extensive land management data. Risks of over-crediting do not occur until well after the project crediting period ends, giving confidence that all credited abatement is real.

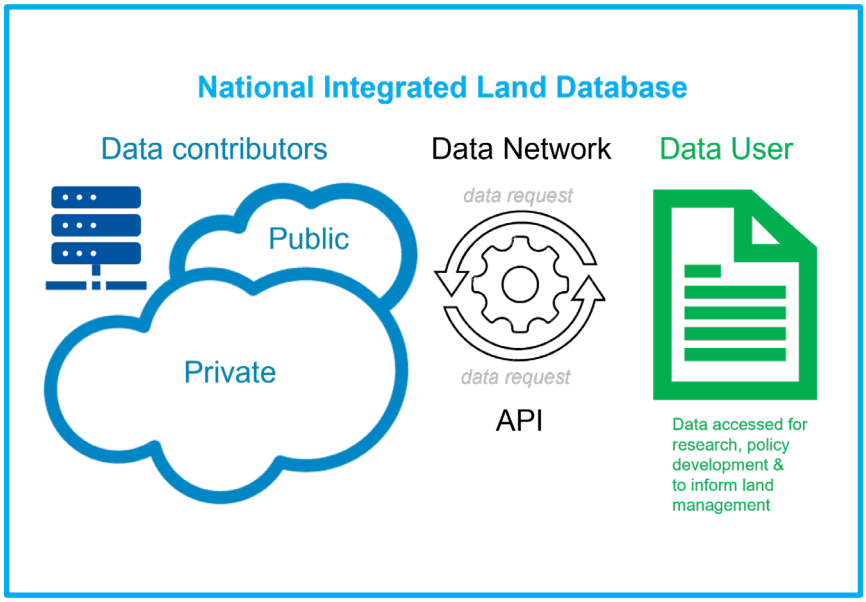
This provide confidence that Australian Carbon Credit Units issued to our projects represent verified abatement, and in many cases our projects are being under-credited against their impact on the ground.

Climate Friendly believes many recent carbon credit integrity concerns can be solved through increased data transparency. This requires legislative change and new data infrastructure.

Establishing a National Integrated Land Database

Climate Friendly recommends that the Government establishes a National Integrated Land Database to enable sharing of carbon, environmental and agricultural production data in a way that protects privacy while enhancing transparency of information. This will enable others to complete similar analysis to ours above and help inform best practice land management and policy development.

Climate Friendly and our carbon farming partners collect an enormous amount of environmental, carbon, agricultural production and other land management data. We use this data to apply scientific approaches to measure, monitor and estimate the amount of additional carbon stored by land managers following practice changes. We have adopted the latest technology for verification and monitoring, including aerial lidar and high-resolution satellite imagery, and track quarterly reporting by land managers on agricultural production and property management. All this evidence is regularly reviewed by independent accredited auditors and the Clean Energy.



There is a significant opportunity to share this data to support ongoing research, continuous improvements of national carbon, environmental and agricultural policies, programs and systems, and to provide information to other land managers to aid decisions on managing their property.

In the case of carbon farming projects, this data is tightly linked to privacy laws and the livelihoods of individual land managers. Therefore, there are careful legal, ethical and technological considerations in enabling access to this information. A short explainer video on our proposal to establish a National Integrated Land Database is available here:

https://www.climatefriendly.com/future-of-carbon-farming/.

The data in this leaflet was provided in our submission to the Chubb Review - and we invite other organisations in the sector to provide their own detailed data set.

There are naturally privacy constraints to releasing elements of our project data, and we have sought to de-identify our carbon farming partners in our submission to the review – this does not detract from our call for others in the industry to release their accumulated data (subject to privacy considerations), which would considerably strengthen collective integrity and governance.

About Climate Friendly

Founded in 2003 by a CSIRO scientist, Climate Friendly is a profit-for-purpose company with a vision for a productive, sustainable land sector that contributes to a zero net emission Australia by 2050. We achieved our first target to support 20 million tonnes of greenhouse gas reductions at the end of 2020, and our purpose is to scale up to 100 million tonnes by 2025. We are one of the longest operating and most experienced carbon extension service providers in Australia. Our growing team of 65+ expert staff has supported registration of over 150 carbon projects since 2014. We partner with agricultural producers, foresters, Traditional Owners, conservation organisations and governments to design and implement these projects across approximately 10 million hectares of land.