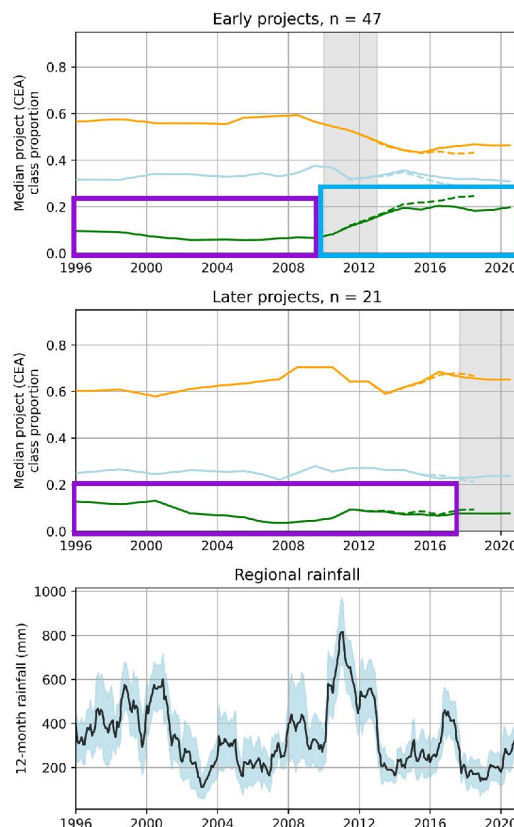


Climate Friendly's experience of more than a decade working on Australian carbon farming has generated a large volume of data. Our latest analysis of this data shows that **regeneration needs the right combination of sustainable land management practices and rainfall**.

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 have reached up on their hind legs to access higher branches, or cattle have brought down the stem to access the feed at the top. 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.

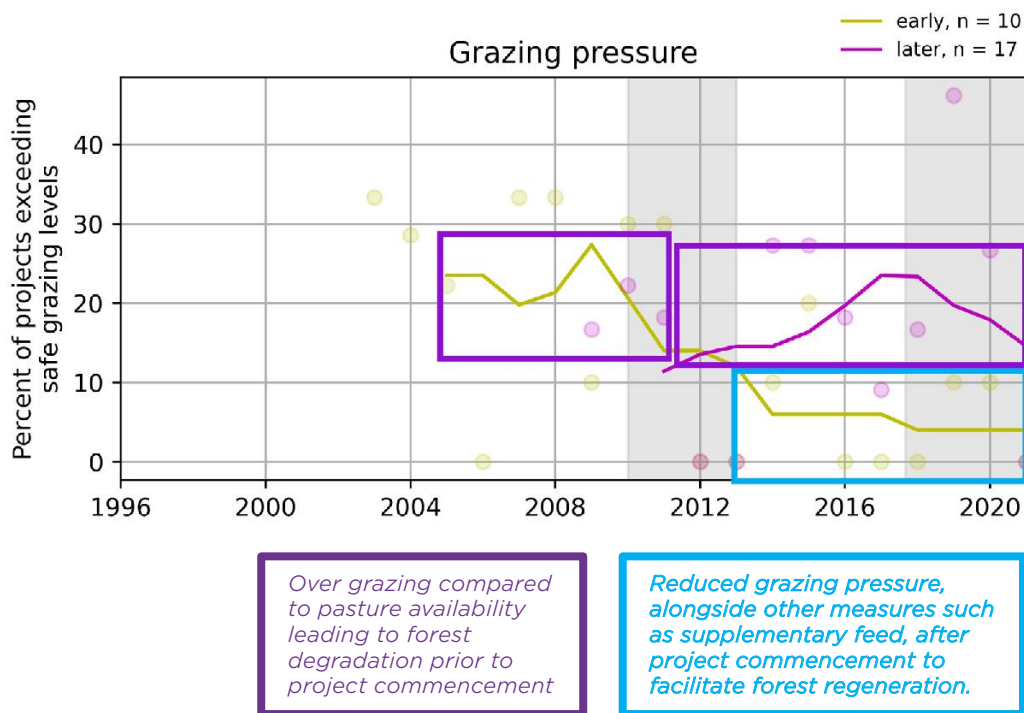
89% of the projects Climate Friendly supports involve changing more than one land management practice, with 70% involving cessation of clearing practices.

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.

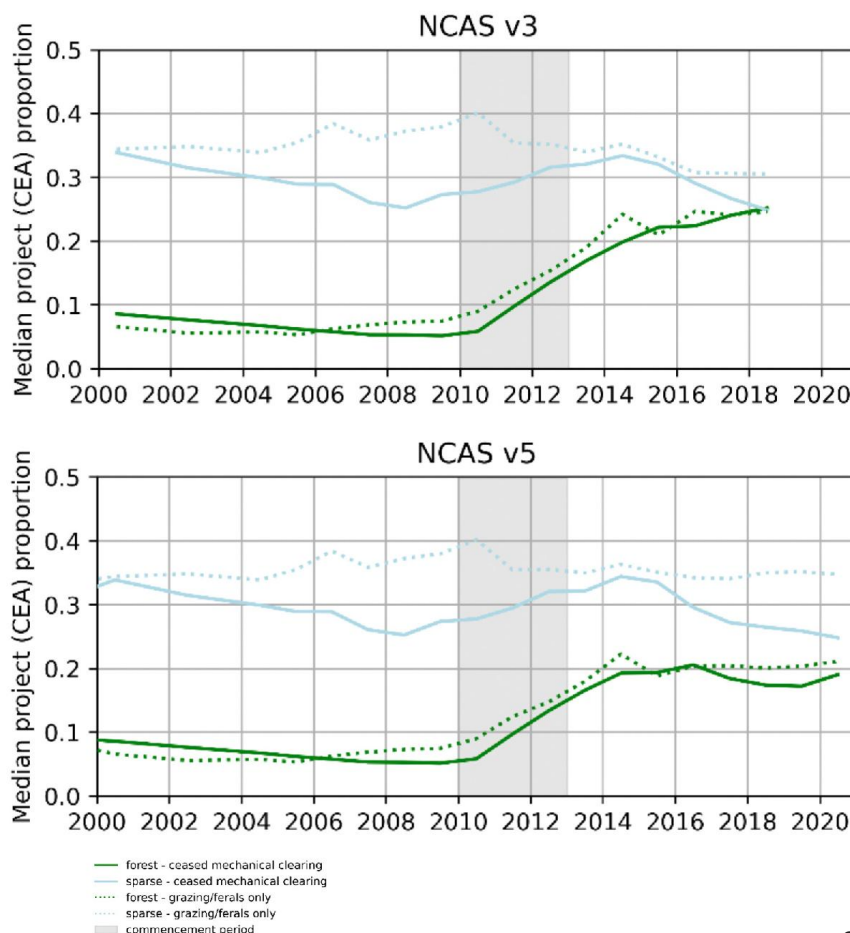
Our analysis highlights land managers are actively implementing practice changes that can facilitate regeneration in periods of high rainfall. Without carbon projects, unsustainable grazing practices are commonplace and continue to degrade our woodland forests.



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.

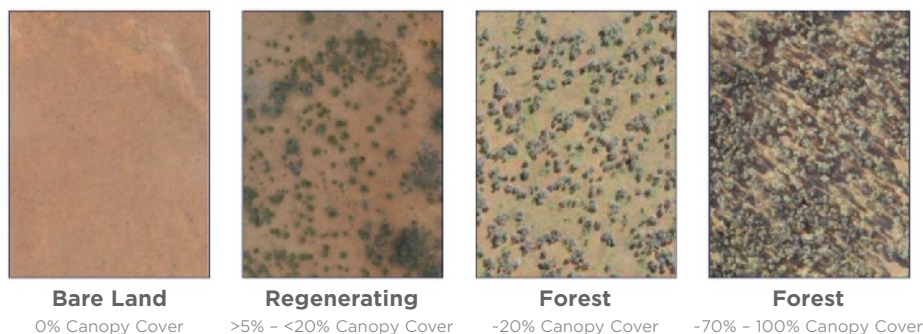


Pre-existing trees are not receiving carbon credits

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



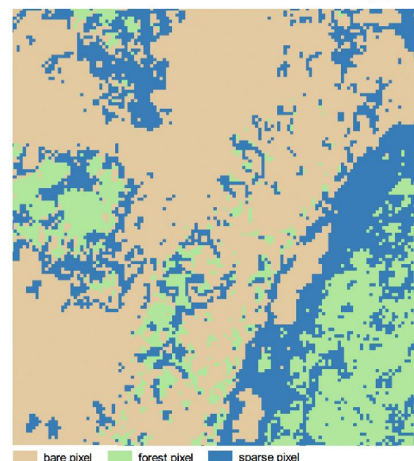
Individual pixels must be “grouped” into areas of 0.2Ha or greater. This is because one ‘pixel’ does not constitute a ‘forest area’.

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.

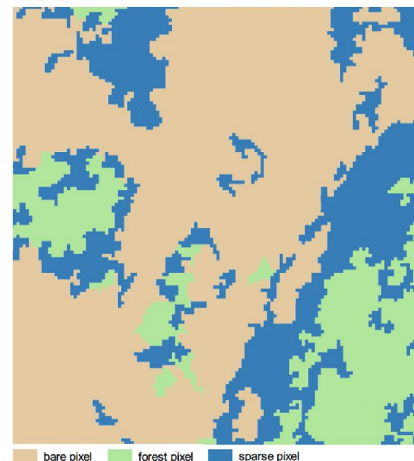
Example of individual pixel classification into the three categories

Vegetation cover classification from Sentinel-2 mosaic image pixels



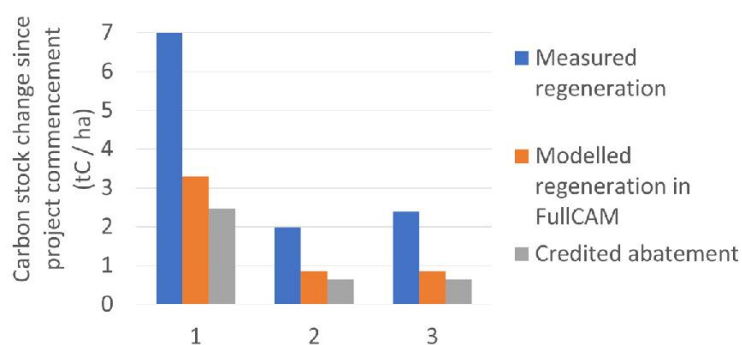
Example of the area classification once grouped into 0.2 Ha areas

Aggregation of isolated pixels into 0.2 ha minimum areas

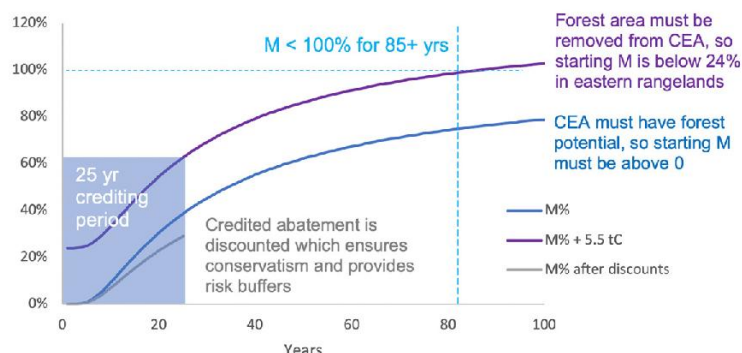


Our projects are conservatively credited, as verified by recent CSIRO field measurements

Results from CSIRO field measurements shows conservatism



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



The amount of carbon accumulated in the regenerating trees on our carbon projects is more than is being credited. This was confirmed by recent CSIRO field measurements of carbon accumulated since project commencement 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.

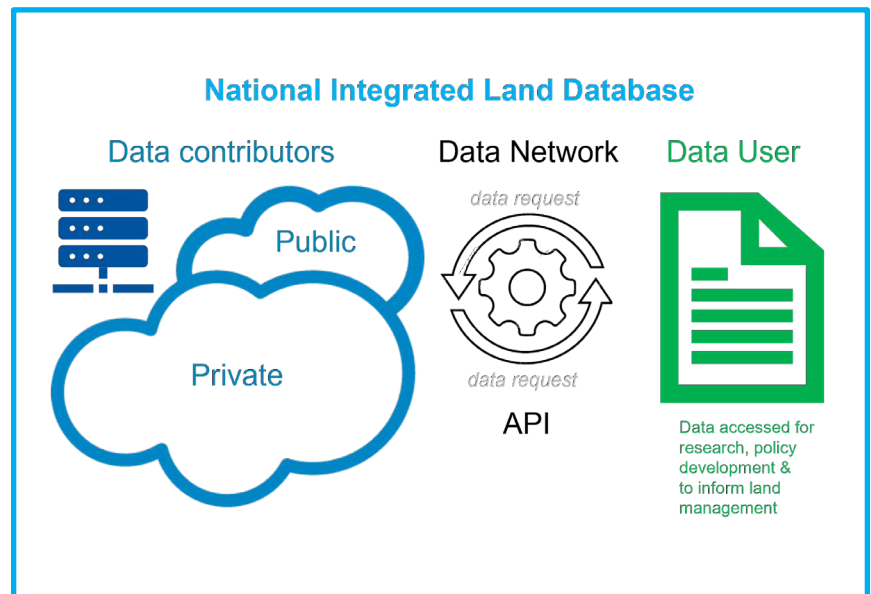
The conservatism in carbon credit claims is due to conservative elements built in to the FullCAM model calibrations, the exclusion of forest area from CEA, the length of projects (25 years) relative to the longer growth trajectory of forests, and our modelling approach which is informed by extensive 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.

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 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. 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.