

Correcting the Record: Response to Professor Chubb's Statement on Carbon Farming

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Introduction

On 17 March 2023, the Department of Climate Change, Energy, Environment and Water's (DCCEEW) published a paper by Professor Ian Chubb, the former Chair of the Independent Review of Australian Carbon Credit Units (ACCUs), titled, *Carbon Farming: let's get real and let's get on with it*.¹ The paper focuses on the ACCU scheme and the recommendations the Review made to improve it. The essence of the argument put forward in the paper is that the ACCU scheme is robust and that the Review's recommendations, and the scheme's compliance and enforcement processes, will address any issues that exist with the integrity of projects and credits. Consistent with this, Professor Chubb argues '[w]e have to work at it, get real and get on with it'.²

Professor Chubb's paper contains a number of statements and omissions that are pertinent to the debate about human-induced regeneration (HIR) projects that require clarification. We discuss these below.

Reliance on Beare and Chambers report

In the paper, Professor Chubb relies on the 'Beare and Chambers report' that was commissioned by the Clean Energy Regulator to defend the integrity of HIR projects.³ As Professor Chubb notes, the Beare and Chambers report concluded:

Overall, the analysis presented here provides strong evidence that projects established under the HIR method have resulted in significant increases in WF (woody forest) cover in the arid and semi-arid regions of NSW and Queensland.⁴

Professor Chubb dismisses the critique of the Beare and Chambers report prepared by the ANU-UNSW ERF research team, stating:

The Panel also considered the response to Beare and Chambers (2021) prepared by Macintosh et al (2022). Unfortunately, Macintosh et al (2022) had restricted access to data because of the secrecy provisions in the CER Act (Part 3), which limited the value of their critique.⁵

¹ Available at: <https://www.dcceew.gov.au/climate-change/emissions-reduction/independent-review-accus> (22 March 2023).

² Chubb, I (2023) *Carbon Farming: let's get real and let's get on with it*. DCCEEW, p 1.

³ Beare, S., Chambers, R. (2021) *Human induced regeneration: A spatiotemporal study*. AnalytEcon Pty Ltd, Berry, NSW.

⁴ Beare, S., Chambers, R. (2021) *Human induced regeneration: A spatiotemporal study*. AnalytEcon Pty Ltd, Berry, NSW, p 3.

⁵ Chubb, I (2023) *Carbon Farming: let's get real and let's get on with it*. DCCEEW, p 3.

The suggestion that the ANU-UNSW ERF research team's critique is of limited value because it was not based on carbon estimation area (CEA) data (i.e. data drawn from the areas that are credited under HIR projects) is misleading. The ANU-UNSW ERF research team's critique of the Beare and Chambers report centred on three issues.⁶

1. **Beare and Chambers found the analysed projects had only a small impact on tree cover.** Beare and Chambers found that, overall, the 123 projects they analysed in New South Wales and Queensland had a statistically significant but small impact on tree cover (sparse woody plus forest cover) in the CEAs relative to their 'quasi-control' areas. When represented on a per hectare basis in satellite-derived woody cover data, where each hectare is divided into 16 25m x 25m pixels, the attributed difference equated to a mere 1.3 pixels in NSW and 0.6 pixels in QLD (or a relative difference of 8% of CEA area in NSW and 4% of CEA area in QLD). While the identified impact was small, it is even smaller when compared to how the projects are credited. The projects are credited as if they are regenerating forest cover across the entire CEA area (16 out of 16 pixels) in an even-aged manner. This should not be in dispute – it is the unavoidable conclusion that comes directly from Beare and Chambers' analysis.
2. **Gross underperformance of a substantial number of projects.** Beare and Chambers found 23% of all analysed projects, and 37% of the analysed QLD projects, had no, negative or almost no impact on sparse woody and forest cover relative to what would have otherwise occurred.
3. **Flaws in the method used by Beare and Chambers.** The method Beare and Chambers used was flawed and is likely to have overstated the attributed impacts of the projects on tree cover. Most notably:
 - (a) the report assessed the impact of the project activities on the basis of trends in woody cover in control areas where sparse woody and forest cover may have been declining – whereas the method credits on the assumption of absolute increases in forest cover from a baseline of zero biomass; and
 - (b) the report assessed the impact of the project activities using control areas that included parts of the project properties that had been excluded from the CEAs, resulting in the analysis comparing trends in:
 - (i) sparse woody and forest cover in CEAs that were specifically selected by proponents on the basis they contained regenerating woody vegetation that had the potential to achieve forest cover; to
 - (ii) sparse woody and forest cover in exclusion areas that were specifically selected by proponents on the basis they did not contain regenerating woody vegetation that had the potential to achieve forest cover, or already contained forest cover.

⁶ Macintosh, A., Butler, D., Evans, M. C., Larraondo, P., Ansell, D., Gibbons, P. (2022) The ERF's Human-induced Regeneration (HIR): What the Beare and Chambers Report Really Found and a Critique of its Method. The Australian National University, Canberra.

This is a basic error in experimental design – in scientific jargon, the areas selected for comparison were not unbiased controls for the treatment areas and therefore were not valid.

Contrary to Professor Chubb's suggestion, the fact the ANU-UNSW ERF research team does not have access to the CEA data is not relevant to the above issues.

An additional issue that subsequently came to light with the Beare and Chambers report was that the 'significant increase' in woody forest cover that Beare and Chambers found was most likely largely due to the fact they used backdated project commencement dates. In the original version of the HIR method, proponents were allowed to backdate their project commencement dates if they met certain requirements. While not clear from the report, it appears that a substantial proportion of the projects analysed by Beare and Chambers are likely to have backdated their project commencement dates until in or around 2010-2012.⁷ This is despite the fact the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act) did not commence until 2011, the HIR method was not made until 2013, and the first HIR projects were not registered until late 2014 (most of the analysed projects were registered in 2015 and 2016). To the extent the backdated project commencement dates were used, it is likely to have resulted in Beare and Chambers attributing changes in cover over the period 2010-2015/2016 to the HIR project activities, even though the projects were not registered and the project activities are unlikely to have started.⁸

Australian Academy of Science (AAS) report

In discussing the HIR method, Professor Chubb refers to the Australian Academy of Science (AAS) report titled, *Review of Four Methods of Generating Australian Carbon Credit Units*,⁹ stating:

The Panel commissioned the Australian Academy of Science (AAS) to provide advice on the science underpinning four methods. The AAS was provided with more than 30 peer reviewed and published articles as well as other expert opinions. The report was reviewed

⁷ Emissions Reduction Assurance Committee (ERAC) (2022) Emissions Reduction Assurance Committee findings on the Emissions Reduction Fund's Human Induced Regeneration method. Available at: <http://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/ERAC-findings-on-the-Human-Induced-Regeneration-method.aspx> (22 March 2023).

⁸ It is difficult to believe many (if any) projects meet the formal legal requirements for backdating until 2010-2012. This is because they require proponents to establish that they stopping clearing, or took steps to reduce grazing from livestock and feral animals, in order 'to induce the establishment of a native forest from in situ seed, lignotubers or root stock (coppice) sources'. It is not credible that landholders would stop clearing, destock or increase feral animal control in order to induce the regeneration of native forests years before the method was created. This is made more obvious by the fact that, at the time, landholders in the rangelands where HIR projects are located were fighting for the freedom to clear native trees and shrubs in areas of native vegetation that had experienced woody thickening. We are meant to believe that, while fighting to be able to clear thickened native woody vegetation, there were large numbers of landholders who were simultaneously changing land management practices in order to induce woody thickening, in anticipation of a carbon method that did not exist and would not exist for several years. Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest—1.1) Methodology Determination 2013 (F2015C00576), ss 1.3 and 2.3 (definition of 'human-assisted regeneration activity').

⁹ Australian Academy of Science (2022) Review of Four Methods of Generating Australian Carbon Credit Units. Report for the Department of Climate Change, Energy, the Environment and Water, Canberra.

by three independent academics before it was provided to the Panel (Report). It was important input and carefully considered along with the rest.

Notably, Professor Chubb does not mention that the AAS report found that the HIR method does not contain appropriate processes for separating out the impacts of the project activities from the impacts of rainfall when estimating abatement. On this issue, the AAS report states:

Variable patterns in rainfall are the dominant drivers of fluctuations in woody biomass in these systems, with the proportion attributable to human activity small and variable. This triggers the ‘evidence based’ offset integrity standard, as it is not clear how changes in carbon sequestration in HIR projects can be convincingly differentiated between human and climatic changes.¹⁰

Later, in a section on how the method could be improved, the AAS report states:

Separating the impact of management actions from natural variability or climate change remains challenging. It may be possible to address this issue of attribution by restricting new HIR projects to areas with higher rainfall and showing clearer signals of human activity.¹¹

Regulation of HIR projects is robust

In discussing the HIR method, Professor Chubb states:

The Panel concluded that the HIR method is sound – particularly as it is administered by a robust regulatory framework.¹²

He then states:

We saw no evidence that the CER does not act when circumstances require.¹³

The evidence relied on to support these statements appears to be limited to ‘advice from the Clean Energy Regulator’, previous reviews of the methods and scheme, and the public submissions to the review, particularly those from people participating in the scheme.¹⁴

Notably, the panel did not review any projects to assess compliance. The Panel openly states in its report that it ‘did not review individual projects’.¹⁵

To reach a conclusion on whether the requirements of the HIR method are being complied with requires individual projects to be assessed. Because the Review did not do this, its conclusions

¹⁰ Australian Academy of Science (2022) Review of Four Methods of Generating Australian Carbon Credit Units. Report for the Department of Climate Change, Energy, the Environment and Water, Canberra, p 11.

¹¹ Australian Academy of Science (2022) Review of Four Methods of Generating Australian Carbon Credit Units. Report for the Department of Climate Change, Energy, the Environment and Water, Canberra, p 12.

¹² Chubb, I (2023) Carbon Farming: let’s get real and let’s get on with it. DCCEEW, p 3.

¹³ Chubb, I (2023) Carbon Farming: let’s get real and let’s get on with it. DCCEEW, p 4.

¹⁴ Chubb, I (2023) ‘Carbon credit scheme review dismisses claims it lacks integrity’. Radio National (RN) Breakfast. Australian Broadcasting Corporation. 10 January 2023. Available at: <https://www.abc.net.au/radionational/programs/breakfast/carbon-credit-scheme-review-dismisses-claims-it-lacks-integrity/101839390> (22 March 2023).

¹⁵ Chubb, I. et al. (2022) Independent Review of ACCUs. Department of Climate Change, Energy, the Environment and Water, Canberra, p 21.

regarding how the Regulator administers the method are speculative, at best. There is substantial evidence in the public domain that suggests the Clean Energy Regulator has failed to properly administer the HIR method in accordance with the law.

FullCAM efficacy to accurately measuring carbon abatement in projects with substantial remnant vegetation

Professor Chubb's paper has a section titled 'FullCAM efficacy to accurately measuring carbon abatement in projects with substantial remnant vegetation'.¹⁶ This is a reference to the ANU-UNSW ERF team's position that it is not scientifically valid to apply the model that is used to estimate sequestration in HIR projects (FullCAM) to areas that contain significant numbers of mature trees and shrubs at project commencement (i.e. because it will overestimate tree growth and lead to over-crediting).

Professor Chubb states that:

In November 2022, CSIRO published a verification study of the FullCAM calibrations in HIR regions with high project activity. The evidence showed that the model is sufficiently calibrated for areas in human-induced regeneration projects that include vegetation with a range of ages during the 25-year crediting period.¹⁷

The 2022 CSIRO report sought to determine whether the current version of FullCAM (there are three in use in HIR projects) reasonably predicted sequestration in young regeneration.¹⁸ To do this, the CSIRO scientists took tree measurements on 33 sites across 14 HIR projects in NSW and QLD. They found the current version of FullCAM performed reasonably (model efficiency of 42%) and with negligible bias.

There are a number of notable aspects of the CSIRO study that are relevant to the current debate.

- The sites that were included in the study were provided by carbon service providers with HIR projects and seemingly handpicked by them, and all contained strong regeneration. They are not a random or systematic sample of HIR CEAs.
- The study was not confined to HIR CEAs. Some CEAs were included but other survey areas were outside of CEAs. The report does not disclose the number that were inside and outside CEAs.
- To the extent that the survey sites were within CEAs, the scientists did not apply FullCAM in accordance with how the proponents have applied it under the HIR method.
- Only the current version of FullCAM was used, not the version of FullCAM that is used by the proponents. Most of the relevant HIR projects are likely to use an older version of the model.

¹⁶ Chubb, I (2023) Carbon Farming: let's get real and let's get on with it. DCCEEW, p 4.

¹⁷ Chubb, I (2023) Carbon Farming: let's get real and let's get on with it. DCCEEW, p 4.

¹⁸ Paul, K., Roxburgh, S. (2022) Verification of FullCAM's Tree Yield Formula for Regenerating Systems. CSIRO, Australia.

- 20 of the 33 sites (60%) that were surveyed were previously cleared, only 13 were previously uncleared. The 13 uncleared sites are the only ones that are relevant to the debate about the application of FullCAM to areas that contain remnant vegetation.
- The 13 relevant survey sites cover a total of 9.9 hectares. The CEAs of the projects in NSW and Qld alone cover approximately 3.4 million hectares.¹⁹
- On 5 of the 13 sites, the modelled estimates were more than 40% higher than the measured estimates (i.e. significantly overestimating sequestration).
- On 7 of the 13 sites, the measured mass of the trees (above-ground biomass) was more than 50% of the modelled estimated maximum for the site (for 3 it was more than 100% of the maximum). This suggests that, if the modelled sequestration was close to the measured sequestration, it was often due to errors in the maximum biomass estimate used in the model, i.e. more luck than logic.

Moreover, the same CSIRO scientists that prepared the 2022 report have previously agreed, in writing, that it is not appropriate to use the current calibration of FullCAM to estimate tree growth in sites containing significant ‘baseline biomass’ (i.e. where the mass of pre-existing mature trees and shrubs exceeds 5% of the maximum carrying capacity for the site that is used in the model).²⁰ This view is corroborated in a report prepared Dr Cristopher Brack for the AAS. In his report, Dr Brack states:

Age, especially relative to the age of maximum annual increment, is a major term in the FullCAM models and an error in age would introduce a systematic distortion in the annual stock change (bias). Similarly, classifying land as being completely cleared for agriculture will introduce a bias in FullCAM when there are in fact remnant trees or shrubs. The carbon stocks in these remnants should not be included in the human-induced regeneration, but these remnants could also significantly slow down any competing human-induced regeneration.²¹

Professor Chubb refers to Dr Brack’s report in his paper but he failed to include the above statements, which are the most relevant to the issue in debate.

¹⁹ Clean Energy Regulator (2022) ‘Aggregated carbon estimation area data’. Commonwealth of Australia, Canberra. Available at: [https://www.cleanenergyregulator.gov.au/ERF/Pages/Choosing%20a%20project%20type/Opportunities%20for%20the%20land%20sector/Vegetation%20and%20sequestration%20methods/Human-Induced-Regeneration-\(HIR\)-aggregated-project-data.aspx](https://www.cleanenergyregulator.gov.au/ERF/Pages/Choosing%20a%20project%20type/Opportunities%20for%20the%20land%20sector/Vegetation%20and%20sequestration%20methods/Human-Induced-Regeneration-(HIR)-aggregated-project-data.aspx) (22 March 2023).

²⁰ Butler, D. et al. (2022) Australian National University (ANU)-University of New South Wales (UNSW) ERF research team submission to the Chubb Review, at 31-49. Available at: <https://consult.dccew.gov.au/independent-review-of-accu/submission/list> (22 March 2023); Paul, K., Roxburgh, S. (2021) Baseline AGB: TYF calibration for natural regeneration in land managed for grazing. CSIRO, Canberra.

²¹ Brack, C. (2022) Comments on the “science” of measuring carbon credits for Human-induced regeneration of a permanent even-aged native forest and Avoided deforestation, p 1.

Professor Chubb also does not make any reference to the fact that GreenCollar, the largest developer of vegetation projects in the ACCU scheme, made a joint submission to the Review with the ANU/UNSW ERF research team that states:

GreenCollar shares the ANU/UNSW ERF research team's concerns about measurement and agrees that FullCAM is not currently calibrated for use on sites where native vegetation exceeds 5% of the estimated maximum biomass at the modelling commencement date. ... Both GreenCollar and the ANU/UNSW ERF research team believe that land areas with demonstrably more than 5% of their maximum biomass carrying capacity (assessed at an appropriate scale) at the time of modelling commencement date, should be removed from the CEAs of HIR projects.²²

In short, the 2022 CSIRO report does not support the conclusion that the way FullCAM is being applied in HIR projects is scientifically valid. Most of the sites used in the study are not representative of the areas in which most HIR projects are located and the study did not evaluate the validity of how the model is being applied in practice under HIR projects.

What should be beyond debate is that, if FullCAM is applied to sites that are largely extant native vegetation, where there are significant numbers of pre-existing mature trees and shrubs, it will significantly overestimate sequestration in any regeneration that is occurring, particularly after the regeneration reaches approximately 10-13 years of age (i.e. the assumed age of maximum growth). Unfortunately, most HIR projects are using FullCAM in areas of extant native vegetation that contain significant numbers of pre-existing mature trees and shrubs.

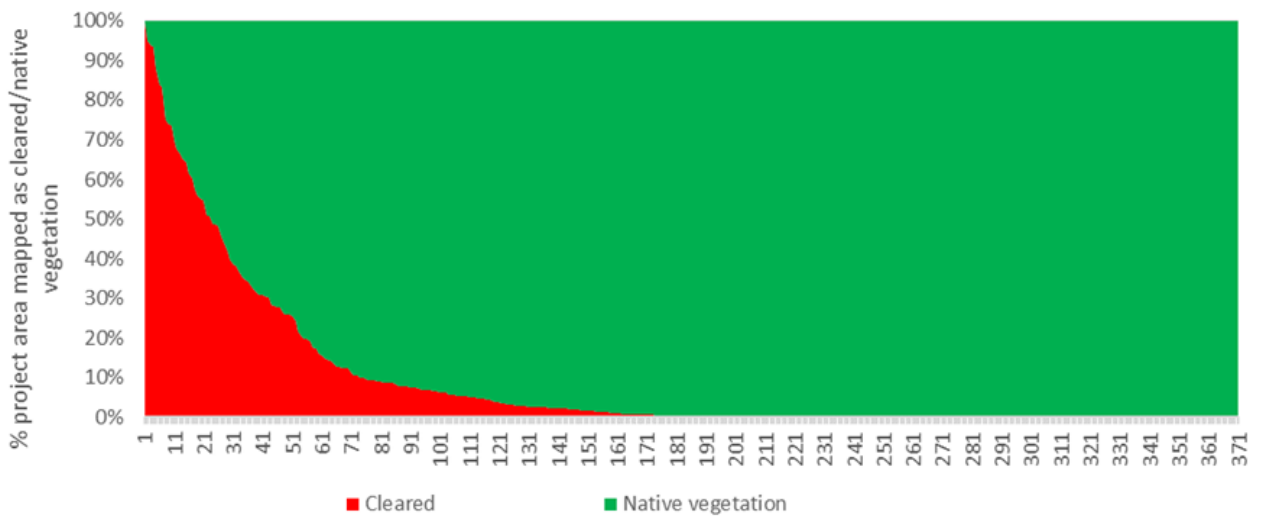
To illustrate this, Figure 1 below shows the proportion of the project areas for all 371 projects that are mapped as cleared and extant native vegetation in Australian Government datasets. The Figure shows that:

- 99% or more of the project areas of 213 projects (57% of all HIR projects) are mapped as extant native vegetation (i.e. less than 1% mapped as cleared); and
- 95% or more of the project areas of 261 projects (70% of all HIR projects) are mapped as extant native vegetation (i.e. less than 5% mapped as cleared).

While the relevant datasets are known to be imperfect in places, the scale of the problem means that the issue cannot be dismissed as mapping error. The data suggest the misapplication of FullCAM in HIR projects is a major integrity problem.

²² GreenCollar and ANU-UNSW ERF Research Team (2022) Joint Submission to the Independent Review of Australian Carbon Credit Units, p 5. Available at: <https://consult.dcceew.gov.au/independent-review-of-accu/submission/list> (22 March 2023).

Figure 1. Proportion of HIR project areas mapped as cleared and extant native vegetation, March 2023



Source: DCCEEW (2022) National Forest and Sparse Woody Vegetation Data; National Vegetation Information System (NVIS).

Conclusion

Professor Chubb’s paper downplays the existence of any material integrity issues with the ACCU scheme and calls for people to ‘get on with it’. His position relies heavily on the fact that, on paper, the Clean Energy Regulator has extensive powers to address issues if and when they arise.

In our view, this overlooks the seriousness of the existing integrity issues and the consequences of leaving them unresolved. It also overlooks the fact that the Clean Energy Regulator is responsible for many of the problems that have arisen, particularly with HIR projects.

The Clean Energy Regulator has misapplied the HIR method, which has resulted in the inclusion of vast areas of land that do not meet the method’s eligibility requirements. The Regulator has then repeatedly denied the existence of any problems. It is important to note that the Clean Energy Regulator is a statutory body, which is not subject to directions from the Minister on the interpretation and administration of methods, meaning the extent to which it implements the Review’s recommendations concerning HIR projects is largely within its own discretion.²³

Given what has occurred, we do not believe the Clean Energy Regulator can be trusted to fix the problems with the ACCU scheme. We are also concerned that further delay in resolving the issues will leave the scheme, and many landholders and investors, exposed to escalating risks.

²³ Clean Energy Regulator Act 2011 (Cth), s 41.