Phantom Forests and the Safeguard Mechanism: How Low-integrity Offsets are Obstructing Climate Action

Andrew Macintosh,[1] Don Butler,[1] Pablo Larraondo,[2] Debra Wilkinson,[3] Megan C. Evans,[4] Piero Morseletto,[5] Sophus O.S.E. zu Ermgassen[6] and David J. Eldridge[7]

18 November 2026

Affiliations: [1] The Australian National University, Centre for Environmental Markets; [2] Haizea Analytics Pty Ltd; [3] Centre for Environment & Integrity Pty Ltd; [4] University of New South Wales, Canberra; [5] Erasmus University, Rotterdam School of Management; [6] University of Oxford, Nature-positive Hub, Department of Biology; [7] University of New South Wales, Sydney.

Report for the Australian Conservation Foundation.

Appendices A, B and C

Australian National University

© The Australian National University

Corresponding authors:

Professor Andrew Macintosh
Co-director
ANU Centre for Environmental Markets
ANU College of Law, Governance and Policy
The Australian National University
Email: andrew.macintosh@anu.edu.au

Professor Don Butler
Co-director
ANU Centre for Environmental Markets
ANU College of Law, Governance and Policy
The Australian National University
Email: donald.butler@anu.edu.au

Recommended citation:

Macintosh, A., Butler, D., Larraondo, P., Wilkinson, D., Evans, M.C, Morseletto, P., zu Ermgassen, S., Eldridge, D. (2026) Phantom Forests and the Safeguard Mechanism: How Low-integrity Offsets are Obstructing Climate Action. Report for the Australian Conservation Foundation. The Australian National University, Canberra.

Acknowledgements:

The authors thank the Australian Conservation Foundation for its financial support, Haizea Analytics Pty Ltd for its extensive in-kind contributions to the project and Australian Spatial Analytics Ltd for conducting the independent assessment of the very high-resolution imagery.

Datasets:

The very high-resolution satellite imagery used to analyse HIR projects can be viewed at: https://carbonimagery.au/.

The VMAP Forest Extent and Woody Cover datasets are available via: https://vmap.au/.

© The Australian National University

Table of Contents

Appendix A. History of the administration of the HIR method 4

Appendix B. Evolving defences of HIR projects 22

Appendix C. Method used to analyse forest regeneration in HIR projects 28

C1. Project sample 28

C2. Assessment of forest regeneration 29

Appendix A. History of the administration of the HIR method

To fully understand the administration of the HIR method, it is necessary to start with the development of the science on the impacts of grazing in the rangelands in the early to mid-20th century. Rangelands make up approximately 81 per cent of Australia's landmass. These low rainfall semi-arid and arid areas experience high rainfall variability and periodic extreme droughts. The low and highly variable rainfall makes the rangelands ill-suited to intensive land uses such as cropping. Consequently, the dominant land use across the rangelands is extensive livestock grazing of native vegetation.

From 1895 to 1903, the Australian continent experienced one of the worst droughts in recorded Australian history. Along with massive stock losses, "the Federation Drought" resulted in a widespread tree death that left vegetation across significant parts of western Queensland and New South Wales more open and sparse than it had previously been.[1] The relative absence of woody vegetation remained until the middle of the twentieth century,[2] when a series of sustained wet periods, corresponding with La Niña events, triggered an increase in the density of woody vegetation in some rangeland areas.[3] This phenomenon, which became known in Australia as "woody thickening",[4] was of concern to pastoralists because the increased density of woody vegetation adversely impacted pasture growth and productivity.[5]

---

[1] Fensham, R., Powell, O., Horne, J. (2011) Rail survey plans to remote sensing: vegetation change in the Mulga Lands of eastern Australia and its implications for land-use. Rangeland Journal 33, 229-238.

[2] The relative absence of tree regeneration over this period sparked concern about the loss of fodder trees like mulga (Acacia aneura) through clearing and the effects of grazing. See Ratcliffe, F. (1930) Flying Fox and Drifting Sand. Chatto and Windus, London, UK; Drover (1936) The Future of Edible Scrub. Sydney Mail, 9 September; Brown, W.G. (1938) Preserve the Edible Shrubs: Need for Mulga Regeneration Points Moral. Queensland Country Life, 27 October; Brown, W.G. (1940) Preserving our Mulga Belt. Queensland Country Life, 21 November; Condon, R.W. (1949) Encouragement of Natural Regeneration. The Western Herald, 10 June. See also later studies on grazing impacts on mulga; e.g. Brown, R. (1985) The growth and survival of young mulga (Acacia aneura F. Muell) trees under different levels of grazing. Australian Rangelands Journal 7(2), 143-148; Cunningham, G., Walker, P. (1973) Growth and survival of mulga (*Acacia anuera* F.Muell ex Benth) in western New South Wales. Tropical Grasslands 7(1) 69-77.

[3] The two key wet periods for these purposes were 1954-57 and 1973-76, both of which corresponded with sustained La Niña events (the 1973-76 event is the longest on record). These two events brought above average rainfall across outback Queensland and New South Wales for most of these years. Rainfall from April 1954 to January 1957 was in the highest decile across outback Queensland and New South Wales, with significant areas experiencing the wettest period on record. Similarly, rainfall from June 1973 until March 1976 was above average across most of the continent, but particularly wet conditions were experienced in the rangelands of Queensland and New South Wales (i.e. highest on record or highest decile). There were also significant wets in the mid-1960s, late 1980s and from 1998 to 2001, before the onset of the Millennium Drought. See: Condon, R.W. (1979) Pastoral management, economics land use options in poplar box (*Eucalyptus populnea*) lands of New South Wales. Australian Rangelands Journal 1, 260-266; Bureau of Meteorology (2026) Australian rainfall during El Niño and La Niña events. Commonwealth of Australia, Canberra. Available at: https://www.bom.gov.au/climate/history/enso/ (3 August 2026); Fensham, R.J., Fairfax, R.J., Archer, S.R. (2005) Rainfall, land use and woody vegetation cover change in semi-arid Australian savanna. Journal of Ecology 93, 596–606.

[4] Woody thickening is also referred to as woody encroachment, woody plant encroachment, woody plant proliferation, woody weed invasion and invasive native scrub. It has been documented phenomena occurs the world's rangelands, including in the Americas and southern Africa. Archer, S. (2001) Tree-grass dynamics in a Prosopis-thomscrub savanna parkland: Reconstructing the past and predicting the future. Ecoscience 2(1), 83-99; Archer, S.R. et al. (2017) Woody Plant Encroachment: Causes and Consequences. In Briske, D. (ed) Rangeland Systems: Processes, Management and Challenges. Springer, USA, Chapter 2; Venter, Z. et al (2018) Drivers of woody plant encroachment over Africa. Nature Communications 9, 2272; Eldridge, D. et al. (2011) Impacts of shrub encroachment on ecosystem structure and functioning: Towards a global synthesis. Ecology Letters 14, 709–722; Biancari, L. et al. (2024) Drivers of woody dominance across global drylands. Science Advances 10, eadn6007.

[5] Condon, R. (1979) Pastoral Management, Economics and Land Use Options in the Poplar Box (Eucalyptus populnea) Lands of New South Wales. Australian Rangeland Journal 1(4), 260–266; Booth, C.A., Barker, P.J. (1980) Inedible Shrub Regeneration in the North West Corner of New South Wales. Western District Technical Bulletin

Researchers from the CSIRO, Soil Conservation Service of New South Wales, Queensland Department of Primary Industries (Charleville Pastoral Laboratory) and elsewhere began documenting woody thickening through this period and noted its potential to adversely affect pastoral productivity (Figure A1).[6] This observation prompted research on the causes of the observed thickening, including establishment of permanent grazing exclosures (fenced areas where some or all grazing animals are excluded).[7] Numerous studies were also undertaken on how grazing and fire regimes could be altered to reducing woody vegetation cover or slow thickening.[8] The dominant view to emerge from the research in the mid- to late-20th century and early 2000s was that woody thickening was a form of land degradation caused by grazing and

---

No.13. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549442/view?partId=nla.obj-3572592114 (17 August 2026); Barker, P.J., Booth, C.A. (1980) A report of Inedible Shrub Invasion in the North-Western Corner of New South Wales. Western District Technical Bulletin No.16. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549502/view?partId=nla.obj-3572604409 (17 August 2026); Pressland, A. (1984) Productivity and management of western Queensland's rangelands. Australian Rangeland Journal 6(1) 26-45.

[6] Condon, R. (1979) Pastoral Management, Economics and Land Use Options in the Poplar Box (Eucalyptus populnea) Lands of New South Wales. Australian Rangeland Journal 1(4), 260–266; Booth, C.A., Barker, P.J. (1980) Inedible Shrub Regeneration in the North West Corner of New South Wales. Western District Technical Bulletin No.13. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549442/view?partId=nla.obj-3572592114 (17 August 2026); Barker, P.J., Booth, C.A. (1980) A report of Inedible Shrub Invasion in the North-Western Corner of New South Wales. Western District Technical Bulletin No.16. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549502/view?partId=nla.obj-3572604409 (17 August 2026); Noble, J. C. (1997) The Delicate and Noxious Scrub: CSIRO Studies on Native Tree and Shrub Proliferation in the Semi-Arid Woodlands of Eastern Australia. CSIRO Publishing, Melbourne; Beale, I. (1986) Grazing Land Productivity and Stability. Report for The Australian Wool Corporation. Queensland Department of Primary Industries, Brisbane; Harrington, G.N. (1979) The effect of feral goats and sheep on tree and shrub populations in a semi-arid woodland. Australian Rangelands Journal 1(4), 334-345; Harrington, G.N., Oxley, R., Tongway, D. (1979) The effects of European settlement and domestic stock on the biological system in polar box (Eucalyptus populnea) lands. Australian Rangelands Journal 1(4), 271-279; NSW Inter-departmental Committee (1969) Report of the Inter-Departmental Committee on Scrub and Timber Growth in the Cobar-Byrock District and Other Areas of the Western Division of New South Wales. NSW Government Printer, Sydney; Beale, I. (2004) Report to the Productivity Commission: Tree and shrub thickening in the Murweh Shire. Productivity Commission, Canberra.

[7] Harrington, G. (1979) Estimation of above ground biomass of trees and shrubs in a *Eucatyptus populnea* F. Muell. woodland using regression of mass on trunk diameter and plant height. Australian Journal of Botany 27, 135-143; Beale, I. (1986) Grazing Land Productivity and Stability. Report for The Australian Wool Corporation. Queensland Department of Primary Industries, Brisbane.

[8] Moore, C. (1973) Some observations on ecology and control of woody weeds on mulga lands in northwestern New South Wales. Tropical Grasslands 7(1), 79-88; Harrington, G.N. (1979) The effect of feral goats and sheep on tree and shrub populations in a semi-arid woodland. Australian Rangelands Journal 1(4), 334-345; Hodgkinson, K., Harrington, G. (1985) The case for prescribed burning to control shrubs in eastern semi-arid woodlands. Australian Rangelands Journal 7(2), 64-74; Downing, B. (1986) Goat and sheep grazing in shrub-infested semi-arid woodlands of New South Wales. Australian Rangeland Journal 8, 140–150; Noble, J. C. (1997) The Delicate and Noxious Scrub: CSIRO Studies on Native Tree and Shrub Proliferation in the Semi-Arid Woodlands of Eastern Australia. CSIRO Publishing, Melbourne; Scanlan, J., Pressland, A. (1984) Major woody weeds of western Queensland and their control. Queensland Department of Primary Industry, Brisbane; Harrington, G., Wilson, A., Young, M. (eds) (1984) Management of Australia's Rangelands. CSIRO, Melbourne; White, A., Robards, G. (1997) Grazing studies reveal camels have limited potential to control woody weeds in western New South Wales. Range Management Newsletter (November), 8-14. See also Irons, N., Quinlan, E. (1988) A Review of Information Relevant to the Mulga Rangelands of Western New South Wales. Technical Report No. 5. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3381513632/view?partId=nla.obj-3381525636#page/n2/mode/1up (17 August 2026); Jacobs, S. (1988) A Graziers' Guide to the Mulga Country of Western New South Wales. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3381354138/view?partId=nla.obj-3381357173#page/n23/mode/1up (17 August 2026); Wilson, A.D., Mulham, W.E., Leigh, J.H. (1976). A note on the effects of browsing by feral goats on a belah (Casuarina cristata) – rosewood (Heterodendrum oleifolium) woodland. Australian Rangeland Journal 1(1), 7-12; Squires, V.R. (1980) Chemical and botanical composition of the diets of oesophageally fistulated sheep, cattle and goats in a semi-arid *Eucalyptus populnea* woodland community. Australian Rangeland Journal 2(1), 94-103; Niven, D.R., Lehane, K.J., Landsberg, L.W. (1980) Goats fail to control hopbush. Queensland Agricultural Journal 106, 532.

related changes in fire regimes (i.e. grazing reducing groundcover and thereby reducing the capacity of the landscape to carry fire, which can kill young trees and shrubs).[9] This view led to the passage of vegetation management laws that allowed for the clearing of "invasive native species" in remnant native vegetation on the premise that the clearing helped restore the vegetation to a more "natural condition".[10] Vegetation laws based on this premise remain in place in New South Wales and Queensland.[11]

[9] Noble, J. C. (1997) The Delicate and Noxious Scrub: CSIRO Studies on Native Tree and Shrub Proliferation in the Semi-Arid Woodlands of Eastern Australia. CSIRO Publishing, Melbourne; CSIRO Land Resources Management (1980) Research Report 1978–9. CSIRO, Perth; Central West Catchment Management Authority and the Western Catchment Management Authority (2010) Managing invasive native scrub to rehabilitate native pastures and open woodlands: A Best Management Practice Guide for the Central West and Western Catchments. Central West Catchment Management Authority and the Western Catchment Management Authority, Wellington and Cobar; Central West Local Land Services and Western Local Land Services (2014) Managing invasive native scrub to rehabilitate native pastures and open woodlands: A Best Management Practice Guide for the Central West and Western Regions. Local Land Services, Sydney; Science and Information Board (2005) Clearing/thinning of native vegetation known as invasive native scrub under the Native Vegetation Act 2003: Collation of Discussion Paper submissions and responses from the Invasive Native Scrub Team. NSW Government, Sydney; Friedel, M., Morton, S. (2023) A history of CSIRO'S Central Australian Laboratory, 1: 1953–80: pastoral land research. Historical Records of Australian Science 34(1), 36–49.

[10] *Native Vegetation Conservation Act 1997* (NSW), Schedule 5.4 & *Western Lands Regulation 1997* (NSW), Schedule 4; *Native Vegetation Act 2003* (NSW); NSW Government (2006) Native vegetation management in NSW: Managing invasive native scrub. Information Sheet No.9. NSW Government, Sydney; Stokes, R. (2014) Clearing of Invasive Native Species: Order made under clause 38 of the Native Vegetation Regulations 2013. NSW Government, Sydney; Office of Environment and Heritage (2015) Landholder Guide: Guidelines for applying the Clearing of Invasive Native Species Ministerial Order (INS self-assessable code). NSW Government, Sydney; Vegetation Management and Other Legislation Amendment Bill 2004 (Qld) (provisions concerning thinning of thickened vegetation and encroachment); Queensland Government (2013) Managing thickened vegetation in the Mulga Lands: A self-assessable vegetation clearing code. Queensland Government, Brisbane; Queensland Government (2013) Managing thickened vegetation in the Brigalow Belt, Central Queensland Coast and Desert Uplands bioregions: A self-assessable vegetation clearing code. Queensland Government, Brisbane.

[11] Land Management (Native Vegetation) Code 2018 (NSW), Part 2; Queensland Government (2020) State Code 16: Native vegetation clearing. Queensland Government, Brisbane; Department of Resources (2020) State development assessment provisions guidance material – State Code 16: Native vegetation clearing. Queensland Government, Brisbane. The managing thickened vegetation clearing codes were revoked in 2018 after review by the Queensland Herbarium and CSIRO. However, thinning of thickened native vegetation is still allowed with development approval granted under State Code 16.

Figure A1. Example of woody thickening, property near Wanaaring in far western New South Wales – site photos from same location in 1966, 1977 and 1979



(a) In 1966, the site is open country with shrubs in the background and small number of young trees (mostly mulga) in foreground



(b) By 1977, the site has experienced a significant increase in the density of woody vegetation – mulga to the left and right of the fence have grown, while punty bush and narrow-leaved hopbush have grown in the foreground.



(c) In 1979, the site shows continued woody thickening relative to 1977, with material increase in the size and density of punty bush and narrow-leaved hopbush.

Source: Booth, C.A., Barker, P.J. (1981) Shrub Invasion on Sandplain Country West of Wanaaring, New South Wales. Journal of the Soil Conservation Service of New South Wales 37(2), 65-70. Available at: https://nla.gov.au/nla.obj-768269711/view?partId=nla.obj-768291545#page/n14/mode/1up (3 August 2026).

While the notion that woody thickening was a symptom of poor land management practices dominated, it was not uncontested. The main alternative perspective amongst rangeland ecologists was that woody thickening was mostly a product of variability in rainfall and plant water availability, and that grazing impacts were generally relatively small (but could be either positive or negative, depending on the context).[12] Some also suggested it was partly attributable to 'CO_2 fertilisation'; higher atmospheric concentrations of CO_2 increasing plant water-use efficiency and prompting additional vegetation growth.[13] The resulting debate about this issue was highly controversial at the time because of the links to land clearing and vegetation management laws.[14] However, over the course of the 30-year debate, it was never contemplated that grazing was causing widespread tree loss, as claimed by those now trying to defend HIR projects.[15] If grazing had this effect, there would be no concern about woody thickening. Equally, if grazing was generally effective in preventing regeneration:

- it would not be necessary for landholders in western Queensland and New South Wales to routinely clear 300,000-500,000 ha per year of woody regrowth that has returned after being cleared explicitly for grazing;[16] and

---

[12] Butler, D. et al. (2018) Science supporting revision of codes for self-assessed vegetation thinning and fodder harvesting in Queensland – a summary for peer review. Department of Environment and Science. Queensland Government, Brisbane; Metcalfe, D. et al. (2018) Review of Science supporting revision of codes for self-assessed vegetation thinning and fodder harvesting in Queensland. A report for the Department of Environment and Science, Brisbane. CSIRO, Australia; NSW Science and Information Board (2004) Clearing/thinning of native vegetation known as invasive scrub under the Native Vegetation Act 2003: Discussion paper. NSW Government, Sydney; Fensham, R.J., Fairfax, R.J., Archer, S.R. (2005) Rainfall, land use and woody vegetation cover change in semi-arid Australian savanna. Journal of Ecology 93, 596–606; Fensham, R., Powell, O., Horne, J. (2011) Rail survey plans to remote sensing: vegetation change in the Mulga Lands of eastern Australia and its implications for land-use. Rangeland Journal 33, 229-238; Fensham, R. et al. (2012) Potential aboveground biomass in drought-prone forest used for rangeland pastoralism. Ecological Applications 22, 894–908; McKeon, G. et al. (2004) Pasture degradation and recovery in Australia's rangelands. Learning from History. Queensland Department of Natural Resources, Mines and Energy, Indooroopilly. On the role of fire, see Silcock, J. et al. (2016) A 150-year fire history of mulga (*Acacia aneura* F. Muell. ex Benth.) dominated vegetation in semiarid Queensland, Australia. Rangeland Journal 38, 391-415.

[13] Archer, S.R. et al. (2017) Woody Plant Encroachment: Causes and Consequences. In Briske, D. (ed) Rangeland Systems: Processes, Management and Challenges. Springer, USA, Chapter 2; Gifford, R., Howden, M. (2001) Vegetation thickening in an ecological perspective: significance to national greenhouse gas inventories. Environmental Science & Policy 4, 59–72; Archer, S. et al. (1995) Mechanisms of shrubland expansion: land use, climate or CO2? Climatic Change 29, 91-99.

[14] Beale, I. (2004) Report to the Productivity Commission: Tree and shrub thickening in the Murweh Shire. Productivity Commission, Canberra.

[15] Clean Energy Regulator and Department of Climate Change, Energy, the Environment and Water (2023) Joint CER/DCCEEW response to ANU papers on Human Induced Regeneration. Commonwealth of Australia, Canberra. Available at: https://cer.gov.au/news-and-media/news/2023/june/joint-cerdcceew-response-to-anu-papers-human-induced-regeneration (3 August 2026); Clean Energy Regulator (2022) Additional Literature – impacts of grazing animals on regenerating vegetation. Clean Energy Regulator, Canberra; Waters, C. et al. (2025) Grazing management of Australian native woody regeneration as an effective nature-based climate-change solution. Rangeland Journal 47(2), RJ24032. Prior to the emergence of HIR projects, there was even a debate about whether sequestration associated with woody thickening should be counted towards Australia's greenhouse gas mitigation targets on the basis it was human-induced through grazing and fire management. See: Burrows, W. et al. (2002) Growth and carbon stock change in eucalypt woodlands in northeast Australia: ecological and greenhouse sink implications. Global Change Biology 8, 769-784; Henry, B. et al. (2002) A review of the potential role of greenhouse gas abatement in native vegetation management in Queensland's rangelands. Rangeland Journal 24(1), 112-132; Gifford, R., Howden, M. (2001) Vegetation thickening in an ecological perspective: significance to national greenhouse gas inventories. Environmental Science & Policy 4, 59–72.

[16] Queensland Government (2026) Statewide Landcover and Trees Study (SLATS): 2023–24 SLATS Clearing Report. Queensland Government, Brisbane. Available at: https://www.qld.gov.au/environment/land/management/mapping/statewide-monitoring/slats/slats-reports (17 August 2026); NSW Department of Climate Change, Energy, the Environment and Water (2026) SLATS Dashboard. NSW Government, Sydney. Available at: https://www.seed.nsw.gov.au/slats-dashboard (17 August 2026).

- the clearing of mulga (*Acacia aneura*) as a sustainable fodder resource would not occur because the resource would gradually disappear.[17]

Against this backdrop, it came as a surprise when *The Garnaut Climate Change Review* of 2008 suggested that "a strategic property management program" could be implemented to restore Australia's degraded rangelands and thereby sequester vast quantities of carbon in soils and vegetation.[18] According to the Review, such a program could result in the rangelands absorbing "at least half of Australia's current annual emissions or some 250 Mt for several decades". So enthusiastic was the Review about this opportunity that it recommended immediate action:

> The mitigation gains are potentially so large that it is important for Australia to commence work on program design and implementation even before the issues of coverage, national and international, are fully resolved.[19]

Prompted by this enthusiasm, the Queensland Government engaged CSIRO to explore and refine the analysis in the Garnaut Review and, specifically, to analyse the potential abatement opportunities associated with rural land management.[20] In the executive summary to the report, the CSIRO suggested there was substantial potential abatement across Australia's rangelands: 100 $MtCO_2$-e per year through the rehabilitation of overgrazed rangelands and consequential carbon sequestration in restored soils and native vegetation. However, they tempered this finding with the qualification that the regeneration of rangelands and mulga was amongst "the most difficult to implement" because of the "high level of uncertainty about carbon storage".[21]

In the body of the report, the chapter devoted to the rehabilitation of overgrazed rangelands, by the CSIRO's Roger Gifford and John McIvor, was far more pessimistic about the prospect of sequestering significant amounts of carbon in rangelands through improved grazing practices. The authors warned of the difficulty in providing reliable estimates of abatement potential in rangeland ecosystems, commenting that "any estimation of the carbon sequestration potential of grazing management is necessarily highly approximate - perhaps even an exercise in wishful thinking".[22] They also cautioned about the difficulty of sequestering carbon in rangelands and of accurately measuring and attributing any observed increases to management changes. This caution was because of the inherent variability of rangeland ecosystems, whereby they go

---

[17] Butler, D. et al. (2018) Science supporting revision of codes for self-assessed vegetation thinning and fodder harvesting in Queensland – a summary for peer review. Department of Environment and Science. Queensland Government, Brisbane; Metcalfe, D. et al. (2018) Review of Science supporting revision of codes for self-assessed vegetation thinning and fodder harvesting in Queensland. A report for the Department of Environment and Science, Brisbane. CSIRO, Australia; Queensland Government (2023) Accepted development vegetation clearing code: Managing fodder harvesting. Queensland Government, Brisbane. Available at: https://www.qld.gov.au/__data/assets/pdf_file/0020/552701/managing-fodder-clearing-code.pdf (17 August 2026).

[18] Garnaut, R. (2008) The Garnaut Climate Change Review: Final Report. Cambridge University Press, Melbourne, p 557. Available at: https://library.bsl.org.au/jspui/bitstream/1/1002/1/Garnaut%20Climate%20Change%20Review%20-%20Final%20Report2008.pdf (3 August 2026).

[19] Ibid, p 557.

[20] Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia.

[21] Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia, p 12. See also Eady, S., Grundy, M., Battaglia, M. (2009) Overview. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 1, Table 1-4, p 20.

[22] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 66.

through natural cycles of "build-up" and "collapse".[23] The ups and downs in the carbon stocks make them hard to measure accurately. The fluctuations in the carbon stocks also make it difficult to separate out the effects of management changes from natural variability. Lastly, the periodic collapses release any carbon that may have been accumulated in the build-up phase through management changes back into the atmosphere, negating their climate benefits.

Of direct relevance to HIR, Gifford and McIvor suggested that, rather the increasing woody vegetation cover, *reducing grazing pressure* could stop woody thickening or even reduce woody vegetation cover. In contrast to what the Government and industry now claim is the premise of the HIR method, Gifford and McIvor indicated that increased grazing could be used in some rangeland ecosystems (semi-arid tropical woodlands) to induce woody thickening, after which the grazing potential of the land would decline as the "trees and shrubs come to dominate".[24] They also highlighted the risk of fraud in schemes intended to promote sequestration in rangelands:

> Trading changes in ecosystem C stocks is replete with opportunity for fraudulent claims and financial transactions that are ineffective at securing permanently sequestered C [carbon]. Being sure that the risk of fraud has been properly addressed is a major barrier to formulation of a successful C-sequestration scheme. The technical methodological potential for fraudulent activities and transactions relating to ecosystem carbon storage, leading to little or no actual positive climate benefits on the multi-decadal timescale of climate change processes for GHG mitigation, is large.[25]

With foresight (verging on clairvoyance) about what would subsequently occur with HIR, they remarked:

> If it is found that the cost of direct statistically significant validation by on-site measurement is so high, and so delayed, that indirect systems based on C-sequestration computer models and deemed default sinks or regionally averaged sinks needs to be adopted, then fraud will be especially problematic to counter.[26]

Instead of heeding Gifford and McIvor's warnings, the Australian Government pushed ahead with the pursuit of the illusive carbon abatement opportunities in the outback. Its first step along this path was to provide a $9.2 million grant to RM Williams Agricultural Holdings to support the purchase of historic Henbury Station, located 130 kilometres south of Alice Springs in the Northern Territory. The plan was that Henbury Station would become the "world's largest

---

[23] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 65.

[24] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 66. A similar recommendation was made by Burrows, W. et al. (2002) Growth and carbon stock change in eucalypt woodlands in northeast Australia: ecological and greenhouse sink implications. Global Change Biology 8, 769-784, p 781.

[25] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 70.

[26] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 70.

carbon farm".[27] This outcome would be achieved by destocking the property, which the proponents argued would sequester additional carbon in vegetation and soils through the restoration of native ecosystems. The vehicle for turning the sequestration into financial returns was the proposed Carbon Farming Initiative "Rangeland Restoration method",[28] which would facilitate the issuance of ACCUs to the project.

The Rangeland Restoration method and HIR method were progressed through the ACCU scheme's assessment and approval system at the same time, starting in 2012. HIR was constructed as the "sister" method for the environmental plantings method that was approved in 2012.[29] Both the environmental plantings and HIR methods were designed for cleared lands and used a simplified form of FullCAM (known as the Reforestation Modelling Tool) to estimate sequestration. As discussed in Part 4.1, the model is based on the premise that the land starts with little or no woody biomass, and the forests engendered by projects then grow in an even-aged manner towards the land's maximum above-ground biomass potential.

The main difference between the two methods was (and remains) that environmental plantings required the forest to be planted using seedlings or seed, while HIR explicitly prohibited the use of plantings and required the forest to be regenerated from in situ sources. Ironically, Gifford and McIvor recommended human-induced regeneration of cleared lands in their contribution to the 2009 CSIRO report. They suggested that the removal of grazing on previously cleared lands "could allow the gradual recovery of forest and hence of high C stocks above and below".[30]

While the Rangeland Restoration and HIR methods were progressing through the ACCU method development process at the same time, they met very different ends. The HIR method was endorsed by the Domestic Offsets Integrity Committee in late 2012 and made by Mark Dreyfus (the then Parliamentary Secretary for Climate Change and Energy Efficiency) in January 2013.[31] The Rangeland Restoration method was sent back to the proponent by the Domestic Offsets Integrity Committee in 2012 and again in 2013, before it was shelved. The method was never even put out for public consultation, which meant that a technical scientific review was also

---

[27] Brain, C., Martin, D. (2012) From cattle to carbon. ABC Background Briefing. Available at: https://www.abc.net.au/listen/programs/backgroundbriefing/4421892 (3 August 2026); Brain, C. (2013) Henbury Station back on the market. ABC News. Available at: https://www.abc.net.au/news/rural/2013-08-28/henbury-station-rm-williams-sale-market/4916426 (3 August 2026); Rowley, L. (2022) Carbon project pioneer Henbury Station sells for $32m. Beef Central, 28 March. Available at: https://www.beefcentral.com/property/carbon-project-pioneer-henbury-station-sells-for-32m/ (3 August 2026).

[28] Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (2012) Rangeland restoration projects. Commonwealth of Australia, Canberra. Available at: http://web.archive.org/web/20130814232541/http:/climatechange.gov.au/reducing-carbon/carbon-farming-initiative/methodologies/methodology-proposals/rangeland-restoration (3 August 2026).

[29] *Carbon Farming (Quantifying Carbon Sequestration by Permanent Environmental Plantings of Native Tree Species using the CFI Reforestation Modelling Tool) Methodology Determination 2012*. See: Dreyfus, M. (2012) Landholders to earn credits from regenerating native forest. Media Release, 17 August. The Hon Mark Dreyfus QC MP - Parliamentary Secretary for Climate Change and Energy Efficiency. Commonwealth of Australia, Canberra. Available at: http://web.archive.org/web/20121206104350/http://climatechange.gov.au/minister/mark-dreyfus/2012/media-releases/August/MR-12-35.aspx (3 August 2026); The Australian (2012) Potential for carbon credits from regenerating native forest. The Australian, 17 August. Available at: https://www.theaustralian.com.au/business/business-spectator/potential-for-carbon-credits-from-regenerating-native-forest/news-story/bff21b1a31fe6d79eb753e9fe23a37f1 (3 August 2026).

[30] Gifford, R., McIvor, J. (2009) Rehabilitate overgrazed rangelands, restoring soil and vegetation carbon-balance. In Eady, S., Grundy, M., Battaglia, M., Keating, B. (eds) (2009) An Analysis of greenhouse gas mitigation and carbon biosequestration opportunities from rural land use. CSIRO, St Lucia. Chapter 5, p 66.

[31] Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even-Aged Native Forest) Methodology Determination 2013. Federal Register of Legislative Instruments F2013L00162 (HIR2013).

never conducted. While a formal explanation for why the Rangeland Restoration method was abandoned has never been published, in a Ministerial briefing note prepared in September 2018, the Department wrote:

> The Department has previously worked with rangeland specialists to undertake extensive investigation in this area. This work found that the variability of rangeland systems and associated fluctuations in carbon could make it difficult to continue to build carbon stocks over time, and to maintain the carbon stocks. For similar reasons, the investigations found estimating existing carbon stocks and changes in carbon stocks, and attributing the changes to management actions, could be challenging.[32]

The demise of the Rangeland Restoration method drew public attention because it resulted in the collapse of the Henbury Station carbon farming project. As the receivers said in the aftermath, "without the methodology, Henbury wasn't generating any cash flow".[33] RM Williams Agricultural Holdings went into receivership in mid-2013 and Henbury was subsequently sold in 2014 for $8.5 million, significantly below the 2011 $13 million purchase price.[34] At the time the property was resold in mid-2014—after the HIR method had been made—news reporting commented that: "[t]o this day, the 'methodology' required to generate carbon credits from Henbury has not been approved".[35] Yet, less than a decade later, Henbury Station was almost surrounded by HIR projects claiming they are regenerating native forests in uncleared areas by reducing grazing pressure (Figure A2).[36] This was precisely the thing that had failed to get approval through the Rangeland Restoration method in 2012 and 2013.

The progression of HIR projects from cleared to uncleared lands is difficult to explain. From the time the method commenced in January 2013 until December 2013, no HIR projects were registered. The first project registered was the Arbon-Tooligie HIR project (EOP100275). It was registered on 11 December 2013, three months after the 2013 federal election won by the Coalition. Unlike most of the HIR projects that would follow, the Arbon-Tooligie HIR project is located in a highly modified landscape on South Australia's Eyre Peninsula where a substantial proportion of the native vegetation has been cleared for grazing and cropping.

The next project registered was the Urisino Regenerative Ecosystem Project (EOP100637), on 30 May 2014. The property is located immediately west of Wanaaring in outback New South Wales, in an area that was the subject of a number of woody thickening studies in the latter half of the

---

[32] Department of the Environment and Energy (2018) Ministerial Information Request: PDR: MB18-000634. Commonwealth of Australia, Canberra. FOI 190317, Document 41, p 3 (p 486 of FOI). See also Cook, D., Hunt, L., Liedloff, A., Richards, A. (2011) Towards a CFI methodology for carbon sequestration in Australian rangelands: effects of fire and grazing in the north. CSIRO, Darwin. FOI 2026-23(a).

[33] Brann, M. (2014) 'Large percentage' of Henbury money returns to taxpayers. ABC News. Available at: https://www.abc.net.au/news/rural/2014-06-09/henbury-station-sold-carbon-farming/5509950 (3 August 2026).

[34] Brain, C. (2013) R.M. Williams Agricultural Holdings goes into receivership. ABC News. Available at: https://www.abc.net.au/news/rural/2013-06-28/receivership-rm-williams-henbury/4788718 (3 August 2026); Brann, M. (2014) 'Large percentage' of Henbury money returns to taxpayers. ABC News. Available at: https://www.abc.net.au/news/rural/2014-06-09/henbury-station-sold-carbon-farming/5509950 (3 August 2026); Beef Central (2013) RM Williams carbon projects plunge into receivership. Available at: https://www.beefcentral.com/news/rm-williams-carbon-projects-plunge-into-receivership/ (3 August 2026).

[35] Brann, M. (2014) 'Large percentage' of Henbury money returns to taxpayers. ABC News. Available at: https://www.abc.net.au/news/rural/2014-06-09/henbury-station-sold-carbon-farming/5509950 (3 August 2026).

[36] Clean Energy Regulator (2026) ACCU project and contract register. Commonwealth of Australia, Canberra. Available at: https://cer.gov.au/markets/reports-and-data/accu-project-and-contract-register (30 July 2026).

20th century (Figure A2).[37] Almost all of the land (>99.9%) included in the project is mapped as extant native vegetation, making it a highly peculiar location for a HIR project. The application for the registration of the project was submitted on 6 September 2013 by Australian Carbon Traders, the night before the federal election, and was seemingly rushed as it was missing key information, including signatures.[38] Prior to submitting the application, the owners of Urisino had been trying to generate carbon offsets on the property since at least 2008.[39]

Two further 'outback' projects on largely uncleared lands followed in 2014: Runnymede Regeneration Project (EOP100548)[40] and Kinchela Regeneration Project (EOP100570), both in July (Figure A2). The agent for Runnymede is Select Carbon Pty Ltd, which was bought out by Shell Australia in 2020.[41] The agent for Kinchela is Climate Friendly Pty Ltd. In November 2014, Climate Friendly described itself as being involved in the development of Urisino in partnership with Australian Carbon Traders as well as its then shareholder South Pole.[42] Today, Climate Friendly's ultimate holding company (Eagle Holdco Pty Ltd) is majority owned by companies connected with Adamantem Capital,[43] with oil and gas producer Mitsui & Co also holding a significant stake.[44]

[37] Booth, C.A., Barker, P.J. (1981) Shrub Invasion on Sandplain Country West of Wanaaring, New South Wales. Journal of the Soil Conservation Service of New South Wales 37(2), 65-70; Booth, C.A., Barker, P.J. (1980) Inedible Shrub Regeneration in the North West Corner of New South Wales. Western District Technical Bulletin No.13. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549442/view?partId=nla.obj-3572592114 (17 August 2026); Barker, P.J., Booth, C.A. (1980) A report of Inedible Shrub Invasion in the North-Western Corner of New South Wales. Western District Technical Bulletin No.16. Soil Conservation Service of New South Wales. Available at: https://nla.gov.au/nla.obj-3572549502/view?partId=nla.obj-3572604409 (17 August 2026).

[38] Clean Energy Regulator (2013) CER-CFI-EOPS Application for Declaration of an Eligible Offsets Project (sequestration)_Urisino. Commonwealth of Australia, Canberra. FOI 250319, Document 1, p 1 (p 1 of FOI). See also Documents 3-7 (pp 3-14 of FOI).

[39] Australian Carbon Traders (2008) Projects Registry. Australian Carbon Traders, Castlemaine. Available at: http://web.archive.org/web/20080913025705/http://www.australiancarbontraders.com/carbonmart/public/projects (23 October 2026).

[40] The Runnymede Regeneration Project was first registered under a different name and method – the Runnymede Native Forest Protection Project under the Avoided Deforestation method. On 26 March 2015, the project became the Runnymede Regeneration Project under the HIR method.

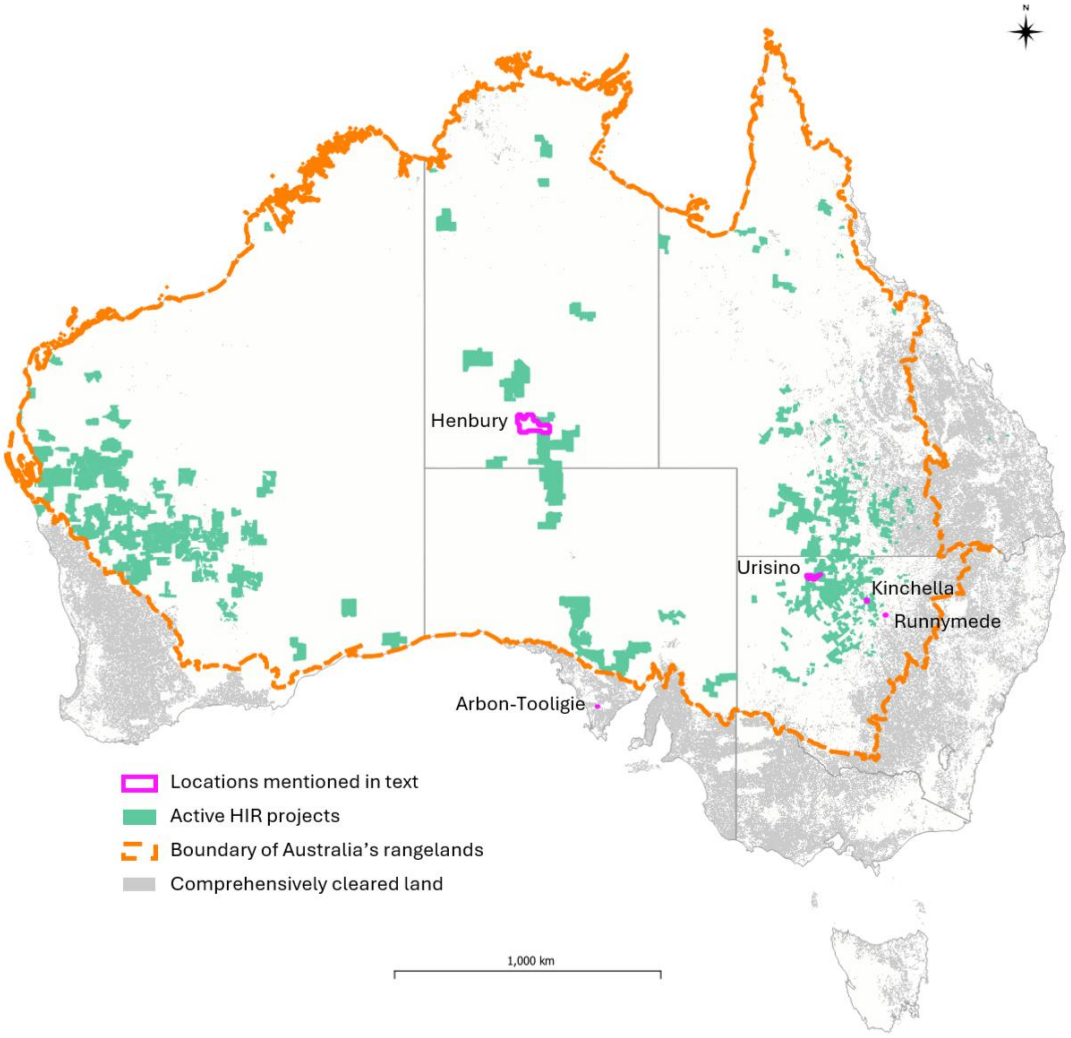
[41] Select Carbon (2020) Shell to acquire Select Carbon. Select Carbon, Perth. Available at: https://www.selectcarbon.com/news-insights/shell-to-acquire-environmental-services-company-select-carbon/ (23 September 2026).

[42] Climate Friendly (2014) First Forest Regeneration Project Issued with Carbon Credits. Media Release. Sydney, New South Wales. Available at: https://web.archive.org/web/20150309123246/http://www.climatefriendly.com/AboutUs/Newsroom/News/First_Forest_Regeneration_Project_Issued_with_Carbon_Credits/ (10 November 2026); South Pole (2017) South Pole Group consolidates hold on Australian Climate Friendly. Media Release. Available at: https://www.southpole.com/news/south-pole-group-consolidates-hold-on-climate-friendly (10 November 2026).

[43] Climate Friendly (2026) About Us. Climate Friendly, Sydney. Available at: https://www.climatefriendly.com/about-us/ (23 September 2026); Climate Friendly (2021) Climate Friendly announces strategic investment from Adamantem Capital. Media Release. Available at: https://www.climatefriendly.com/news/climate-friendly-announces-strategic-investment-from-adamantem-capital/ (23 September 2026).

[44] Climate Friendly (2022) Climate Friendly and Adamantem welcome Mitsui as minority partner. Media Release. Sydney, New South Wales. Available at: https://www.climatefriendly.com/news/climate-friendly-and-adamantem-welcome-mitsui-as-minority-partner/ (23 September 2026).

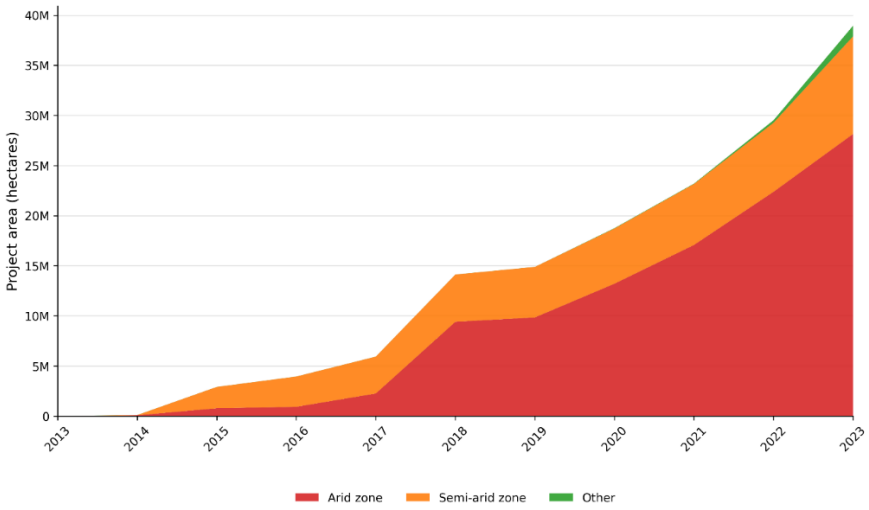
Figure A2. Key locations in the history of the HIR method



Source: Clean Energy Regulator (2026) Area-based Australian Carbon Credit Unit (ACCU) Scheme projects. Commonwealth of Australia, Canberra. Available at: https://www.data.gov.au/data/dataset/accu_project_mapping (30 July 2026); Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) National Vegetation Information System, version 6. NVIS6_0_AUST_EXT. Commonwealth of Australia, Canberra; NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2020) NSW State Vegetation Type Map – SVTM. NSW Government, Sydney. Available at: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map (10 August 2026).

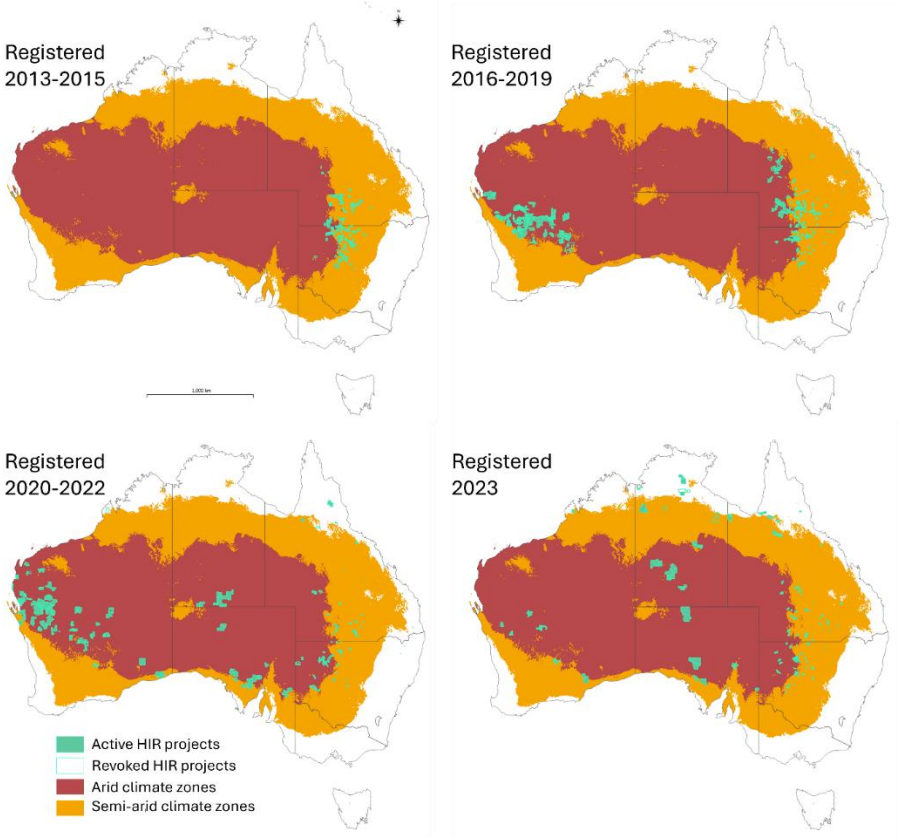
After the registration of Runnymede and Kinchela in 2014, the method took off. One hundred and twenty-six (126) HIR projects were registered in the 2015 calendar year. The overwhelming majority of these projects were located on lands containing extant native vegetation where it is biophysically impossible to regenerate even-aged native forests. From there, things only got progressively worse, with the carbon service providers and proponents seemingly testing the limits of what the Regulator would accept. As Figures A3 and A4 show, HIR projects moved further and further into arid (desert) regions, where the legal and method integrity issues should have been obvious to even a casual observer.

Figure A3. Cumulative HIR project area in arid, semi-arid and other regions, by date of project registration



Source: Clean Energy Regulator (2026) Area-based Australian Carbon Credit Unit (ACCU) Scheme projects. Commonwealth of Australia, Canberra. Available at: https://www.data.gov.au/data/dataset/accu_project_mapping (30 July 2026); Beck et al. (2023).[45]

Figure A4. HIR project locations by year of project registration overlaid on climate zones



Source: Clean Energy Regulator (2026) Area-based Australian Carbon Credit Unit (ACCU) Scheme projects. Commonwealth of Australia, Canberra. Available at: https://www.data.gov.au/data/dataset/accu_project_mapping (30 July 2026); Beck et al. (2023).

[45] Beck, H. E., T. R. McVicar, N. Vergopolan, A. Berg, N. J. Lutsko, A. Dufour, Z. Zeng, X. Jiang, A. I. J. M. van Dijk, and D. G. Miralles (2023) High-resolution (1 km) Köppen-Geiger maps for 1901–2099 based on constrained CMIP6 projections, Scientific Data 10, 724. Mapping for 1991-2020 period where Arid = zones “Bwh” and “Bwk” and semi-arid = zones “Bsh” and “Bsk”.

In late 2017, the ERAC initiated a review of the HIR method and a similar method known as "Native Forest from Managed Regrowth" (NFMR).[46] The review was controversial and contested because of concerns identified by the ERAC. The ERAC proceeded on the basis that HIR projects were located on cleared lands, consistent with the method requirements.[47] Despite being unaware of the extent to which projects had been located on uncleared lands, the ERAC quickly became concerned about two issues: the inclusion of land in credited areas that appeared incapable of attaining forest cover in a timeframe consistent with FullCAM's estimates; and the inclusion of land in credited areas that lacked the potential to attain forest cover or that already had forest cover when the projects began.

To address the ERAC's concerns and stave off the suspension of the methods, the Regulator committed to ensuring the projects were properly stratified so that areas containing pre-existing forests were removed from credited areas. The Department also prepared a new rule requiring 90% of credited areas of HIR and NFMR projects to achieve forest cover within 15 years, assessed at 0.2-ha scale (forest cover attainment rule). The rule was subsequently incorporated into the statutory rules (CFI Rules) made under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) (CFI Act).[48]

The forest cover attainment rule was structured around an empirical relationship between biomass in forest regeneration and crown cover in HIR regions. The relationship suggests forest cover (crown cover ≥20% from trees ≥2 metres, defined at 0.2 ha scale) should be achieved in stands of even-aged regeneration when live biomass (above and below ground) reaches 3.85 tonnes of carbon (tC) per hectare.[49] Modelling undertaken for the purposes of the ERAC review suggested this level of sequestration should be achieved after 10–14 years of unhindered modelled regeneration.[50] Based on this modelling, 15-years was chosen as a generous cut-off point when forest cover should have been achieved across the credited areas of most projects.

---

[46] *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013*.

[47] See Emissions Reduction Assurance Committee (2019) Review of the Human-Induced Regeneration and Native Forest from Managed Regrowth methods: Final Report. Commonwealth of Australia, Canberra, p 13, where the report states: "The decision to make the methods was prompted by the nature of the forest systems and agriculture undertaken in Australia's rangeland regions … . The native forests in these regions … have been cleared extensively for livestock grazing since European settlement. Soils in many of these lands still contain substantial native plant seed banks, which enable seedling establishment or recruitment when climatic and land management conditions allow germination and survival. Landholders generally suppress this regeneration through periodic clearing and livestock management practices. Grazing by feral animals and competition from weeds can also play a part in preventing the re-establishment of native forests and woodlands".

[48] *Carbon Credits (Carbon Farming Initiative) Rule 2015* (CFI Rules), s 9AA.

[49] This translates into 3.6–5.5 tC ha of live and dead biomass, based on FullCAM biomass allocation parameters. 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. Available at: https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a47ed442d5708f8dd669/public_assets/csiro-final-report-stand-biomass-and-canopy-cover.pdf (3 August 2026); Emissions Reduction Assurance Committee (2019) Review of the Human-Induced Regeneration and Native Forest from Managed Regrowth methods: Final Report. Commonwealth of Australia, Canberra, p 31. Available at: https://www.dcceew.gov.au/sites/default/files/documents/report-review-human-induced-regeneration-native-forest-managed-regrowth-methods.pdf (12 August 2026).

[50] Emissions Reduction Assurance Committee (2019) Review of the Human-Induced Regeneration and Native Forest from Managed Regrowth methods: Final Report. Commonwealth of Australia, Canberra. Available at: https://www.dcceew.gov.au/sites/default/files/documents/report-review-human-induced-regeneration-native-forest-managed-regrowth-methods.pdf (12 August 2026).

After intense lobbying by carbon service providers, the Government decided to give preferential treatment to projects registered before 15 August 2018. For these projects, the 15-year timeline for achieving forest cover runs from the date the projects were registered (or the date the proponent modelled the commencement of regeneration if it is after the date of registration). For projects registered after 15 August 2018, the forest attainment rule must be satisfied within 15-years of the date they model regeneration commencing. The preferential treatment given to pre-15 August 2018 projects means they generally have more than 20 years to meet the forest attainment rule requirements.

The Regulator's formal response to the ERAC review was released in May 2019, when it published new guidance on its interpretation of the method requirements. The guidance requires the credited areas of HIR projects to be broken into assessment cells of a prescribed size and for canopy cover to be assessed in each cell to ensure compliance with the initial stratification requirements and to ensure regeneration is progressing towards forest cover (Table A1).

The 'initial stratification gateway checks' are conducted in Years 1–5 and focus on whether the credited areas have been mapped in accordance with the method's land eligibility requirements. This check is followed by two 'regeneration gateway checks': the first in Years 6–10 and the second in Years 11–15. The regeneration gateway requirements get progressively more stringent, and the cells get progressively smaller, as projects approach the forest cover assessment date. This progression is based on the logic that credited areas will be re-stratified at each gateway to ensure only areas that satisfy the forest cover attainment rule remain.

Table A1. Initial stratification and regeneration gateway check requirements

Initial stratification gateway

Timing: Before submitting the first offset report due for submission after publication of the guidelines in 2019.
What: "Initial stratification must demonstrate, using the appropriate spatial scale that [credited areas] are on eligible land that does not contain pre-existing forest cover and only contains land with forest potential".
Guideline requirements: Credited areas must:
• exclude areas that had pre-existing forest cover at a scale of 0.2 or more hectares; and
• only include areas with forest potential, defined as areas with either:
  ○ ≥5% canopy cover of vegetation ≥ 2m height, assessed with cells at 200 to 1000-hectare scale, depending on the reporting year (see below); or
  ○ areas with sufficient trees and saplings on ground to achieve forest cover, based on sampling from plots.
Size of assessment cells:
• Year 1: 1000ha, or total area of CEA if less than 1000ha
• Year 2: 750ha, or total area of CEA if less than 750ha
• Year 3: 500ha, or total area of CEA if less than 500ha
• Year 4: 300ha, or total area of CEA if less than 300ha
• Year 5: 200ha, or total area of CEA if less than 200ha

First regeneration gateway
Timing: Once between the 6th and 10th year of the project. *What*: Credited areas must "be assessed and evidence must be demonstrated to show an increase in forest cover at the mapping scale appropriate to the relevant year. Remote sensing approaches must

use the latest imagery sourced for the relevant year the report is submitted in or within the period being reported on". *Guideline requirements*: Credited areas covered in offsets reports submitted from the 6th to 10th project year must satisfy one of three tests: • ≥7.5% canopy cover of vegetation over two metres in height at 100-hectare scale; or • 5% increase in canopy cover of vegetation over two metres in height over five years; or • sufficient trees and saplings on ground to achieve forest cover.
Second regeneration gateway
Timing: Once every five years from the 10th year of the project. *What*: Credited areas must "be assessed and evidence must be demonstrated to show an increase in forest cover at the mapping scale appropriate to the relevant year. Remote sensing approaches must use the latest imagery sourced for the relevant year the report is submitted in or within the period being reported on". *Guideline requirements*: Credited areas covered in offsets reports submitted from the 10th project year must satisfy one of two tests: • ≥10% canopy cover of vegetation over two metres in height at 10-hectare scale; or • 5% increase in canopy cover of vegetation over two metres in height over five years.

Source: Clean Energy Regulator (2019) Guidelines on stratification, evidence and records. For projects under the Human-Induced Regeneration of a Permanent Even-Aged Native Forest and Native Forest from Managed Regrowth methods. Commonwealth of Australia, Canberra. Available at: https://cer.gov.au/document_page/guidelines-stratification-evidence-and-records-hir-and-nfmr (10 August 2026).

While presented as an improvement, the Regulator's guidance conflicts with law as prescribed in the method. Most notably, it allows projects to satisfy the regeneration gateway checks based on the canopy cover provided by pre-existing trees and shrubs rather than new regeneration. For example, projects can satisfy the 1st regeneration gateway requirements if canopy cover from vegetation >2 m in height is ≥7.5% assessed at 100-hectare scale, regardless of whether the relevant trees were already present, or even mature, when the project started. Similarly, at the 2nd gateway, projects can satisfy the regeneration requirements if canopy cover from vegetation >2 m in height is ≥10% defined at 10-hectare scale. Again, projects are allowed to count cover provided by pre-existing mature trees and shrubs, provided they are more than 2 metres tall. By crafting the rules in this manner, the Regulator has allowed projects to continue to receive credits for areas where new regeneration is not occurring. This directly conflicts with the legal requirement in the method dictating that land included in credited areas must contain regeneration.[51] It also conflicts with the requirement that projects can only start modelling regeneration in FullCAM on or after "the date at which sufficient regeneration has occurred to demonstrate that the area of land: (a) has forest potential; and (b) has started to become native forest through regeneration".[52]

An alternative way projects can satisfy the 1st regeneration gateway requirements is to demonstrate that there are sufficient trees and saplings on the ground that have the potential to reach more than 2m in height and provide forest cover at maturity. Proponents that choose to do this estimate the number of trees and saplings by taking field measurements in "regeneration verification plots" created in each contiguous area or stratum in the credited area. This test is ecologically flawed because it assumes that all seedlings and saplings that are present in an

[51] HIR2015, ss 3.3(1)(c), 3.4(2)(b) & 3.5(1)(d); HIR2016, ss 15(2)(b) & 16(4)(a); HIR2018, ss 15(2)(b) & 16(4)(a).
[52] HIR2016, s 28(2); HIR2018, s 28(2). See HIR2013, s 4.5 and HIR2015, s 4.5.

area at project commencement will grow to maturity. This assumption ignores the effects of competition and attrition associated with seasonal variability on regeneration.[53] The test also allows proponents to count canopy cover from pre-existing mature trees when assessing whether it is possible for the area to achieve forest cover. This allowance conflicts with the legal requirements in the method, including the requirements that:

(a) the land included in credited areas must contain regeneration and the regeneration must be even-aged regeneration;

(b) proponents cannot model regeneration until it has occurred and the site has demonstrated forest potential; and

(c) the regeneration that is present on the land must be able to be modelled as a single event.[54]

There are precedents for courts issuing relief when governments and government agencies issue guidance or make statements concerning administration that conflict with the law.[55] Here, no third party is able to seek such relief because the CFI Act excludes third parties without a financial or proprietary interest in a project (e.g. environmental groups or other concerned Australians) from accessing the courts to uphold the law. As a result, the Regulator has continued to implement guidelines that are seemingly designed to ensure HIR projects continue to be credited, even when there is no regeneration.

During and after the ERAC review, the Regulator and Department tried to nullify concerns about the integrity of HIR projects and the method, but doubts remained. These concerns were subsequently voiced within the ERAC in 2019 and by researchers at The Australian National University (ANU) and University of New South Wales (UNSW) from January 2021, including by some of the authors of this report.[56]

The Regulator and ERAC responded by commissioning two reviews: a literature review on the impacts of grazing and weeds on regeneration of mulga (*Acacia aneura*) by Professor Rod Fensham from the University of Queensland (Fensham review); and a statistical analysis on the impacts of HIR projects on woody vegetation cover in credited areas by Stephen Beare and Raymond Chambers from AnalytEcon Pty Ltd (Beare and Chambers report).

The Fensham review's findings reflected the science and raised the same concerns voiced by the researchers from ANU and UNSW. The conclusion of the final report submitted to the Regulator states:

> The substantial body of research on mulga suggests under general land-use practices grazing cannot suppress mulga biomass. Under some, but not all circumstances, sheep browsing can suppress mulga regeneration, and retard, but not limit the recovery of

[53] Westoby, M. (1984) The self-thinning rule. In MacFadyen, A., Ford, E.D. (eds) Advances in ecological research. Academic Press, London and New York, pp 167–225.
[54] HIR2015, ss 3.3(1)(c) & 3.4(2)(b); HIR2016, ss 16(4)(a) & (b); HIR2018, ss 16(4)(a) & (b).
[55] Fitzgerald v Muldoon [1976] 2 NZLR 615; Humane Society International Inc v Minister for the Environment and Heritage (2003) 126 FCR 205; [2003] FCA 64.
[56] Macintosh, A., Butler, D., Evans, M. (2021) Additionality of Abatement under the Emissions Reduction Fund's Human-induced Regeneration (HIR) method. Draft paper. The Australian National University, Canberra; Macintosh, A., Butler, D., Larraondo, P.R, Ansell, D., Lavery, T. (2021) Integrity Issues with the Emissions Reduction Fund's Human-induced Regeneration (HIR) Method: Evidence and Solutions to the Problem. Draft paper. The Australian National University, Canberra.

> biomass potential. Despite browsing of mulga, there is overwhelming evidence that live biomass is ultimately controlled by the vicissitudes of climate. The manipulation of grazing and weed management will not bring about a permanent increase in the biomass of mulga vegetation .... Furthermore it is very difficult to determine whether changes of management from sheep to cattle, which could be perceived as potentially fostering mulga growth are in fact additional given the trend from cattle to sheep ... that is occurring in the regions of Australia where HIR projects have been registered.[57]

Faced with these adverse findings, the Regulator refused to finalise the report.

The Beare & Chambers report was seen as more favourable and was published on the Regulator's website on 5 November 2021,[58] along with a statement from the ERAC claiming the findings showed "the portfolio of HIR projects to be additional".[59] The report analysed 123 projects using the National Forest & Sparse Woody Vegetation (NFSW) dataset (version 5). NFSW is a national-scale dataset derived from Landsat imagery with a 25m x 25m resolution that assigns each 25m x 25m pixel in the dataset to one of three classes (forest, sparse woody or non-woody) based on estimated woody vegetation cover.[60] It is relied on by the Department to prepare the land component of Australia's National Greenhouse Accounts, was used extensively to map forests for the purposes of HIR projects and other ACCU projects, particularly Avoided Deforestation projects, and is also the prescribed dataset for assessing forest regeneration in HIR projects.[61] Importantly, because the NFSW dataset is relied on to prepare the National Greenhouse Accounts, if the regeneration associated with HIR projects was not appearing in the NFSW, it would also not be contributing to Australia's international climate change mitigation targets – which is the primary object of the CFI Act.[62]

Using this dataset, Beare and Chambers found that the 123 HIR projects had a statistically significant but small positive effect on 'woody cover' (forest plus sparse woody cover) relative to 'quasi-control' areas located on adjacent lands not in the credited areas. Twenty-three percent (23%) of the projects were assessed as having no, negative or almost no impact on woody cover relative to the trends in the comparison areas. The effect size found by Beare and Chambers across their whole sample equated to an average difference in the proportion of the credited

---

[57] Fensham, R. (2021) Review of current literature on suppression mechanisms identified in the Human-Induced Regeneration of a Permanent Even-Aged Native Forest method (specifically the management of livestock and feral animals), and the manner and extent to which they act to suppress the regeneration of native vegetation. Report for the Clean Energy Regulator. Final Draft. University of Queensland, Brisbane. Available at: https://cdn.prod.website-files.com/63fd8bef913cf579cacfa53b/64d04de36b645b27d694bfc5_Fensham%20final%20HIR%20report.pdf (11 August 2026).

[58] Beare, S., Chambers, R. (2021) Human induced regeneration: A spatiotemporal study. AnalytEcon Pty Ltd, Berry, NSW. Available at: https://www.dcceew.gov.au/sites/default/files/documents/human-induced-regeneration-spatiotemporal-study.pdf (3 August 2026).

[59] Emissions Reduction Assurance Committee (2021) Statement: ERAC consideration of Human-induced Regeneration Method. Commonwealth of Australia, Canberra. Climate Friendly published a similar statement on 9 November 2021. See Climate Friendly (2021) Peer reviewed study shows HIR carbon farming projects deliver real and measurable environmental outcomes. Available at: https://www.climatefriendly.com/peer-reviewed-study-shows-hir-carbon-farming-projects-deliver-real-and-measurable-environmental-outcomes/ (17 August 2026).

[60] 'Forest cover' refers to areas of at least 0.2 ha, where trees ≥2 metres in height provide crown cover of ≥20% of the land area. 'Sparse woody cover' refers to areas with 5-19% crown cover. 'Non-woody' refers to areas with <5% crown cover. Department of Climate Change, Energy, the Environment and Water (2025) National Inventory Report 2023, Volume I. Commonwealth of Australia, Canberra, p 367.

[61] Department of Climate Change, Energy, the Environment and Water (2025) National Inventory Report 2023, Volume I. Commonwealth of Australia, Canberra.

[62] CFI Act, s 3(2).

areas with 'woody cover' (i.e. areas with either 'sparse woody' or 'forest cover') in 2020 of only 8% in the projects in New South Wales and 4% in the projects in Queensland, compared to the woody cover levels in the quasi-control areas. To put this in context, at the time of the analysis, most of the projects in the sample had been credited on the basis they contained ~10-year-old regeneration across their entire credited areas, meaning the proportion of the area with forest cover should have been ~50%.

Despite the damning nature of the results, the Beare & Chambers report focused on the conclusion that the projects had a statistically significant effect, rather than the small effect size and the apparent absence of evidence of material regeneration. The Regulator and ERAC then misrepresented the results, claiming they showed the "projects demonstrably increased the amount of vegetation regenerating"[63] and that the projects were "exceeding expectations".[64]

The approach adopted by the Regulator and ERAC to the Fensham review and Beare & Chambers report became the boilerplate that the Government and relevant government agencies have followed ever since. Numerous government and government-commissioned reviews have subsequently been released that claim HIR projects are being administered appropriately and in accordance with the law and are performing as expected. As detailed in Macintosh et al (2026), the reviews that have been used for these purposes have either had manifest deficiencies in their logic and evidentiary basis or their findings have been misrepresented.[65]

Despite the failure to address the identified legal and integrity issues, HIR projects continued to be registered in uncleared rangelands areas through to the method's expiry in September 2023.[66] Between the time when the concerns were raised in late 2019 to when the method expired, 227 additional projects were registered, mostly in outback areas where there is no prospect of regenerating native forests (Figure A4). The Government's and industry's unsatisfactory responses to scientific criticisms, coupled with problems with the Regulator's administration of the method, has also ensured HIR projects have continued to receive millions of ACCUs. Between January 2020 and 30 June 2026, HIR projects were issued almost 44 million ACCUs, worth more than AU$1 billion.

[63] Emissions Reduction Assurance Committee (2022) Emissions Reduction Assurance Committee findings on the Emissions Reduction Fund's Human Induced Regeneration method. Commonwealth of Australia, Canberra, p 2. Available at: https://www.dcceew.gov.au/sites/default/files/documents/erac-findings-human-induced-regeneration-method.pdf (17 August 2026).

[64] Clean Energy Regulator (2022) CER response to claims by Professor Andrew MacIntosh. Commonwealth of Australia, Canberra. Available at: https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22media%2Fpressrel%2F8505308%22;src1=sm1 (20 August 2026).

[65] Macintosh, A., Butler, D., Evans, M.C., Henry, B. (2026) Shortcomings of Government and Government-commissioned Reviews into Human-Induced Regeneration (HIR) Projects. The Australian National University, Canberra.

[66] Australian Government (2026) Federal Register of Legislation – https://www.legislation.gov.au/F2013L01189/latest/text. Commonwealth of Australia, Canberra (12 August 2026).

Appendix B. Evolving defences of HIR projects

A key part of the Government's and carbon industry's response to the integrity issues raised about the illegality and underperformance of HIR projects has been to mount a series of unsustainable arguments to justify the continued crediting of the projects. This pattern started in 2021, when the Regulator claimed "typical" HIR projects are located on cleared land.[67] When this statement was proven to be untrue, the Regulator, ERAC and Department changed tack, arguing that research showing HIR projects were underperforming was unreliable because it was not peer reviewed and was based on analysis of trends in woody cover in the project areas rather than solely the credited areas.[68] The relevant research was based on project area data because, at the time, the credited area data were not published and proponents refused to release it. This policy changed after the Independent Review of ACCUs (Chubb Review), when legislative amendments were passed compelling the release of the credited area data from June 2023. Subsequent research showed the use of credited areas rather than project areas made little difference to the conclusion that the projects were not performing; there was still a marked absence of additional regeneration across the credited areas.[69] As the three peer-reviewed papers published by independent research teams since 2023 have demonstrated, having the research peer-reviewed also made no difference to the Regulator and Department's positioning.

After analysis using the newly released credited area data was published exposing the extent of underperformance, the Regulator and Department responded by publishing a statement in which they made two claims:

- that "[t]here is no requirement in the HIR method, nor other legislation, for projects to be preceded by land clearing"; and
- the "[s]cientific literature supports the view that grazing animals can stop trees reaching a forest, such as a study by Eldridge et al. (2016), which found that that overall 'ecosystem structure, function, and composition in rangelands are negatively affected by livestock grazing'".[70]

---

[67] Macintosh, A., Butler, D., Wilkinson, D. (2024) The great carbon offset scam. The Saturday Paper, 30 March. Available at: https://www.thesaturdaypaper.com.au/news/environment/2024/03/30/the-great-carbon-offset-scam (6 August 2026).

[68] Emissions Reduction Assurance Committee (2022) Emissions Reduction Assurance Committee findings on the Emissions Reduction Fund's Human Induced Regeneration method. Clean Energy Regulator, Canberra. Available at: https://www.dcceew.gov.au/sites/default/files/documents/erac-findings-human-induced-regeneration-method.pdf (3 August 2026); Chubb, I. (2023) Carbon Farming: let's get real and let's get on with it. Department of Climate Change, Energy, the Environment and Water, Canberra. Available at: https://www.dcceew.gov.au/sites/default/files/documents/prof-ian-chubb-2023-carbon-farming-statement.docx (3 August 2026).

[69] Macintosh, A., Butler, D., Evans, M. C., Waschka, M., Ansell, D. (2023) Summary Results of Analysis of the Integrity Risk and Performance of Human-induced Regeneration (HIR) Projects using CEA data, The Australian National University, Canberra. Available at: https://law.anu.edu.au/files/2024-01/Summary%20Results%20of%20Analysis%20of%20HIR%20CEA%20Data%20210623%20revised%20180723.pdf (6 August 2026).

[70] Clean Energy Regulator and Department of Climate Change, Energy, the Environment and Water (2023) Joint CER/DCCEEW response to ANU papers on Human Induced Regeneration. Commonwealth of Australia, Canberra. Available at: https://cer.gov.au/news-and-media/news/2023/june/joint-cerdcceew-response-to-anu-papers-human-induced-regeneration (3 August 2026). See also: Clean Energy Regulator (2022) Additional Literature – impacts of grazing animals on regenerating vegetation. Clean Energy Regulator, Canberra.

As detailed in section 4.1, the HIR method requires land included in the credited areas of HIR projects to support even-aged regeneration with forest potential, and for areas with mature trees and shrubs to be excluded. For land to satisfy these requirements, it will almost always need to have previously contained a native forest that was comprehensively cleared. This requirement is a central part of the underlying logic of the method and is reflected in the land eligibility requirements (see Table 2).

The Regulator, Department and ERAC have repeatedly claimed the HIR method does not require the land included in credited areas to have been previously cleared.[71] At best, this claim is misleading. The Regulator, Department and ERAC have also failed to explain how land containing mature trees and shrubs at commencement could satisfy the eligibility requirements for inclusion in credited areas.

The Regulator, Department and ERAC's position is that the HIR method allows land to be included in a credited area if it contains mature trees and shrubs so long as it does not have forest cover and could support additional regeneration that could lift tree crown cover above the forest threshold (20%), even if that is simply a temporary shift from, say, 18% to 21% cover.[72] This position cannot be reconciled with the method's eligibility rules or the approach to crediting, which is based on the biomass expected if an even-aged native forest grew from seedlings (Table 2). Contrary to the rules of statutory interpretation, it also results in irrational and absurd outcomes that conflict with the intent of the method and CFI Act.[73] For example, it allows for the inclusion of land in credited areas where canopy cover from pre-existing mature trees and shrubs on the land is just shy of 20% and the growth of a single additional tree or shrub would result in the land having forest cover. The area would then be credited on the basis that an even-aged forest had regenerated across the entire area, even though only one tree had been added. It is implausible that an interpretation that results in this type of outcome is that which "best achieves the purpose or object" of the method and the CFI Act (being the legal test that governs interpretation).[74]

The claims about the scientific literature supporting the "view that grazing animals can stop trees reaching a forest" are equally baseless. When the statement was published in June 2023, it prompted the lead author from the main cited article (Professor David Eldridge) to publicly

[71] Emissions Reduction Assurance Committee (2022) Emissions Reduction Assurance Committee findings on the Emissions Reduction Fund's Human Induced Regeneration method. Clean Energy Regulator, Canberra; Clean Energy Regulator (2024) Statement from the Clean Energy Regulator to ABC Future Tense. Australian Broadcasting Corporation, Sydney. Available at: https://www.abc.net.au/listen/programs/futuretense/cities-that-create-rain-ai-warfare-carbon-offset/104453540 (3 August 2026); Clean Energy Regulator (2024) Regulator's response to ANU/UNSW research – statement to news.com.au. Clean Energy Regulator, Canberra; Clean Energy Regulator and Department of Climate Change, Energy, the Environment and Water (2023) Joint CER/DCCEEW response to ANU papers on Human Induced Regeneration. Commonwealth of Australia, Canberra. Available at: https://cer.gov.au/news-and-media/news/2023/june/joint-cerdcceew-response-to-anu-papers-human-induced-regeneration (3 August 2026).

[72] Clean Energy Regulator (2024) Human-induced regeneration method – Managing project risk to deliver carbon abatement for Australia. Commonwealth of Australia, Canberra; Emissions Reduction Assurance Committee (2022) Emissions Reduction Assurance Committee findings on the Emissions Reduction Fund's Human Induced Regeneration method. Clean Energy Regulator, Canberra.

[73] *Acts Interpretation Act 1901* (Cth), s 15AA; *Legislation Act 2003* (Cth), s 13; Cooper Brookes (Wollongong) Pty Ltd v Federal Commissioner of Taxation [1981] HCA 26, per Mason and Wilson JJ at [25].

[74] *Acts Interpretation Act 1901* (Cth), s 15AA; *Legislation Act 2003* (Cth), s 13; Project Blue Sky v ABA [1998] HCA 28.

rebuke the Regulator for misrepresenting his research.[75] It also led him to publish a subsequent article with a colleague in *Science* reiterating that the scientific literature does not support the assertion that reducing grazing in uncleared rangelands increases woody biomass.[76]

Since making the joint statement, the Department has conducted two internal reviews of the science on the impact of grazing on woody vegetation in uncleared rangeland areas. Both reviews have confirmed that the science does not support the contention that grazing has a material negative impact on woody vegetation cover in uncleared rangelands. Neither of these reviews have been made public. Further support for the view that the science does not support the contention that grazing has a material negative impact on woody vegetation cover is found in the CSIRO's draft submission to the Chubb Review, which stated:

> ... there is at present no clear evidence that changes in management of total grazing pressure will consistently result in an increase in carbon stocks in woody biomass across all regions of Australia's rangelands.[77]

However, the CSIRO submission was modified to remove this material following intervention by the Regulator.[78]

Later research by CSIRO commissioned by the Department confirmed that grazing generally has limited impacts on tree and shrub cover in uncleared rangeland areas.[79] The study compared carbon stocks in woody biomass in exclosures (fenced areas where grazing animals were largely or fully excluded) and control sites grazed by livestock and native animals and found no statistically significant difference between the two. The result is particularly noteworthy because it involved exclosures; an extreme form of grazing control that in no way reflects what occurs in HIR projects. The replication of this type of grazing control is not possible across rangeland areas, other than small patches of land where fencing can be used to achieve the effect.

Faced with these inconvenient truths, and yet still wanting to defend HIR projects on uncleared lands, from November 2021 until the present, the Regulator and ERAC have claimed the Beare & Chambers report shows HIR projects are performing as expected. Notably, the Beare & Chambers report was relied on by the ERAC in its report of 2022, where it categorically rejected claims about the HIR method not satisfying the offsets integrity standards and the underperformance of projects.

In March 2024, the use of the results in the Beare & Chambers report to support Government, ERAC and industry's claims that HIR projects were performing as expected was discredited by

---

[75] Eldridge, D. (2023) Statement by Professor David Eldridge on misuse of research: July 2023. Vimeo. Available at: https://vimeo.com/847854818?share=copy&fl=cl&fe=ci (3 August 2026).
[76] Eldridge, D.J., Sala, O. (2023) Australia's carbon plan disregards evidence. *Science* 382, 894.
[77] CSIRO, FOI 2023/3, Part 5, p 58. This is consistent with the findings from a modelling study on northern rangelands by the CSIRO that was commissioned by the Department in 2011. See Cook, G.D. et al. (2011) Towards a CFI methodology for carbon sequestration in Australian rangelands: effects of fire and grazing in the north. Report for the Department of Climate Change and Energy Efficiency. CSIRO, Winnellie, Northern Territory.
[78] Grieve, C., Bachelard, M. (2024) 'Entirely inappropriate': Top scientist slams watchdog interference in carbon review. The Age, 23 September. Available at: https://www.theage.com.au/environment/climate-change/entirely-inappropriate-top-scientist-slams-watchdog-interference-in-carbon-review-20240919-p5kbu2.html (20 February 2025).
[79] Forrester, D. et al. (2025) Does grazing exclusion in Australia's rangelands affect biomass and debris carbon stocks? The Rangeland Journal 47, RJ24028.

the study by Macintosh, Butler et al. (2024) that was published in the Nature-stable journal *Communications Earth and Environment*.[80] The study analysed 182 HIR projects with the same government dataset used by Beare & Chambers (NFSW, only version 7) and found limited evidence of regeneration in credited areas. It also found that the observed changes in forest and sparse woody cover in the credited areas largely mirrored changes in cover on adjacent lands (called "comparison areas"), outside the projects. The fact that forest and sparse woody cover in the credited areas and comparison areas were moving together suggests the observable changes in the credited areas were predominantly attributable to factors other than the project activities (i.e. rainfall). As discussed above, while Macintosh, Butler et al. (2024) found that, at the aggregate level, HIR projects had had a statistically significant effect on forest and sparse woody cover, the effect size was small. The observed increases in cover were also small in both absolute terms and relative to the expected changes based on the number of ACCUs issued to the projects.

Confronted with the results from Macintosh, Butler et al. (2024), the Regulator and Department responded by claiming that analysis they had commissioned from ANU Enterprises, undertaken by Dr Cris Brack, provided confidence projects were performing as expected and being administered appropriately. Since 2023, Brack has been reviewing the Regulator's administration of its gateway rules for the Regulator. Brack's first report, completed in December 2023, analysed 25 HIR projects against the gateway rules.[81] For these purposes, he relied primarily on the Woody Cover Fraction (WCF) database, a national database derived from Landsat data, with a 25m x 25m resolution, which monitors changes in foliage projective cover (FPC) (i.e. proportion of ground area covered by the vertical projection of the foliage of tree crowns) from woody vegetation ≥2 metres in height across the continent.[82] Based on analysis of WCF data, Brack (2023) found that "the [credited areas] appear to be regenerating well in the project areas, especially since 2020 and on average are significantly (p=0.05) above the 7.5% canopy cover threshold".[83] Drawing on these findings, and his review of the data and processes relied on by the Regulator to assess and ensure compliance, Brack (2023) concluded:

> The independent audit reports and the [Regulator] reviews provide strong assurance that projects are being managed as per the legislative requirements and that appropriate methods have been used by the proponents or their agents in classifying the [carbon estimation areas] and identifying changes in regeneration canopy cover.[84]

---

[80] Macintosh, A., Butler, D. et al. (2024) Australian human-induced native forest regeneration carbon offset projects have limited impact on changes in woody vegetation cover and carbon removals. Communications Earth & Environment 5, 149.

[81] Brack, C. (2023) Gateway Regeneration Checks for Human Induced Regeneration projects. Phase 2. Clean Energy Regulator, Canberra. Available at: https://cer.gov.au/document/gateway-regeneration-checks-human-induced-regeneration-projects (3 August 2026).

[82] Liao, Z. et al. (2020) Woody vegetation cover, height and biomass at 25-m resolution across Australia derived from multiple site, airborne and satellite observations. International Journal of Applied Earth Observation and Geoinformation 93, 102209.

[83] Brack, C. (2023) Gateway Regeneration Checks for Human Induced Regeneration projects. Phase 2. Clean Energy Regulator, Canberra, p 9. Available at: https://cer.gov.au/document/gateway-regeneration-checks-human-induced-regeneration-projects (3 August 2026).

[84] Brack, C. (2023) Gateway Regeneration Checks for Human Induced Regeneration projects. Phase 2. Clean Energy Regulator, Canberra, p 11. Available at: https://cer.gov.au/document/gateway-regeneration-checks-human-induced-regeneration-projects (3 August 2026).

A material flaw in Brack's (2023) analysis was that it did not apply the correct gateway rules. Rather than verifying compliance with the regulatory requirements, Brack (2023) applied a different set of requirements that have no basis in the law or the Regulator's policy guidance on the method. He also incorrectly used WCF as a measure of canopy cover, when it provides estimates of foliage projective cover (FPC), and focused on whether the credited areas had ≥7.5% canopy cover, not whether there had been an increase in canopy cover in the credited areas. When Macintosh, Evans et al. (2024) analysed 116 projects against the actual gateway rules using the WCF dataset, contrary to what Brack (2023) concluded, they found extremely high levels of non-compliance. As before, they also found that the projects had a statistically significant effect on woody cover but that the observed changes paled in comparison to the credits issued.[85]

With its NFSW and WCF defences discredited, the Regulator and carbon industry changed direction again. This time it claimed that "all national scale" datasets of woody cover —NFSW, WCF and TERN Persistent Green—are ill-suited for use in analysing HIR projects and that the only reliable way of analysing project performance is using field and higher resolution remote sensed data.[86]

Since August 2024, the Government and Regulator have based this argument on gateway check reports prepared by Brack (2024a, 2024b, 2025a, 2025b, 2026).[87] After relying primarily on WCF in 2023, in his later reports, Brack has contended that all Landsat-based national scale models are imprecise, inconsistent, biased and tend to significantly underestimated canopy cover of the sparsely wooded areas.[88] Brack also claims high-resolution imagery from ESRI Wayback (an online digital tool) is used to check that regeneration is occurring in accordance with the Regulator's gateway rules and that, in the majority of cases he analysed, the Wayback imagery "provided evidence of positive regeneration".[89] His findings in these reports have been that:

- the national-scale datasets are unreliable;

[85] Macintosh, A., Evans, M.C. et al. (2024) Non-compliance and under-performance in Australian human-induced regeneration projects. The Rangeland Journal 46, RJ24024.
[86] Moore, T. et al. (2025) National-scale datasets underestimate vegetation recovery in Australian human-induced native forest regeneration carbon sequestration projects. Communications Earth & Environment 6, 802. For reply, see: Macintosh, A., Evans, M.C. et al. (2025) Reply to: National-scale datasets underestimate vegetation recovery in Australian human-induced native forest regeneration carbon sequestration projects. Communications Earth & Environment 6, 803.
[87] Brack, C. (2024a) Gateway Regeneration Checks for Human Induced Regeneration projects (2024/1). ANUE Project #1-1035 (Phase 3). Clean Energy Regulator, Canberra; Brack, C. (2024b) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 3 part 2 for 2024). Clean Energy Regulator, Canberra; Brack, C. (2025a) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 4 part 1 for 2025). Clean Energy Regulator, Canberra; Brack, C. (2025b) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 5). Clean Energy Regulator, Canberra; Brack, C. (2026) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 5). Clean Energy Regulator, Canberra. All available at: https://cer.gov.au/schemes/australian-carbon-credit-unit-scheme/managing-risk-and-integrity-accu-scheme#independent-reviews-of-the-accu-scheme (26 August 2026).
[88] Brack, C. (2026) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 5). Clean Energy Regulator, Canberra, pp 6-10.
[89] Brack, C. (2025a) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 4 part 1 for 2025). Clean Energy Regulator, Canberra, p 12. See also Brack, C. (2024a) Gateway Regeneration Checks for Human Induced Regeneration projects (2024/1). ANUE Project #1-1035 (Phase 3). Clean Energy Regulator, Canberra, p 9; Brack, C. (2024b) Gateway Regeneration Checks for Human Induced Regeneration projects. ANUE Project #1-1035 (Phase 3 part 2 for 2024). Clean Energy Regulator, Canberra, p 7.

- proponents and their agents are using "improved precision satellite data (e.g. Sentinel-2 at 10 m or SPOT at 1 m), field-based measurements and georeferenced photographs to demonstrate attainment of forest cover thresholds";
- the methods used by proponents are appropriate and that "[o]n average, stratification by proponents or their agents into CEA that are regenerating is reliable with an acceptable accuracy rate and accords with good practice"; and
- the Regulator's processes "provide strong assurance that projects are being managed as per the HIR requirements".

Despite the positive nature of his findings, neither the Regulator nor Dr Brack have been willing to publish the details of the projects that have been analysed, the sites that have been assessed or the methods and data used by proponents and their agents to assess tree cover. There remains incongruity between Dr Brack's reports and the science on grazing impacts and the performance of HIR projects, and a lack of transparency surrounding his reviews and the Regulator's processes.

The dramatic change in the Regulator's and Brack's opinion on the reliability of the NFSW and WCF datasets is also noteworthy. Only 8 months prior to the release of his August 2024 report, Brack and the Regulator had argued analysis based on WCF showed HIR projects were regenerating well. Before that, the Regulator, Department and ERAC had claimed Beare & Chambers (2021), which relied on NFSW, showed the projects were performing in line with expectations.[90] This new position—that all national scale woody cover datasets are ill-suited for use in analysing HIR projects—implied that Brack (2023), Beare & Chambers (2021) and the 2022 ERAC report that defended HIR projects were flawed, as they too relied on the same datasets. Despite this inconsistency, Regulator and Department have continued to reference all three reports in trying to fend off questions about the performance of HIR projects.[91] Most recently they appear to be claiming that grazing has removed millions of hectares of forest from Australia's interior, by a process they refer to as "passive clearing", which goes completely against historically informed understanding of the history of Australia's rangelands (see Appendix A).

Appendix C. Method used to analyse forest regeneration in HIR projects

C1. Project sample

The project sample was selected based on ACCU issuances and resultant expected crown cover increase from new regeneration up to 2025. The expected crown cover increase from new regeneration was calculated using a four-step method:

(a) ACCUs issued to the end of 2025 were converted into total credited sequestration by multiplying the ACCUs issued by 1.33 (for projects with 25-year permanence periods) or 1.05 (for with 100-year permanence periods);[92]

(b) total credited sequestration from (a) was converted into credited sequestration per hectare by dividing it by the credited area of the relevant project (in hectares), calculated from spatial data published by the Regulator defining each project's credit area extent;[93]

(c) credited sequestration per hectare was converted into live biomass equivalent using representative Full Carbon Accounting Model (FullCAM) plots from project areas (i.e. to exclude debris); and

(d) expected crown cover increase was derived using the credited live biomass per hectare estimate from (c) and the live biomass to crown cover relationship from Larmour et al. (2018) (expected cover gains were capped at 40% to reflect the bounds of the relationship established by Larmour et al. (2018)).[94]

To facilitate analysis of the impacts of the projects, 2000 x 10 ha 'comparison area' cells were randomly selected from a 3km buffer around the projects, excluding areas included in other projects. Trends in forest and woody crown cover in the credited areas and comparison areas were then analysed to determine the impacts of the project activities. Due to the use of this method, projects that were surrounded by other projects were excluded from the sample. Projects were also excluded if there was no published credited area data for the project or the published data were corrupted.

The 52 projects with the highest expected crown cover increase from new regeneration to the end of 2025 were then selected.[95] Of these:

(a) one project (ERF101849) was excluded because it experienced a substantial reduction in its credited area in 2025-26, which inflated its credited sequestration per hectare; and

---

[92] These adjustment factors account for the permanence period discount (20%, only applied to projects with 25-year permanence periods) and risk of reversal buffer discount (5%, applied to all sequestration projects). *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), s 16.

[93] Calculated using the credited area data published in July 2026. Clean Energy Regulator (2026) ACCU scheme project register. Commonwealth of Australia, Canberra. Data as at 30 June 2026. Available at: https://cer.gov.au/markets/reports-and-data/accu-project-and-contract-register (30 July 2026).

[94] 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. Available at: https://storage.googleapis.com/converlens-au-industry/industry/p/prj1a47ed442d5708f8dd669/public_assets/csiro-final-report-stand-biomass-and-canopy-cover.pdf (3 August 2026).

[95] The sample was limited to ~50 projects due to the cost of acquiring high-resolution imagery.

(b) one project (ERF121619) was excluded because suitable historic very high-resolution imagery for its credited area was not available.

Details of the 50 projects in the sample are provided in Table C1 below.

C2. Assessment of forest regeneration

Forest regeneration in the credited areas of the 50 projects was evaluated using three approaches.

(a) Forest cover was assessed using the Vegetation Monitoring & Assessment Program (VMAP) Forest Extent dataset. This dataset defines the extent of forests across the continent in 2020 through to 2025 using both the Australian (areas ≥0.2 ha with trees ≥2m in height that provide crown cover of ≥20%) and Food and Agricultural Organization (FAO) definitions (areas ≥0.5 ha with trees ≥5m in height that provide crown cover of ≥10%) of forest. Details on the dataset and its accuracy are provided in Larraondo et al. (2026a).[96] Using the Australian forest definition, forest extent in the credited areas and comparison areas was analysed in 2020 and 2025. Based on issued ACCUs, by 2025, all of the projects in the sample should have had 100% forest cover across their credited areas from new regeneration alone (i.e. even if any pre-existing cover from the crowns of mature trees and shrubs was excluded).

(b) Changes in crown cover from 2017 to 2025 (Sentinel-2 imagery became available in late 2016) were assessed in the credited areas and their comparison areas using the VMAP Woody Cover dataset. VMAP Woody Cover estimates crown cover from woody vegetation ≥2 metres tall in each cell of a 10m x 10m grid across the continent. Crown cover refers to the proportion of ground area covered by the vertical projection of tree crowns. Details on the VMAP Woody Cover dataset and its accuracy are provided in Larraondo et al. (2026b).[97] The purpose of this analysis was to assess: (i) whether crown cover has increased since 2017; (ii) whether any observed increase is commensurate with the expected increase in crown cover based on credited sequestration; and (iii) whether and the extent to which the projects have increased crown cover beyond changes seen on nearby lands that have not been subject to the project activities. To facilitate a comparison between observed and expected crown cover, it was necessary to adjust the expected cover estimates to account for the crown cover provided by woody vegetation in the credited areas at commencement. This adjustment was done in two ways: adding expected crown cover based on total project ACCU issuances to 31 December 2025 to an estimate of crown cover derived from Woody Cover Fraction at project commencement (first year of each project's crediting period);[98] and adding

[96] Larraondo, P.R. et al. (2026a) VMAP: a continental time series of forest extent, loss and gain for Australia based on Sentinel-2. The Australian National University, Canberra.
[97] Larraondo, P.R. et al. (2026b) VMAP: a continental time series of tree crown cover for Australia based on Sentinel-2. The Australian National University, Canberra.
[98] For details of Woody Cover Fraction, see Liao, Z. et al. (2020) Woody vegetation cover, height and biomass at 25-m resolution across Australia derived from multiple site, airborne and satellite observations. International Journal of Applied Earth Observation and Geoinformation 93, 102209. Woody Cover Fraction estimates were converted to crown projective cover using the relationship in Fisher, A. et al. (2018) Relating foliage and crown projective cover in Australian tree stands. Agricultural and Forest Meteorology 259, 39-47. The same method was used in Macintosh, A., Evans, M.C. et al. (2024) Non-compliance and under-performance in Australian human-induced regeneration projects. The Rangeland Journal 46, RJ24024.

expected crown cover commensurate with the biomass gains required to justify project ACCU issuances from 1 July 2017 to 31 December 2025 to the 2017 VMAP Woody Cover estimate. This approach provided a range within which crown cover should have been in 2025 if regeneration was occurring in line with credited sequestration – noting that the comparison to expected cover makes no assumptions about the extent to which any observed gains in crown cover are attributable to the project and go beyond what would have happened anyway.

(c) Very high-resolution imagery (30-50cm, with one image at 80cm) was obtained from Vantor via Terrabit and the European Space Agency (ESA) for one 2,500 ha area of interest within each of the 50 projects. The areas of interest were located to maximise the credited area in the acquired image. Two images were obtained for each area of interest: one from around the time the project claimed to have commenced and the most recent image available for the area. The images of the areas of interest were processed, orthorectified and then divided into 230 x 10.9 ha cells. The 60 cells with the highest proportion of credited area were selected for assessment. The non-credited areas within each of the 60 cells were shaded out to confine the visual assessment to the credited areas. The two images (project commencement and recent) of the credited areas in each of the 60 cells was then visually assessed by two separate research groups (2 researchers in Research Group 1[99] and 3 researchers in Research Group 2)[100] to determine whether there was evidence of regeneration using the Likert-scale presented in Table 3. The researchers in Research Group 1 knew the names and details of the projects, the location of the cells, the date the imagery was captured and the context of the assessment. The researchers in Research Group 2 had no context about the nature and purpose of the visual assessment and no details of the cells or the date of the imagery. They were provided access only to the imagery and conducted a blind assessment of the difference in crown cover between the images without additional context.

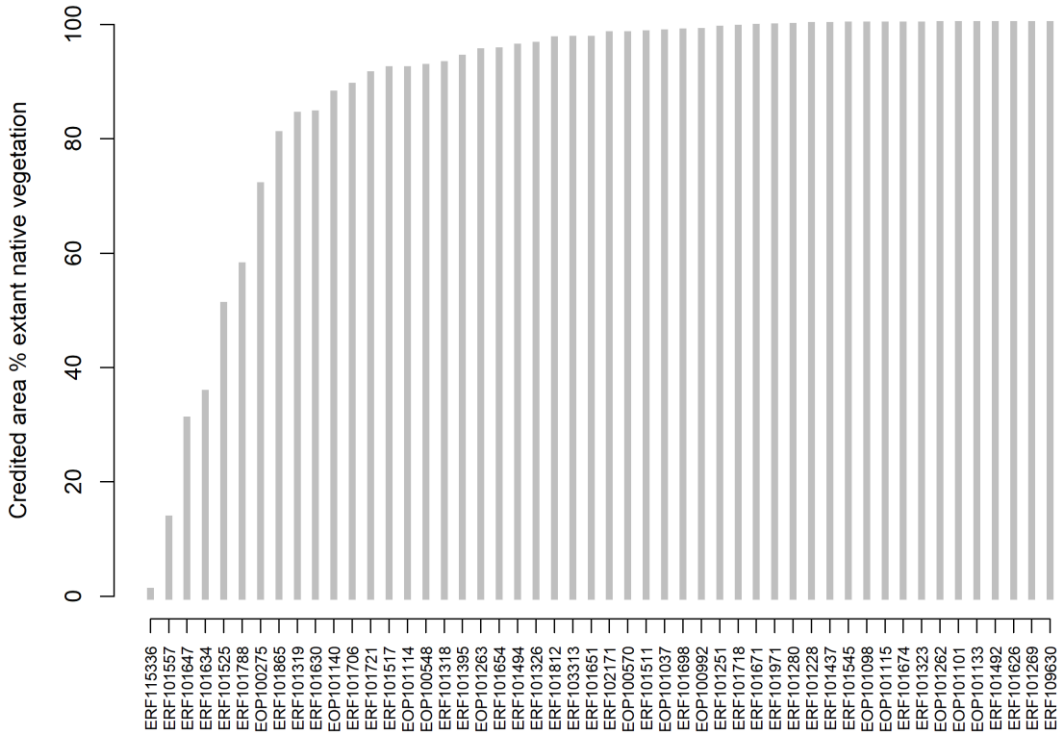
As detailed in section 4, the science suggests that the performance of HIR projects in regenerating native forests should improve as the proportion of credited areas mapped as extant native vegetation decreases (i.e. the proportion comprehensively cleared increases) (and *vice versa*). To assess this hypothesis, the sample was divided into four groups based on the proportion of credited area mapped as extant native vegetation (see section 5.1).

For these purposes, areas mapped as extant native vegetation were those that qualify as remnant vegetation, being native vegetation that has either never been comprehensively cleared, or that has been cleared and regrown, that retains the general structure and composition of the native ecosystem. The mapping of extant native vegetation in the credited areas was done using one of two datasets. For projects located in Queensland and South Australia, we used a national 100 m grid of extant major vegetation groups from the National Vegetation Information System.[101] Grid cells assigned to Major Vegetation Group 25 (cleared) or

[99] Authors 1 and 2 of this report.
[100] All three researchers were from Australia Spatial Analytics Ltd, who were contracted by The Australian National University to undertake the assessment.
[101] Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) National Vegetation Information System, version 6. NVIS6_0_AUST_EXT. Commonwealth of Australia, Canberra.

29 (regrowth) were deemed to be comprehensively cleared land. For projects in New South Wales, we used the NSW Statewide Vegetation Type data, generalised from a 5 m to a 100 m grid.[102] We deemed cells not classified as a native Plant Community Type or classified as one of several native Plant Community Types derived by clearing, to be previously comprehensively cleared.[103] The percentage of the credited areas of the projects in the sample that were mapped as extant native vegetation is shown in Figure C1, ranked from lowest to highest.

Figure C1. Percentage of credited areas of sampled projects mapped as extant native vegetation



Sources: Clean Energy Regulator (2026) ACCU scheme project register. Commonwealth of Australia, Canberra. Data as at 30 June 2026. Available at: https://cer.gov.au/markets/reports-and-data/accu-project-and-contract-register (30 July 2026); Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023) National Vegetation Information System, version 6. NVIS6_0_AUST_EXT. Commonwealth of Australia, Canberra; NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2020) NSW State Vegetation Type Map – SVTM. NSW Government, Sydney. Available at: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map (10 August 2026).

[102] NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2020) NSW State Vegetation Type Map – SVTM. NSW Government, Sydney. Available at: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map (10 August 2026).

[103] For the more detailed assessment of cleared vs uncleared areas in the 13 projects, we used the same sources but in vector format. For SA and Qld, we defined cleared areas using polygons assigned to MVG 25 or 29 from NVIS. For NSW we assigned areas not classified as native vegetation, or classified as a 'derived' PCT, as previously comprehensively cleared and used the polygon boundaries rather than the more generalised 100m grid employed for the wider analysis.

Table C1. Details of projects in sample – crediting period start year, credited area, ACCUs, credited sequestration, expected canopy cover from new regeneration

Project ID	Project name	Crediting period start date	Modelled years of regeneration*	Credited area	ACCUs to end 2025	Credited sequestration*	Expected canopy cover from new regeneration*	Credited area extant native vegetation
Units		**Date**	**Years**	**Hectares**	**No.**	**tC per ha**	**%**	**%**
ERF101557	Urana Regeneration Project	30/06/2012	16	9,631	357,351	13.49	40%	13%
EOP100275	Arbon - Tooligie - Human Induced Regeneration	1/01/2013	9-16	3,394	186,452	15.77	40%	72%
ERF101718	Corrie Downs Regeneration Project	1/01/2011	19	2,694	95,406	12.88	40%	99%
ERF101228	Poon Boon Regeneration Project	1/01/2011	18	8,081	267,162	12.02	40%	100%
EOP100570	Kinchela Regeneration Project	13/12/2014	19	9,426	380,220	11.58	40%	98%
ERF101251	Congararra Regeneration Project	1/01/2011	19	8,761	277,880	11.53	40%	99%
EOP100992	Galambo Regeneration Project	1/07/2010	19	4,072	169,278	11.93	40%	99%
ERF101525	Ularunda Regeneration Project	30/06/2012	16	7,045	228,758	11.81	40%	51%
ERF101323	Tambua Regeneration Project	1/01/2012	18	11,487	378,440	11.98	40%	100%
EOP101263	Buckambool Human-Induced Regeneration Project	1/01/2012	16	8,752	338,522	11.10	40%	95%
ERF101647	Aqua Downs Station Regeneration Project	1/01/2012	16	7,367	225,808	11.15	40%	31%
EOP101098	Mullagalah Regeneration Project	1/01/2013	19	8,138	319,712	11.28	40%	100%
ERF101812	Longdowns Regeneration Project	1/07/2012	17	6,950	227,399	11.90	40%	97%
EOP101115	Byrock Station Regrowth Project	1/07/2010	15	5,147	201,347	11.23	40%	100%
ERF115336	Catchment Conservation Alliance - Great Barrier Reef Initiative Site #3	18/07/2017	16	2,351	95,306	14.74	40%	1%
ERF101517	Wapweelah Regeneration Project	23/03/2012	16	18,669	553,727	10.79	39%	92%
ERF101651	Yarrawonga Cobar Regeneration Project	1/01/2011	16	5,518	161,562	10.65	39%	97%
EOP101037	Lindermans Regeneration Project	1/01/2013	19	2,466	88,542	10.31	38%	99%
ERF101721	Kenilworth Regrowth Project	1/07/2011	15-17	22,741	826,695	10.44	38%	91%
ERF101511	Jandra/Nulty Regeneration Project	23/03/2012	17	24,609	684,678	10.12	37%	98%
ERF101698	Darling River Eco Corridor 16	1/01/2013	14	3,620	126,543	10.04	37%	99%

EOP101101	Mulgaroon Forest Regeneration Project	1/01/2013	17	8,859	307,077	9.95	37%	100%
ERF101971	Cougar Regeneration Project	1/10/2015	15	2,749	92,789	9.69	37%	100%
ERF101865	Joonderee and Elmina Regeneration Project	31/03/2011	17	10,309	282,874	9.98	37%	81%
ERF101395	Morton Plains Human-Induced Regeneration Project	1/01/2013	17	11,158	375,072	9.65	36%	94%
ERF101492	Inverness Human-Induced Regeneration Project	1/01/2012	11-18	9,652	323,955	9.64	36%	100%
EOP100548	Runnymede Regeneration Project	1/07/2010	15	1,718	57,951	9.68	36%	93%
EOP101114	Bora Regeneration Project	1/07/2010	16-17	5,319	174,020	9.39	35%	92%
EOP101140	El Trune Regrowth Project	1/07/2012	14	2,535	80,431	9.11	35%	88%
ERF101437	Stanbert Regeneration Project	1/01/2012	16	6,021	151,515	9.15	35%	100%
ERF102171	Woodstock Regeneration Project	1/10/2015	14	4,323	133,517	8.87	35%	98%
ERF101671	North West Regeneration Project	1/01/2012	16	7,756	192,302	9.02	34%	100%
ERF101626	Curragh Regeneration Project	1/01/2014	15	9,477	291,483	8.83	34%	100%
ERF101319	Kaleno Human-Induced Regeneration Project	1/01/2012	18	10,800	333,721	8.87	34%	84%
ERF101280	Lynwood Human-Induced Regeneration Project	1/01/2012	18	24,379	750,161	8.83	34%	100%
ERF101630	Gambolalley Regeneration Project	1/01/2012	16	4,166	98,583	8.61	33%	84%
ERF101788	Mayfield Regeneration Project	1/01/2012	18	4,384	103,651	8.60	33%	58%
ERF101326	Wancobra Regeneration Project	1/01/2012	17	6,576	153,679	8.50	33%	96%
ERF101634	Wongalee Mervyndale and Rundalua Forest Regeneration Project	30/06/2012	16	20,640	479,839	8.45	33%	35%
ERF101654	Richmond Regeneration Project	1/01/2011	17	2,382	70,343	8.48	33%	95%
ERF101545	Glengeera Forest Regeneration Project	1/07/2011	16	9,596	221,319	8.39	32%	100%
ERF101674	Boonora Downs Human-Induced Regeneration Project	1/01/2012	16	7,717	212,685	7.91	31%	100%
ERF109630	Mullagalah II Regeneration Project	23/03/2017	16	2,684	68,837	7.36	30%	100%
ERF101706	Warana Regeneration Project	1/01/2012	16	9,399	197,249	7.63	30%	89%
ERF103313	Darling River Eco Corridor 7	14/04/2016	14	10,287	264,964	7.39	30%	97%
EOP101262	Myroolia Human-Induced Regeneration Project	1/01/2012	18	17,276	449,530	7.47	30%	100%

EOP101133	Delta Regeneration Project	1/01/2013	18	13,300	342,490	7.39	30%	100%
ERF101494	Berangabah Human-Induced Regeneration Project	1/01/2012	18	14,550	374,367	7.39	29%	96%
ERF101269	Curranyalpa Human-Induced Regeneration Project	1/01/2012	18	9,530	244,781	7.37	29%	100%
ERF101318	Clovelly Regeneration Project	30/06/2012	16	9,506	191,208	7.31	29%	93%

* Modelled years of regeneration, credited sequestration and expected canopy cover from new regeneration calculated to or as at 31 December 2025. For projects with more than one model regeneration start date, the modelled years of regeneration was calculated based on the earliest and latest published model regeneration start dates.
Source: Clean Energy Regulator (2026) ACCU scheme project register. Commonwealth of Australia, Canberra. Data as at 30 June 2026. Available at: https://cer.gov.au/markets/reports-and-data/accu-project-and-contract-register (30 July 2026).