



Avoided Deforestation Q&A



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Introduction to Avoided Deforestation

What do forests have to do with greenhouse gas emissions?

Forests are one of Australia's largest carbon sinks.

The removal of carbon from the atmosphere to be stored in carbon sinks such as vegetation is called carbon sequestration. It is one activity that mitigates the effects of climate change by reducing Australia's greenhouse gas emissions. Increasing vegetation therefore increases removal of carbon from the atmosphere and increases carbon stores.

Another activity that mitigates climate change is avoiding vegetation loss - for example, by not clearing an area that was going to be cleared for cropping or grazing. This prevents carbon emissions stored in the protected vegetation from entering the atmosphere. Both the sequestration of carbon by increasing vegetation, and the avoidance of carbon loss by protecting vegetation from clearing, result in a net reduction of greenhouse gas in the atmosphere.

The proven success or effectiveness of maintaining or increasing vegetation to generate carbon abatement is dependent upon the manner and extent to which these vegetation carbon stores can be measured, which is in turn reliant on the integrity of the method used to abate carbon from the atmosphere.

In Australia, there are a number of activities that the Clean Energy Regulator (CER) accepts as being eligible - or approved - methods for generating carbon credits under the Emissions Reduction Fund (ERF). These either sequester atmospheric carbon in vegetation and soils or avoid the release of carbon into the atmosphere by maintaining (preserving) vegetation and soil carbon stores. The credits generated by these activities contribute to a reduction in Australia's greenhouse gas emissions.

Why is it important to protect forests to mitigate climate change?

Land clearing is the leading cause of deforestation and is a major contributing factor to climate change, along with having significant other environmental, social and economic impacts (Metcalf & Bui 2016). Deforestation:

- releases greenhouse gases into the atmosphere by destroying vegetation that acts as a natural carbon sink;
- destroys and fragments habitat, which in turn threatens biodiversity, leading to loss of wildlife and a rapid acceleration of extinction rates;
- accelerates erosion, leading to increasing pollution of waterways and the marine environment;
- compromises the ecosystem services provided by intact vegetation, resulting in increasing dryland salinity and the frequency and severity of droughts; and
- threatens indigenous connection to country, placing traditional knowledge and heritage at risk.

Land clearing continues to be a significant driver of environmental degradation, carbon emissions, and biodiversity loss in Australia. Australia has lost 40-50% of its forests since European colonisation (Bradshaw 2012; TWS 2017). Today, it is the only OECD country in the world's top 10 land clearing nations (Preece & van Oosterzee 2017).

In New South Wales (NSW), the recent average clearing rate of woody vegetation is approximately 35,000 ha per annum while the rate of non-woody vegetation is approximately 50,000 ha per annum (NSW SoE 2021). These figures don't include clearing of non-woody vegetation on unregulated land. Agricultural clearing has increased threefold over the last decade in NSW (NSW SoE 2021).

In Queensland (Qld), the Statewide Landcover and Trees Study (Qld SLATS 2018-2019) showed that 680,688 hectares of woody vegetation was cleared from 2018-2019. Of this, 82% of the clearing activity resulted in full removal of woody vegetation, while 15% was defined as partial major clearing which left between 10 and 50% of the area with crown cover. The report estimated that 84% of land cleared in this period destroyed vegetation that was at least 15 years old. Even worse,

three per cent of clearing took place in areas [of concern](#) and one per cent in endangered regional ecosystems. The great bulk of the deforestation, or 88%, involved land with less than 50% tree cover. (Qld SLATS 2018-2019).

It is most important to consider that all of this clearing is on track to contribute up to 50 million tonnes of emissions per year, according to the federal government's emissions projections (Aust Govt DISER 2020).

Furthermore, the habitat fragmentation caused by land clearing continues to have long-term ecological impacts well after the initial clearing occurs, including (NSW SoE 2021):

- the dieback of vegetation and lack of regeneration;
- invasion by weeds and feral animals; and
- loss of native species and variability.

How do we track land clearing?

Land clearing is tracked to help understand where it is taking place, the impact it is having, and what measures can be taken to control it - for example, by undertaking carbon projects.

To do so, analysts look at remote sensing data and imagery collected by satellites, such as LandSat and Sentinel, to detect changes in vegetation cover over time.

Tracking land clearing, however, faces a number of challenges. These include the number of different ways that land clearing can be defined, as well as the ongoing changes in the methods used to detect clearing as technology has evolved. There are also difficulties with tracking small changes in vegetation between seasons, drought and high rainfall periods.

Also, not all land clearing leads to deforestation. To be defined as a deforestation event, land clearing must occur on an area of at least 0.2ha where vegetation loss leads to a decrease from greater than 20% canopy extent to less than 20% canopy extent. For example, a clearing event where vegetation with a canopy extent of 21% is cleared, resulting in a canopy extent of 19%, would be classified as a deforestation event as long as the area impacted is at least 0.2ha. In contrast, the clearing of vegetation that results in a loss of canopy, from 50% cover to 25% cover, would not be classified as deforestation, even though 25% of the vegetation was destroyed.

The National Carbon Accounting System (NCAS) and the Statewide Landcover and Trees Study (SLATS) are the two main approaches for tracking land clearing. However, not all data sets that report land clearing are consistent. For example, NCAS only identifies clearing that leads to deforestation, while SLATS identifies total clearing and partial events, not all of which lead to deforestation. In addition, while the resolution of the innovative satellite and remote sensing technologies these approaches employ has improved over time, it has not necessarily made it easier to gain insights into historical clearing rates.

What is the tracking telling us about what is happening in NSW?

In NSW, today, land clearing is tracked through SLATS. It tracks the annualised woody vegetation change rates for the 2017, 2018 and 2019 periods, and into the future, using Sentinel-2 imagery which uses 10m pixels. The figures for the 2015 and 2016 periods are based on analysis between SPOT-5, SPOT-6 and Sentinel-2 imagery. Previously reported periods between 1988 and 2014, however, are based on SPOT-5 and Landsat imagery that used lower resolution data (25m pixels) (NSW DPIE 2021). NCAS also is tracking change in NSW, but only deforestation using Landsat imagery with 25m pixels.

Like-for-like comparisons are therefore difficult to make as the satellite resolution alone will yield different results. This is particularly challenging when attempting comparative studies of pre-2009 clearing rates, for which only lower resolution imagery is available.

What we do know, however, from the above tracking data is that recent clearing rates in NSW have been the highest in decades. This is particularly the case in the Western NSW pastoral zone, where agricultural clearing has had the greatest proportional negative impact on areas of existing vegetation (NSW DPIE 2021).

Economic opportunities presented by favourable market signals, particularly high livestock prices, have been identified as the primary driver of land clearing in Western NSW (Heagney et al 2021): more cleared land provides the opportunity to run more livestock. A record gross value for Australian agriculture, as well as predictions for sustained high commodity prices (ABARES 2022), are indicators that high rates of land clearing will continue in Western NSW in the absence of alternative financial incentives.

What are Avoided Deforestation carbon projects?

The ERF Avoided Deforestation (AD) method was initially approved in 2013 under the then Labor government and has remained relatively unchanged since.

Projects applying this method protect native forest on land that would otherwise be cleared for cropland or grassland. AD projects reduce the greenhouse gas emissions entering the atmosphere by avoiding the emissions that would have occurred when the vegetation was cleared. In this respect the benefit that is realised from an avoided deforestation project taking place on land that would otherwise have been cleared is not unlike the benefit that is realised from switching from fossil based fuel to renewable energy - in both cases emissions have been averted from entering the atmosphere.

The climate benefits that stem from these avoided emissions are permanent and irreversible. So long as we account for leakage and the measurement is accurate, the benefit cannot not be undone even if there are future increases in emissions from the same source.

Vegetation-based carbon abatement projects are designed to store carbon over a defined extended time-period to ensure that there is a 'permanent' removal of the risk of emissions from clearing. AD projects are therefore subject to a 'permanence' obligation, which is the period of time the forest carbon stock must be maintained. Under the AD method, this is a period of either 25 or 100 years. Projects that opt for the 25-year permanence period are credited with carbon abatement at a discounted rate equal to 20%.

To this end, there are only 64 active AD projects listed on the ERF Project Register, of which, all but two have elected the 100-year permanence period. There are a limited number of AD projects, in comparison to other methods, because the AD method can only be applied in very particular circumstances.

Can AD take place on any piece of land or across an entire property?

No. In order to reduce the risk of over-estimating not only the quantity, but also the extent to which a project can generate carbon abatement, ERF methods are designed to be conservative, in both procedure and measurement,

AD is a very targeted method. When a landholder runs an AD project on their property, only a subset of the entire area of land that makes up the property is set aside and counted for carbon abatement.

AD projects are restricted to land on which native forest is present and threatened by clearing that would lead to deforestation. This threat is known as 'the baseline' – the clearing that would have happened in the absence of the carbon project.

In addition, any prescribed clearing restrictions relevant to the project area are taken into account, further reducing its size and, accordingly, the abatement calculations.

To date, all the projects applying the AD method have taken place in NSW, however it is available for use anywhere in Australia. In other states, similar types of projects have been undertaken under other methods, including the Avoided Clearing and the Native Forest from Manage Regrowth methods.

The area of a property that is eligible for crediting under an AD project is limited to native forest approved for paddock-scale clearing, which is a comparatively small fraction of the entire area.

The AD method specifies a number of criteria that must be met before an area can be eligible to generate carbon abatement. These are:

- **Pre-July 2010 Clearing Consents** – a landholder’s application to clear must have been approved prior to July 2010. In NSW, this means an Invasive Native Species Property Vegetation Plan (INS PVP) must have been issued by Local Land Services (LLS) prior to July 2010.
 - An INS PVP authorised landholders to clear vegetation classed as ‘invasive native species’ (INS) for cropping and grazing under the *Native Vegetation Act 2003* (which was repealed in 2017). This cut-off date was put in place to maintain additionality, [e.g. genuine intent to clear vegetation, based on gaining approval prior to inception of the Carbon Farming Initiative (CFI)], thereby upholding scheme integrity. By July 2010, when the CFI was introduced, hundreds of PVPs had been issued to authorise clearing of INS.
- **Invasive native species** – is a classification of native woodland and forest, with a specified species composition that, at high densities, are not considered optimal for grazing. These native woodlands provide natural habitat and biodiversity benefits, shelter for livestock and represent a significant carbon sink. Management of INS has been the subject of much policy debate. The LLS currently promotes management of INS to achieve mosaic landscapes made up of native pastures, open woodlands and denser areas for social, environmental and economic benefits (NSW Local Land Services 2014).
- **Paddock scale clearing** - PVPs were issued to both provide clearing consent and to delineate the areas upon which a number of specified vegetation treatments were permitted. Vegetation treatments, or management actions, included thinning, burning, chemical and mechanical removals. These could take place with varying degrees of ground disturbance and at varying scales, i.e. from removal of individual stems through to paddock-scale clearing. Paddock scale clearing is the only approved treatment that would lead to deforestation. Only areas delineated as such are eligible under the AD method.
- **Forest cover** – AD projects are restricted to areas that can be defined as ‘forest’ under the CFI Legislation. ‘Forest’ is defined as being an area of at least 0.2 hectares, consisting of vegetation that has at least 20% canopy cover and is at least two metres in height. Only native forest authorised for paddock-scale clearing is eligible under the AD Method.
- **Broad retention requirement** - The legislation further requires that a proportion of the representative vegetation approved for clearing be retained, usually 20%, which effectively operates as a buffer zone. This retention area further reduces the extent of eligible land that can be used for an AD project - in this example, to 80%.
- **Specified retention requirements** – PVPs prescribe clearing restraints for specified vegetation types, including: restrictions on clearing individual trees within specified size classes; restrictions on clearing non-INS species and; protection of riparian zones and steep areas with a slope greater than 17%.

In addition, to maintain conservative estimates, relevant carbon pools - such as deadwood and soil carbon - are excluded from carbon abatement calculations for AD projects.

Criticisms and concerns raised over the effectiveness of Avoided Deforestation Projects

Avoided deforestation projects have been criticised for taking place on land that was at no real threat of clearing. Is this a genuine risk?

If an AD project took place on land that was at no threat of clearing, then the baseline would be invalid and the project would be non-additional - i.e., it would not be contributing to genuine emissions reductions. Any credits generated from the project would therefore be legitimately problematic.

A number of critics of the AD methodology cite two specific factors as contributing to a significant over-estimation of emissions reductions from the existing avoided deforestation projects:

- a) the total amount of area that has been approved for clearing in the Western Division of NSW; and
- b) the background rate of actual clearing in the same region.

a) Over-estimation criticism 1 - The area approved for clearing

The Australia Institute and others have correctly noted that there is between 2.2 million ha (The Australia Institute 2021) and 5 million ha (Secombe 2022) of land covered by issued INS PVPs across the Western Division. They have described this as the area of land for which clearing consent has been provided. This data comes from the NSW public register of INS PVPs and from Development Consents that provided the basis for allowing clearing to occur during the operation of the Native Vegetation Act from 2005-2017. (NSW DPE 2022)

This large hectareage has been cited as one of the reasons that the AD baseline is invalid. This argument is based on the historical clearing rates in the Western Division, which have been much lower than the rate that would be required to clear 2 to 5 million hectares within the timeframes of the consents. This would mean the clearing rate would need to be anywhere from 7.5 to 120 times higher than the historical average for the Western Division.

The reality, however, is that there is not 2.2 nor 5 million ha of land for which clearing consent has been provided. This number actually represents the extent of INS identified on the properties with INS PVPs, not the area approved for clearing. In fact, the actual area approved for clearing is not accurately shown on the public register, which currently erroneously shows a figure of only 58 ha (NSW DPE 2022).

The area that is actually approved for paddock scale clearing is significantly less than the identified INS extent. Each property that has an INS PVP was first mapped by the now defunct Western Catchment Management Authority into different vegetation and management zones, according to the requirements of the Native Vegetation Act 2003. These different zones were created to prescribe appropriate treatment types for different environmental characteristics (e.g. vegetation cover, soil type, riparian, slope greater than 17 degrees, different species, age classes, remnant vegetation etc).

The types of possible treatment types under INS PVPs range from limited interventions, such as clearing of individual plants and burning, through to paddock scale clearing with longer-term disturbance to soil and ground cover. Paddock clearing with disturbance to soil and ground cover is the only type of clearing recognised under the method which leads to deforestation. It is typically targeted towards areas suitable for cropping and conversion to grassland for pasture. While this is the least restrictive treatment type, it has the most limited range of environments in which it may be applied.

The zones include a range of vegetation types, from sparse open grasslands and shrublands through to open woodland forests.

Throughout the Western Division, there is a great deal of variation between INS PVPs, partly because of the diversity of the landscape. While there are INS PVPs covering large tracts of land all the way out to Broken Hill, these typically do not cover or

allow for broadscale clearing of forest. Even within areas of significant forest, many INS PVPs may only allow for a limited percentage of the land to be cleared (for example, less than 10% of the INS extent) or permit no paddock scale clearing at all. Unfortunately, the specifics detailing the spatial extent of management zones defined in PVPs and thus, the area approved for paddock scale clearing, is not publicly available information. PVPs are the property of landholders and form the basis of project design. GreenCollar has been granted permission by individual landholders to look at a significant number of the PVPs (approximately half of all PVPs issued prior to 2010).

When all of the above considerations are taken into account, the area of land that is actually approved for paddock scale clearing in the Western Division in areas of actual forest cover, and therefore at potential risk, is conservatively estimated by GreenCollar to be no more than 690k ha. In all probability, when all the retention requirements of the PVP are taken into account, it is likely to be considerably less.

For example, a typical requirement is to retain individual trees, for species' such as Box (*Eucalyptus populnea*) or White Cypress (*Calitris glaucophylla*) that have a stem diameter greater than 20cm, and an additional 10 ha per 100 ha of individuals with stem diameters less than 20cm. This retention could account for as much as 50% of the area. These trees are excluded from any calculation of carbon credits as they would not be cleared.

The actual area approved for clearing is anywhere between 1500-400% lower than the area understood to be approved for clearing by the Australia Institute and others.

b) Overestimation criticism 2 - The rate of clearing

The rate of clearing has been cited as the other reason that the AD baseline is invalid: i.e., that the contemporary clearing rate in the Western Division is not high enough to have resulted in the clearing of the areas protected by the AD projects.

In reaching this conclusion, The Australia Institute used an assessment of the state-wide vegetation cover data to calculate an historical average clearing rate of between ~2000 and ~4000 ha per annum in the Western Division (The Australia Institute 2021).

On this basis, if it were correct that there were 2.2-5 million ha of total clearing permits, and this was the actual clearing rate, then it would be true that it would take a long time for this area to be cleared. Yet, as established above, the area of approved clearing permits is not this high.

Like the estimate of clearing permit area, the estimate of the background clearing rate of between 2000 and 4000 ha per annum is also flawed.

The Australia Institute seems to have extrapolated clearing data from the period during which the Native Vegetation Act was in operation and applied it across a period where it was not - 1988-2003. This is a period where public data on land clearing in this region is not readily available, but known to have been extremely high. This calculator approach results in a vast understatement.

For example, the report cites clearing rates in the Western Division for 2009-13 to be 1019 hectares per annum and for 2014-19, 4,372 ha/pa. Extrapolating this data for pre-2003 - when there was minimal legislative protection of vegetation and estimates by Norton put clearing at 430,000 ha/pa from 1972-1980 and 80,000 ha/pa from 1986-96 - is extremely questionable.

This approach is also flawed for a number of other reasons. Specifically, comparing the NSW SLATS analysis, which utilises SPOT-6 and Sentinel satellite imagery, to earlier time periods where the analysis has been made with Landsat - noting the comments above about resolution and why this is problematic.

Additionally, rather than looking at the Western Division as a whole, the more appropriate comparison would be to look at the specific bioregion within it, where AD projects occur - in this case, predominantly the Cobar Penneplain. There is a significant difference between the Western Division and Cobar Penneplain clearing rates, with the rate on the penneplain bioregion significantly higher than across the entire Western Division.

Most importantly, however, the analysis has not explored any counter-factual scenario for what the clearing rate on the Cobar Penneplain would have been in the absence of the carbon projects.

The period of time for which we have district and bioregion specific clearing data from SLATS begins only in 2009. Between 2005 and 2017, the only legal way to clear was under an INS PVP, the first of which were issued in May 2006 - and significant numbers only began being issued after 2007. From mid 2010 onwards, a significant number of the properties on the Cobar Penneplain with PVPs began entering into carbon projects, both AD and Human Induced Regeneration (HIR). Once these projects commenced, the option to clear under the PVPs effectively ceased. This significantly reduced the amount of area that could be cleared from 2010 until the present.

To make a meaningful comparison of the clearing rates, it is necessary to develop the counter-factual scenario in order to determine what the clearing rate would have been in the absence of the carbon project.

In this regard there are several important considerations, which include:

1. the Native Vegetation Act was brought in to expressly slow the rate of clearing in Western NSW, including across the Cobar Penneplain;
2. the INS PVP was later introduced to explicitly again allow for clearing and the local Catchment Management Authority (CMA) had an express objective of encouraging and incentivising landholders to clear (by contrast, for the first few years of the carbon projects, there was significant conflict with the CMA and other stakeholders who were very concerned that the carbon projects were stopping clearing from happening that they specifically wanted to happen);
3. following the removal of a requirement for an INS PVP in 2017, and a shift to self-assessment, the clearing rate on the Cobar Penneplain has averaged greater than 11k ha per annum (In 2018 it was 15k ha) and is likely to be closer to the historical average prior to the introduction of the NVA;
4. the increase in the current clearing rate is happening despite the ongoing presence of the carbon projects, which dramatically reduce the amount of land available to clear; and
5. the reported clearing rates in SLATS only cover woody vegetation and not the surrounding non-woody vegetation, whereas the areas of the carbon projects include both.

When consideration of the two overestimation criticisms is properly given - a) the much smaller area of land actually approved to be cleared and the impact of b) policy and the actual carbon projects on the clearing rate - the current clearing rate in the Cobar Penneplain is entirely consistent with the expected baseline scenario for the AD projects.

A more detailed analysis, however, is required to determine more precise counter-factual scenarios. This is important because there are still opportunities to undertake further avoided clearing projects in areas of the state where clearing remains a serious issue. GreenCollar, as well as the NSW State Government and others, are currently working on separate analyses to explore this issue in further depth.

Was it possible to seek a clearing permit for the express purpose of subsequently retiring it to undertake a carbon project?

No. As stated above, only projects that already had clearing permits in place prior to 1 July 2010 are eligible under this method. This was prior to the announcement of the CFI and two years before a method was approved under which a project could be undertaken.

Are there enough bulldozers in NSW to clear the area protected under the AD projects?

It has been widely reported that there are not enough bulldozers in NSW to protect the area under carbon projects (Slezak, M & Tiimms, P 2021) The area protected by the AD projects is no greater than 300k ha, protected for a period of 100 years.

There was nearly a million hectares of vegetation cleared in 2018-2019 in Australia and at least 85,000 ha in NSW alone. So, yes, there are more than enough bulldozers.

Is carbon farming driving land clearing? Is it hypocritical/ a conflict of interest for landowners with carbon projects to still be clearing land elsewhere?

No to both questions.

The driver of land clearing is agricultural production. This in turn varies in response to seasonal and climatic conditions, the point in the regrowth cycle of vegetation and, most significantly, commodity prices. As has been noted above, despite suggestions to the contrary by the critics of the method, that land clearing is very much continuing at scale in the districts with carbon projects.

Both the landholders that run carbon projects, and those who don't, are in the business of agricultural production. They were before carbon projects came along, and they will be after the carbon projects come to an end. In the absence of incentives not to clear - like a carbon project - it is highly probable that they will continue to clear land, just as they always have - because this remains one of the key ways to improve the productive and capital value of grazing and cropping properties.

This has very little to do with the addition of income from carbon.

If this is true, then why so much scrutiny?

It is important to scrutinise the projects and methods in order to ensure that they are delivering what they claim to deliver. This also ensures that buyers of credits and the public can have confidence in the integrity of the market.

There are legitimate questions to ask and areas of research that must continue.

The policies surrounding these projects are also the subject of a wide range of views. This means the conversation often gets drawn into the political debate where, unfortunately, sometimes the politics gets confused with the science.

Who is GreenCollar?

GreenCollar is an independently owned profit-for-purpose project developer and investor in environmental markets projects. We have been a registered B-Corp for nearly 5 years.

We have been around for just over a decade and operate projects in carbon, biodiversity, water quality and plastic removals markets in partnership with pastoralists, graziers, farmers, Aboriginal organisations and conservation bodies throughout Australia.

We are not owned by interests in the oil and gas sector or other emissions-intensive industries. Our business is approximately 25% staff owned. KKR's Global Impact Investment Fund and Ontario Teachers Pension Plan are also now significant shareholders.

We sell credits from our projects to a range of businesses as well as government.

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