



AgCarE

Agriculture, Carbon and The Environment

Natural Capital Certification for Landscape Resilience

AgCarE is an accounting model which has been developed by AgForce to identify and acknowledge property performance in building Natural Capital



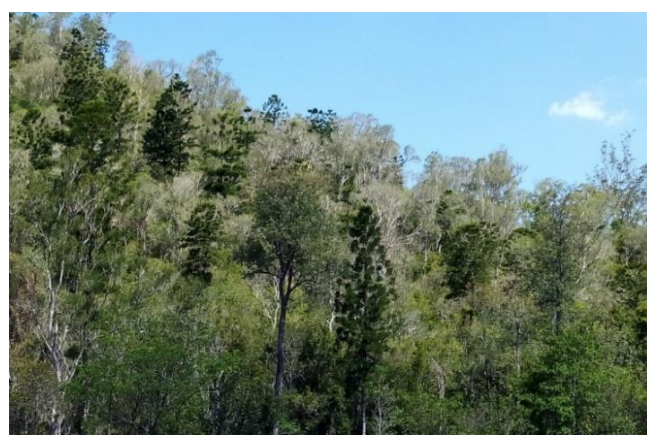
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Introduction

Australian farmers are stewards to the majority of the Australian landscape. Their knowledge and experience is readily recognised, but not always rewarded, and sadly they are under- engaged in current programs. There is potential for a systematic approach that engages, energises and enriches the majority managers in looking after Australia’s landscape and AgForce Qld has a critical role to play.

Success is more likely through a broadly adopted land stewardship program where the barriers to entry are small and the risk of government-imposed regulation minimised. Trust is integral. Long term commercial success is very dependent on trust and relies on a robust verification of claims. Verification should be highly transparent, repeatable, on a sliding scale and rewarded accordingly.



Developed by Farmers for Farmers- A Model for High Farmer Uptake in the Natural Capital Marketplace

AgCarE is a Natural Capital Certification for Landscape Resilience methodology that has been developed as a mid-tier system that acknowledges and rates property performance for building natural capital, but stands below the standards demanded of existing carbon trading schemes. Closely aligned with the Landcare movement, which has a legacy of Australians caring for the land and water that sustain us, **AgCarE** seeks to support the agricultural enterprises that sustain us. The ‘ERF or bust’ system now in place is failing to deliver broadscale changes in practice with low uptake from the agricultural sector.

The AgCarE Program

An 'on-farm' Natural Capital audit which includes a baseline condition assessment of 'on farm' assets underpins the *AgCarE* program. Natural Capital is the world's stock of natural resources which includes geology, soils, air, water and all living organisms. Many natural capital assets provide people with free goods and services, frequently called ecosystems services. The world is trending towards a market-based system for valuing natural capital. Recent decades have shown an increase in Payments for Ecosystem Services (PES) programs and the introduction of natural capital accounting standards. *AgCarE* is being developed to align with international Natural Capital Accounting standards (See: <https://seea.un.org/>).

The *AgCarE* audit allows for the participant to increase their rating utilising more rigorous, independent verification tools like the VAST or Accounting for Nature frameworks, the FAO Carbon test, Soil carbon tests, Groundcover assessments, Forestry Practice survey of vegetation. Following an initial baseline assessment, ongoing monitoring then indicates decreasing, stable or increasing Natural Capital condition. *AgCarE* starts with a self-assessable survey, scalable to a peer-to-peer verification which assesses ten metrics on a sliding scale of scoring of Natural Capital condition:

1. Sustainable Carbon Property Plan – Property management planning at a 15+-year scale that considers long-term holistic landscape management, business management options and outlines management actions that build Natural Capital.
2. Remnant Vegetation – Bio-condition scoring of Regional Ecosystems against known benchmarks and historic evidence of vegetation extent and configuration i.e. pre-clearing or 1788.
3. Non-Remnant Vegetation on modified landscapes – Metrics of vegetation on non-remnant grazing farmland.
4. Soil Condition – Recognition of methodologies that measure maintenance and improvement of soil carbon sequestration and soil health attributes.
5. Biodiversity – Measurement of actions to maintain and restore biodiversity including management of wildlife corridors, nature refuges, pests, weeds and biosecurity.
6. Runoff and Water Quality – Measurement of sediment load and suspended loads coming off property.
7. Stock – Herd management and benchmarking against regional averages that reduce methane emissions, principally through earlier age of turnoff and increased fertility.
8. High Value Agriculture – Measurement of carbon sequestration and losses in developed farming operations (including input-output recording of chemical use and harvested material).
9. Energy Savings – Measurement of energy use and efforts to reduce emissions such as; remote monitoring, solar power, diesel reduction, efficient machinery.
10. Social Education and Research – Recognition of landholder participation in capacity building activities and peer interactions. This also includes consideration of social wellbeing and mental health benefits that are generated from healthy landscapes.

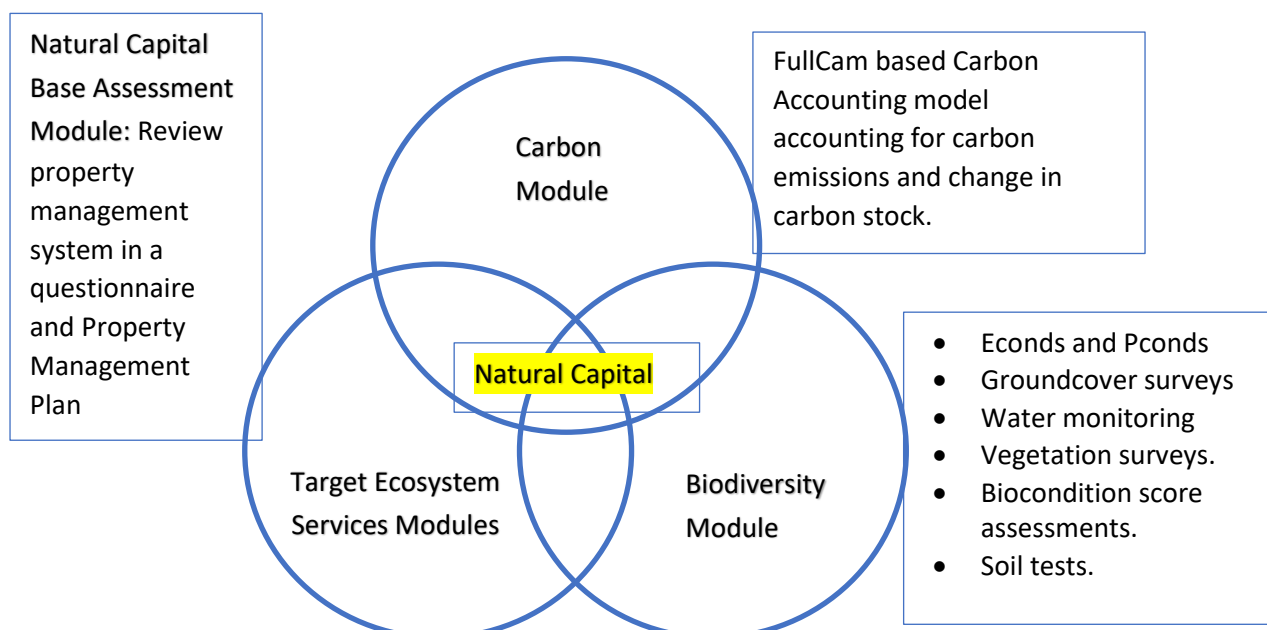


Figure 1: The linkages between key systems within *AgCarE*

Low-Cost Capacity Building Method

AgCarE is a self-assessable method. It is accessible, inexpensive to implement, similar to programs like Best Management Practice (BMP) that have preceded it, and designed to engage a large base of land managers. The aim is to provide landowners with full access to data collection and condition assessment thereby improving knowledge and ownership.

It is less rigorous than carbon project standards under the Clean Energy Regulator and, of itself, would be unable to deliver more than a basic certification level. *AgCarE* takes a modular approach and uses a grading system of Bronze, Silver, Gold or Platinum based on the assessment score. The achievement of higher scores will be dependent on the physical attributes of the property as well as working through the below Modules and assessment of carbon, biodiversity and/or target ecosystem services.

| <i>AgCarE</i> Modular Approach | Bronze | Silver | Gold | Platinum |
|---|---------------|---------------|-------------|-----------------|
| <i>AgCarE</i> Natural Capital Base Assessment | 1 - 9 | 10 - 17 | 18 - 25 | 26 - 30 |
| <i>AgCarE</i> + C | 31 - 39 | 40 - 47 | 48 - 55 | 56 - 60 |
| <i>AgCarE</i> + C + Biodiversity | 61 - 69 | 70 - 77 | 78 - 85 | 86 - 90 |
| <i>AgCarE</i> + C + Biodiversity + Target Ecosystem Services | 91 - 99 | 100 - 107 | 108 - 115 | 116 - 120 |

Figure 2: *AgCarE* scoring chart.

The *AgCarE* program does not require that modules are completed sequentially. The above scoring table is only an example. Following the *AgCarE* Natural Capital Base Assessment, landowners can ‘plug-and-play’ other modules at their discretion to improve their property score.

AgCarE Natural Capital Base Assessment Module

The entry point for the program is a Natural Capital assessment.

Participants answer a questionnaire which provides a basic score on landscape condition with particular focus on six outcomes areas:

1. Biodiversity.
2. Groundcover.
3. Increased biomass.
4. Water management.
5. Management of fire and grazing to protect and enhance remnant landscapes.
6. Landholder competencies in restoring, building and maintaining Natural Capital condition – this can include research, training and community involvement.

This assessment provides a benchmark for these areas of management and a basis for improving systems to deliver better outcomes and enhanced scores.



The example below demonstrates a case study in Central Queensland that has scored highly on *AgCarE*. The example farm has also identified areas of improvement that could lift biodiversity of their landscape and their Natural Capital scores.



Carbon Certification Landscape Resilience Program

Natural Capital

Natural Capital - Landholder Checklist

| Questions | Answer Yes/No | Details | Points |
|---|------------------|---------|--------------|
| Groundcover - Soils | | | |
| Do you do conduct regular pasture monitoring in accordance with appropriate standards, BMP etc? | 1 | | 0/1 |
| Do you utilise Longpaddock or similar satellite tools to monitor groundcover over time? | 0.5 | | 0/5 |
| Have you maintained data from previous pasture monitoring programs that can verify/ground truth the satellite monitoring tools currently available? | 0.5 | | 0/5 |
| Do you employ time controlled grazing either through cell or rotational grazing principals whereby all of the land involved has a minimum of three months rest each year? | 1 | | 0/1 |
| Sub Total | 3 | | 0/3 |
| Soil Improvement | | | |
| Do you conduct soil tests of the land you manage? | 0.5 | | 0/5 |
| Do you apply compost and or natural fertilisers? | 0.5 | | 0/5 |
| Do you apply slow release fertilisers like lime, gypsum, rock phosphate? | 0.5 | | 0/5 |
| Sub Total | 1.5 | | 0/1.5 |
| Cover Crops | | | |
| Do you pasture crop with oates, barley or wheat while maintaining groundcover for most of the year? | 0.5 | | 0/5 |
| Do you cover crop where one or more crops are turned in annually? | 0.5 | | 0/5 |
| Do you use multi- species cover crops? | 0 | | 0/5 |
| Do you grow winter cereals for stock grazing? | 0.5 | | 0/5 |
| Sub Total | 1.5 | | 0/2 |
| Cropland to Pasture Conversion | | | |
| Have you converted cropping country to pasture in the past 12 months? | 0 | | 0/1 |
| Sub Total | | | 0/1 |
| Vegetation on Non-remnant Land | | | |
| Do you maintain trees on your non-remnant land? | 1 | | 0/1 |
| Have you measured the volume of trees on non-remnant land using Forestry methodology or other on-ground monitoring? | 0 | | 0/1 |
| Sub Total | 1 | | 0/2 |
| Stock | | | |
| Do you maintain a stocktake of class and number of stock on hand at regular intervals? Are you able to provide a breakdown of class of cattle, age and weights over time? | 0.5 | | 0/5 |
| Can you demonstrate a pattern of earlier turnoff and/or heavier weights or larger numbers carried? | 0.5 | | 0/5 |
| Do you buy seedstock with EBV data? If so can you demonstrate a | | | |



| | | |
|--|------------|--------------|
| Do you offer farm stay or similar agri-tourism? | 0 | 0/5 |
| Sub Total | 1 | 0/1.5 |
| Sustainable Natural Capital Property Plan | | |
| Do you have a dedicated Natural Capital Property Plan which outlines the pathway to improved Natural Capital outcomes over a 15 year period? | 0 | 0/2 |
| Sub Total | 0 | 0/2 |
| Energy Savings | | |
| Have you implemented energy saving processes that reduce your use of fuel and/or electricity? The use of solar, wind, ethanol etc? | 0 | 0/5 |
| Can you demonstrate a reduction over time in your use of electricity or fuel? | 0 | 0/5 |
| Sub Total | 0 | 0/1 |
| Biodiversity | | |
| Have you implemented programs that actively increase the biodiversity of the land you manage? | 0.5 | 0/5 |
| Do you have and maintain wildlife corridors, essential habitat, koala habitat, protected plants etc on farm? | 0.5 | 0/5 |
| Do you have an E-Cond score? | 0 | 0/3 |
| Established a Nature Refuge? | 0.5 | 0/5 |
| Are you certified organic? | 0 | 0/5 |
| Do have any nationally threatened species that you are actively protecting on farm ? | 1 | 0/1 |
| Do you any have any RAMSAR or locally important wetlands that you are actively managing on farms? | 0 | 0/1 |
| Do you actively control feral animals on property? | 0.5 | 0/5 |
| Have you or your staff completed any accredited biodiversity training ? | 0.5 | 0/5 |
| Sub Total | 3.5 | 0/8 |
| Total: | | |
| Total Points: 0/30 | | |

Rating: Gold (18 points)

Rating System

| | |
|----------|------------|
| Platinum | 26+/30 |
| Gold | 18 - 25/30 |
| Silver | 10 - 17/30 |
| Bronze | 1 - 9/30 |

It would be expected that the data provided could, over time, contribute to enhancing the questions and scoring system. There is also an opportunity to introduce a Peer-to-Peer verification system.

Carbon Module.

Module two measures the net carbon performance of the landscape managed. Whilst not a representation of biodiversity, it is widely recognised that higher carbon sequestration levels in the landscape make for a more resilient environment. Carbon is also more widely understood by the consumer and can be measured accurately.

A critical assumption is that a land manager's carbon footprint includes an account of both carbon emissions (fuel, electricity, methane produced by stock) and a full account of carbon sequestered from mitigation programs and from the landscape managed, even if those carbon credits are in the form of remnant timber that is already included in the national carbon accounts.

AgForce engaged the services of Greenfields Consultancy to identify a carbon accounting model that is accurate, utilising fullCAM, but is also accessible and affordable. Again, this being with the view of engaging as large a base of landholders as possible.

The base model adopted is the internationally recognised FAO carbon accounting program. This model uses the latest available data to account for a wide variety of carbon inputs as well as a diverse spectrum of carbon sequestration calculations for various forms of vegetation and land types.



In the example below a case study farm in central Queensland has been rated at CN 2+, which indicates that the farm sequesters two tonnes of CO₂ equivalent per Ha per year after taking into account carbon emissions from electricity, fuel, fertilisers and the cattle on hand. This is a larger cattle farm -carrying 3000 head of cattle and engaging in regular farming - both dry land and irrigated. The case study farm also maintains a sizeable area of remnant forest. At around 20% of the land area this would be unusually high for southern Australian agriculture, but low for agricultural farms in northern Australia.

The levels of carbon emissions from sources like cattle on grasslands, as well as the level of carbon sequestration from landscapes - especially grasslands and various farming systems - is an evolving science and these models would require regular updating.

The inclusion of an independent carbon accounting module adds rigor to the program and in combination with the Natural Capital module would be required for any likely market based standard or government assistance.



Carbon Certification Landscape Resilience Program

Results

Property Name: Gyranda
Soils: Dermosols
Climate: Sub-tropical
Total Area (ha): 9141.2

Components All GHG in tCO₂e Results Per Year Balance
Positive = emitting/ negative = sink

Trees (Vegetation)

| | | | |
|--------------------------|---------|---------|---------|
| Eucalyptus Woodland | -17,805 | -17,805 | -17,805 |
| Eucalyptus Open Woodland | -4,070 | -4,070 | -4,070 |

Grassland (Vegetation)

| | | | |
|-------------------------------|--------|--------|--------|
| Sub-tropical Improved pasture | -7,047 | -7,047 | -7,047 |
| Sub-tropical grasslands | -8 | -8 | -8 |

Livestock

| | | | |
|-------------|------|------|------|
| Beef Cattle | 3225 | 3225 | 3225 |
|-------------|------|------|------|

Fertilisers & Pesticides

| | | | |
|--|---|---|---|
| | 0 | 0 | 0 |
|--|---|---|---|

Cropping

| | | | |
|--------------|------|------|------|
| Beans/Pulses | -207 | -207 | -207 |
| Leucaena | -502 | -502 | -502 |

Energy Usage

| | | | |
|-------------|-----|-----|-----|
| Electricity | 169 | 169 | 169 |
| Diesel | 42 | 42 | 42 |
| Petrol | 6 | 6 | 6 |

| | | | |
|--------------------------|--|--|----------------|
| Total | | | -26,197 |
| Total Per Hectare | | | -2.8 |

Rating: CN+

Biodiversity Module.

The third Module of this program identifies advanced Biodiversity tools that further enhance a land manager's Natural Capital credentials and help to improve management in those areas. They come with various levels of complexity and cost and it is the choice of the land manager which of these tools they may wish to employ. A normal cost/benefit analysis dependent on the incentives applied.

1. VAST Framework

- a. The VAST framework (Vegetation Assets, States and Transitions) was developed by the Australian Government and by Richard Thackway. VAST is peer reviewed and internationally recognized. The VAST framework can be used:
 - (i) to produce reliable property level maps of environmental states and transitions including changes and trends in the extent and condition of land types, relative to pre-European reference states; and
 - (ii) to produce property level report cards of changes and trends in the environmental condition of land types using land manager site and landscape observations of the responses of ecological indicators to changes in land management over time
- b. Multiple criteria and indicators, including vegetation structure and composition, soil health and ecological functions, are designed to provide repeatable and robust, but simple, inexpensive and rapid tools for land managers to assess change over time.
- c. The VAST framework requires a skilled land manager and a relatively low level of financial investment and ongoing monitoring.

2. Accounting for Nature Framework

- a. The Accounting for Nature Framework (AfN) was developed by the Wentworth Group of Scientists. Regional trials of the AfN framework demonstrated the development and application of two metrics for assessing biodiversity and productivity from farming landscapes, Econds and Pconds respectively. Native vegetation is assessed relative to a pre-clearing reference state.
- b. AfN Pty Ltd and the AfN framework are recognized by the Queensland Government's Land Restoration Fund as the certification system for co-benefits received as part of registered carbon projects at the property level. Native vegetation and soils methodologies have been developed.
- c. The AfN framework requires a higher level of financial investment and ongoing monitoring. Applying this framework requires trained analysts. See: <https://www.accountingfornature.org/>

3. Bio-condition Assessment.

- a. The Queensland Herbarium has developed guidelines for independent assessment of bio-condition in a landscape that can be undertaken by trained consultants or skilled managers. This is a reliable site-based, repeatable program that is less costly than VAST and AfN.

- b. In Central Queensland the Fitzroy Basin Association has gone further to develop a 'Bio-condition lite' (BioCat) assessment program, based on the Herbarium's Bio-condition Assessment but more accessible for landholders.
- 4. Forestry Assessment of Trees on Non-Remnant Landscapes.**
 - a. Utilising the same tools used in forestry a landholder is able to determine volume and extent of vegetation on their non-remnant landscape.
- 5. Independent Groundcover Assessment.**
 - a. Programs like Queensland Government's Longpaddock offer a real-time analysis of groundcover, changes over time and comparison of land types. See: <https://www.longpaddock.qld.gov.au/>
 - b. Such accepted online programs offer a cheap and readily available independent assessment tools that can be augmented with on-ground survey work.
- 6. Soil, Water and Dust and Noise**
 - a. Commercially available tests are able to demonstrate changes in soil composition, organic matter, water quality etc. over time.

Target Ecosystem Services Modules.

Further Modules are being developed that measure high priority or target ecosystem services which can be measured, valued, monitored, monetised and traded at property scale. Examples include ecosystem services such as Pollination, an essential element of healthy reproduction and persistence, or Water Quality, where municipal Councils are able to reduce water treatment costs in town water supplies. The Landcare Farming [Soil Assessment for Productive Land](#) method can assist with aspects such as soil health, as can the Queensland Government [Water Monitoring and Sampling Manual](#) for measuring water quality.

Conclusion.

It is expected that the low barrier to entry and limited cost will enable *AgCarE* to be a widely adopted program that provides genuine scalability for landowners and primary producers who perform well in managing their landscape for resilience and biodiversity.

It also provides a genuine product that may be either commercially marketed as an exchangeable product, or premium for food and fibre produced on the property. Alternately *AgCarE* can be rewarded by government incentives for the achievement of identified environmental priorities. In the initial phase this may be the Gold or Platinum standards only, but depending on supply and demand, may also encompass the Silver and Bronze participants over time. When landowners and managers see a genuine financial reward, they will be more likely to invest in attaining Silver or Gold standards. The collective data from high landholder participation will enable a more rigorous program to be built over time.