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Science Agency

# Regional Ecosystem Accounting Pilot projects: First Nations engagement on ecosystem models and recommendations

A report from the Regional Ecosystem Accounting Pilot projects

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September 2023



## Citation

Woodward E, Jarvis D, Grainger D, Ewamian Ltd, Ewamian People Aboriginal Corporation RNTBC, Tagalaka Aboriginal Corporation RNTBC, Kooyar Wongi Pty Ltd, Schmidt RK and Tetreault-Campbell S (2023) Regional Ecosystem Accounting Pilot projects: First Nations engagement on ecosystem models and recommendations. A report from the Regional Ecosystem Accounting Pilot projects. CSIRO. <https://doi.org/10.25919/fstw-r316>

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## Acknowledgements

This is an output of the *Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes* project, one of two Regional Ecosystem Accounting Pilot projects. These are a scientific collaboration between the Department of Climate Change, Energy, the Environment and Water (DCCEEW), CSIRO and others. This project has been funded by DCCEEW under the *Strategy and Action Plan for a Common National Approach to Environmental Economic Accounting*. For more information see <http://eea.environment.gov.au>.

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# Acknowledgements

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We thank David Collard for his cultural guidance of the methodology for the Western Australian Wheatbelt pilot region.

We would like to thank Ewamian Ltd and Ewamian People Aboriginal Corporation RNTBC for the valuable support provided to this project. We would like to particularly thank the General Manager and the Board members Sharon Prior, Ken Georgetown, Barry Fisher, Alfred Lacey, Michell Kapteyn, Judy Prior, Brian Bing and Deidre Brumby who contributed their time, knowledge and insights at the project workshops. Ewamian People Aboriginal Corporation RNTBC (EPAC) is the centre of the Ewamian corporate group and holds Native Title for Ewamian people. EPAC Board is also appointed as the Ewamian Limited Board and acts as the Trustee of the Ewamian People's Charitable Trust. As the sole member of Ewamian Limited, EPAC authorises all Ewamian Limited activities and any spending from the Ewamian People's Charitable Trust. Ewamian Limited (EL) is a not-for-profit charity and the operational side of the Ewamian corporate group, providing administration, governance and corporate services on behalf of Ewamian people such as negotiating and managing agreements and employing staff to ensure ongoing sustainability of the corporate group.

We would like to thank the Tagalaka Aboriginal Corporation for the valuable support provided to this project. We would like to particularly thank the Board members Alfred Owens, Garry Owens, Carmen Mitchell, Lea 'Jeanie' Govan, Lee-anne Owens, Samantha Eaton and Russell Eaton who contributed their time, knowledge and insights at the project workshops. We would also like to thank Alison Quin, of the Tagalaka people, for her helpful comments and suggestions.

We also gratefully acknowledge the input provided by participants at the 'Developing state and transition models to support ecosystem accounting of agricultural and mixed-use landscapes in the Western Australian Wheatbelt' workshop from 19 to 20 September 2022 (and subsequent online condition workshop on 24 November 2022). As well as additional input through online surveys of ecosystem condition for ecosystem states. The information provided at these workshops and surveys has been synthesised in this document. Experts who generously provided their time and feedback include: Brett Beecham, Dimity Boggs, Margaret Byrne, David Collard, Chris Curnow, Christophe D'Abbadie, Bonny Dunlop-Heague, Greg Durell, Paul Galloway, Carl

Gosper, Mike Griffiths, Alex Hams, Peta Kelsey, Sarah Luxton, Nathan McQuoid, Helena Mills, Owen Nevin, Tim Overheu, Tina Parkhurst, Blair Parsons, Keith Pekin, Tom Picton-Warlow, Clinton Rakich, Debbi Slater-Lee, Melanie Strawbridge, Grant Wardell-Johnson, Renee Young.

We gratefully acknowledge Nerilee Boshammer-Bennell (Kooyar Wongi Pty Ltd), Kirsten Maclean and Stephanie von Gavel for their peer review comments on an earlier version of this report which improved this final version.

This study has been approved by CSIRO's Social Science Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research (2007): ethics approval 115/22 and 170/22/ H8992 (James Cook University).

# Contributors

The Regional Ecosystem Accounting Pilot projects, under the Strategy and Action Plan for a Common National Approach to Environmental Economic Accounting, included two projects:

- Project 1: Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes
- Project 2: Ecosystem Accounts for the Murray-Darling Basin.

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# Executive summary

In April 2018, Commonwealth, State and Territory Environment Ministers agreed to a strategy and action plan for a common national approach to environmental-economic accounting. The Strategy committed governments to apply the United Nations framework, the System of Environmental-Economic Accounts (SEEA), to national accounts that address policy priorities.

To support development of a national approach, the Regional Ecosystem Accounting Pilot (REAP) projects (the 'REAP projects') delivered ecosystem accounts at a sub-national scale that aim to:

- demonstrate value for policy and decision making, engage key stakeholders and increase demand for an ongoing program of ecosystem accounts
- contribute towards the longer-term goal of national ecosystem accounts by testing methods that can be scaled nationally and by increasing capacity for ecosystem accounting in Commonwealth institutions.

A key aspect of the *Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes* project, one of two REAP projects, was to develop and test conceptual models of ecosystems in the context of First Nations engagement with these models, and determine whether they reflected a local First Nations understanding of ecosystems (Country and the cultural landscape), and where similarities and differences lay between the models and First Nations perspectives.

In Queensland the Tagalaka Aboriginal Corporation (TAC), and Ewamian Limited (EL) were selected for engagement (from the Flinders, Norman and Gilbert river catchments in north Queensland). CSIRO subcontracted James Cook University (JCU) to engage with First Nations peoples in the north Queensland pilot region to deliver on that component of the project. In Western Australia, the six endorsed Regional Corporations were approached initially as the peak bodies for Country management across the Noongar Nation (from the Wheatbelt region in Western Australia).

Central to understanding the role of First Nations peoples in the development of national ecosystem accounts is the fact that knowledge and understanding of Country, and the ecosystem benefits derived from Country, are place-based and highly localised to individual groups.

However, common to inclusion of all First Nations peoples in future ecosystem accounting projects is the need for attention to processes that enable full and meaningful engagement. These include sufficient time to participate, and appreciation that senior knowledge holders, who are the right people to be included in such discussions, are under constant pressure for their time and expertise. Ensuring sufficient time means being aware of local governance arrangements that underpin culturally-appropriate knowledge-sharing and understanding the processes for obtaining permissions where and when appropriate. Research engagements may require multiple levels of agreements and/or permissions prior to starting, which requires flexibility around other competing demands for the attention of senior people (including Corporation Boards and Cultural Advisors).

While determining the time necessary to undertake an appropriate and meaningful engagement will be guided by the local context, this will be influenced by whether prior relationships, and or frameworks, exist to support engagement (and this is relevant to both research projects and

information sharing events). For example, while a one-year project was just sufficient to engage with Tagalaka and Ewamian people, this was at least partially enabled by existing research relationships. In regards to engaging with Noongar First Nations groups, this was complicated by the emergence of new governance arrangements (and competing priorities), which coincided with the timeframes of the project. This required a rethink to the methodology, and through engagement of a Noongar consultant, the project was able to make some traction (and an 18-month project would have been more appropriate to deliver outcomes).

Other critical enablers of full and appropriate engagement and participation include:

- Co-design research processes that recognise and respect traditional and contemporary First Nations knowledge, and methods for working with knowledge. These notions aligned with the importance of self-determination recognised in research and as expressed by EL and TAC, to avoid merely consulting with First Nations groups and instead have a proper co-designed research partnership.
- Free, Prior and Informed Consent (FPIC) processes
- Attention to customary decision-making and cultural protocol.
- Adequate resourcing for First Nations participation. The sufficient allocation of time and money to ensure the right people and priorities were incorporated into work was considered a means to ensure meaningful collaborative research with First Nations partners takes place.

Key learnings in regards to future development of ecosystem accounts include:

1. Inclusion of First Nations in the development and review of ecosystem attributes that reflect First Nations' knowledge and understanding of Health of Country

Satellite imagery does not take into consideration what cannot be seen at the landscape surface, including culturally important parts of Country like caves, waterways, sub-surface features of Country, rock art, burials, and of course as yet unmapped cultural values, etc. This method of mapping and representing the land and sea also reinforces a one-dimensional view of the world that views Country only from above. It discounts the cultural landscape perspective, which values the interaction and intrinsic relationship between Country (the environment), culture (cultural heritage values and connection to Country), and community.

The Tagalaka Aboriginal Corporation Board recommended having two aligned approaches for the development of ecosystem accounts on their Country – Tagalaka-led on-ground, and CSIRO-led satellite based – for extent and condition data collection, bringing together two worldviews to provide richer and better quality reporting information. The Board were clear that both the Indigenous- and western-science-based approaches were important, and both should be used to validate each other.

2. Involvement of First Nations peoples in the ground-truthing of maps, and ongoing review of condition scores.

In the Queensland pilot region, ground-truthing of satellite maps by locally based First Nations Rangers was considered crucial by the Board members of both TAC and EL. This would not only provide valuable nuanced local-level information to complement satellite data, but would endorse the real need to resolve the access to Country issues that both First Nations groups face in management of land and cultural maintenance efforts. Specifically, information beyond

the flora detail of satellite maps (considered insufficient and at times unrelated to animal, bush tucker and waterway health) could be provided in a partnership arrangement between scientists and First Nations to enable a blended flow of knowledge. It would also resolve the perceived one-dimensional approach of using satellite imagery alone.

Further, the related condition scoring is seen by Board members from both Ewamian Ltd and Tagalaka Aboriginal Corporation as endogenous to land management, that is, scoring was something for use and updating at the local Ranger level and hence should be customised for local Ranger land management use rather than be a terse exogenous score living in a distant computer model.

Given the importance of ground-truthing by local TAC and EL Rangers to validate satellite maps and update condition scores, the removal of barriers to accessing Country needs to be addressed; possibly via new policies that provide an appropriate authorising environment for Rangers to perform the ecosystem accounting related works across all of their Native Title lands (including land not under their direct control, such as that used for agricultural and mining purposes).

The following recommendations are made to guide engagement with First Nations partners in future research project endeavours:

- Research driven by First Nations peoples, through co-design based on a culturally appropriate methodology, is fundamental.
- The projects that are designed need to align with existing initiatives, plans and programs, (i.e. Indigenous Protected Areas (IPAs), Indigenous Land and Sea Management strategies, and many other formal programs). Questions including: ‘How does the accounting for this project align with other current programs of management?’ should be asked early. Opportunities exist to improve these programs, build on effort, leverage off of already achieved outcomes, reduce potential for duplication, and contribute to improved accounting information, by increasing coordination across programs and funding organisations.
- Economic opportunities for engagement in biodiversity markets through a cultural landscape lens (i.e. considering the interaction between the environment, Aboriginal cultural heritage and community, and how this influences Western concepts of economic value), which are closely aligned to ecosystem accounting, require consideration.
- Working with First Nations people, alongside scientists, industry representatives and other partners, can improve the quality of the accounting information and bring other benefits to all involved.

First Nations peoples own and care for significant areas of land and sea in Australia, including 50% of Australia’s National Reserve System (<https://www.dcceew.gov.au/environment/land/nrs>). They are critical stakeholders in the active and successful management of Australia’s remaining intact ecosystems – as well as regeneration of partially-intact and/or impacted ecosystems – and should be meaningfully and appropriately engaged in the production of national ecosystem accounts to ensure that the full benefits of the accounting process might be realised by their communities. Additionally, First Nations people are driving engagements that deliver on their goals for Country, culture and community, including exploring economic opportunities and partnerships, founded on sustainable ecosystem management; these diversify their funding sources (Woodward et al. 2020).

Security of funding and increased resourcing is also critical to empowering people to get back to, and to look after, Country (Janke et al. 2022), and the ecosystem accounting process is another step in building pathways towards self-determination.



# 1 Introduction to the Regional Ecosystem Accounting Pilot projects

## 1.1 Background

In April 2018, Commonwealth, State and Territory Environment Ministers agreed to a Strategy for a national approach to environmental-economic accounting. The Strategy committed governments to apply the United Nations framework, the ‘System of Environmental-Economic Accounts’ (SEEA) to national accounts that address policy priorities.

The Strategy and Action Plan for a Common National Approach to Environmental Economic Accounting advocates an approach to account development that is driven by policy and decision-making needs. The Regional Ecosystem Accounting Pilot (REAP) projects (the ‘REAP projects’) delivered ecosystem accounts at sub-national scale that aim to:

- demonstrate value for policy and decision making, engage key stakeholders and increase demand for an ongoing program of ecosystem accounts
- contribute towards the longer-term goal of national ecosystem accounts by testing methods that can be scaled nationally and by increasing capacity for ecosystem accounting in Commonwealth institutions.

The REAP projects were informed by experience gained in delivery of the National Land Account and pilot ecosystem accounts for Geopraphe Marine Park and Gunbower-Koondrook-Perricoota (links to CSIRO-led outputs are available at: <https://www.csiro.au/en/research/natural-environment/natural-resources/Natural-capital-accounting/Murray-Darling>).

The REAP projects applied the United Nations (UN) System of Environmental-Economic Accounting (SEEA) and UN System of National Accounts (SNA) frameworks and standards where relevant. However, in some cases, the REAP projects departed from, or extended, the frameworks.

Two REAP projects were undertaken, both being pilot studies (Figure 1):

- Project 1: Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes
- Project 2: Ecosystem Accounts for the Murray-Darling Basin.

The REAP projects delivered datasets and a coherent set of accounts for ecosystem extent and condition; biodiversity; and ecosystem services (in physical and monetary units) as visually presented in Figure 2.

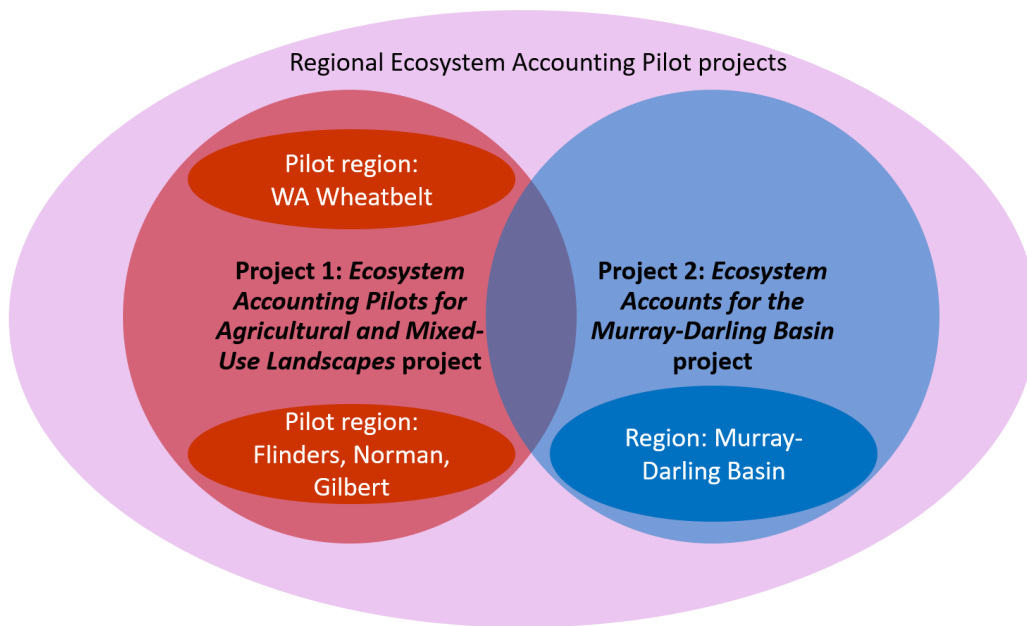


Figure 1 Projects and regions

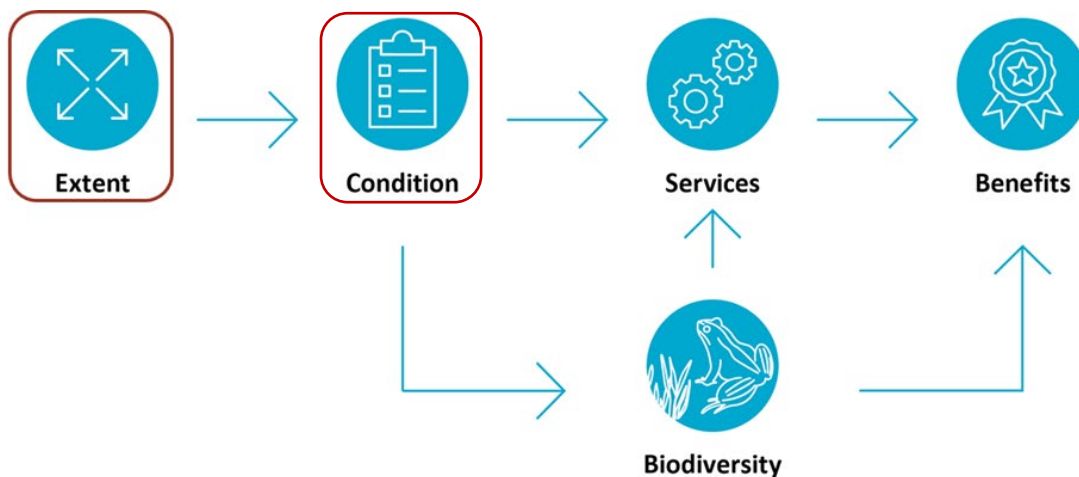


Figure 2 This project delivered datasets and a coherent set of accounts for ecosystem extent and condition; biodiversity; and ecosystem services (in physical and monetary terms)

The First Nations engagement focused on conceptual models supporting the assessment of ecosystem extent and ecosystem condition, enclosed by the red boxes.

This report reflects on key findings from First Nations engagement in REAP Project 1, *Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes* project, which required the team to deliver two regional ecosystem accounting pilots, for the Flinders, Norman and Gilbert river catchments in north Queensland, and for the Western Australian Wheatbelt. Pilot regions are shown in the map below (see Figure 3).

A key aspect of the REAP Project 1 was to develop and test conceptual ecosystem models in the context of First Nations engagement with these models, and whether they reflected a local First Nations understanding of ecosystems (Country), and where similarities and differences lay between the models and these perspectives. In the Flinders, Norman and Gilbert river catchments, CSIRO partnered with researchers from James Cook University (JCU) for this work.



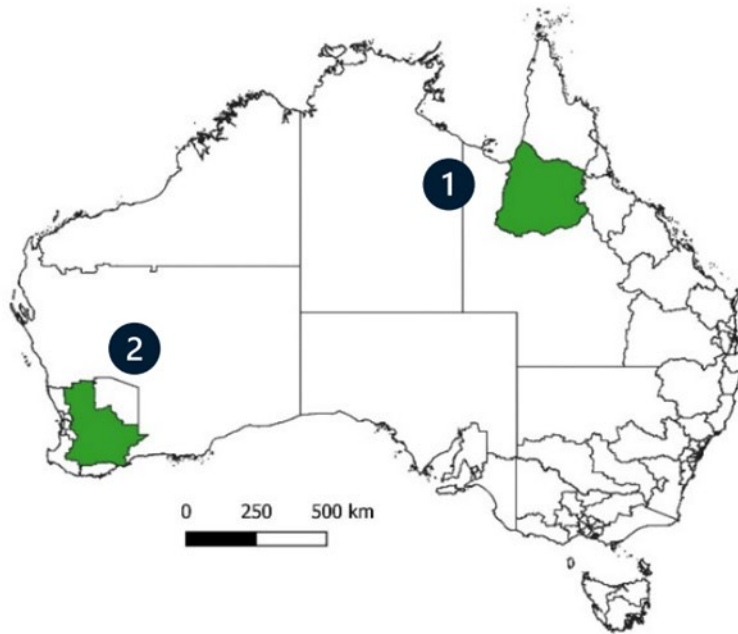


Figure 3 Location of pilot regions for the *Ecosystem Accounting Pilots for Agricultural and Mixed-Use Landscapes* project: (1) the Flinders, Norman and Gilbert river catchments (Queensland) and (2) the Western Australian Wheatbelt (Western Australia)

## 1.2 Conceptual ecosystem models

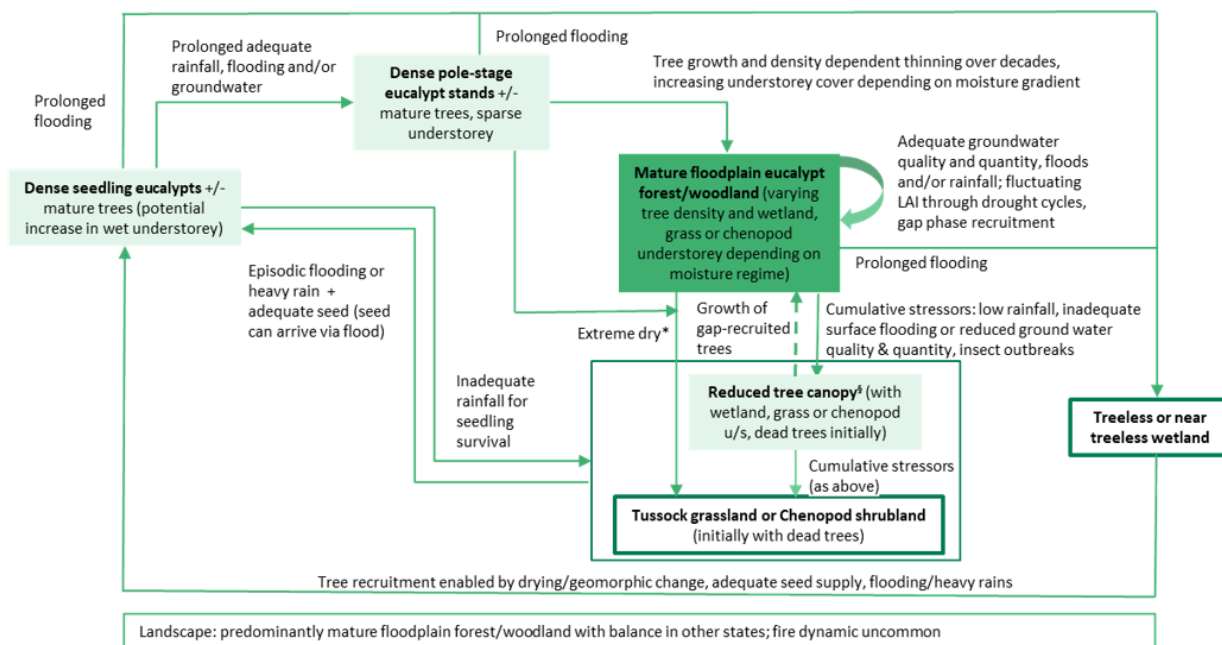
Through the two pilot regions (located in the Western Australian Wheatbelt; and Flinders, Norman and Gilbert river catchments respectively) the team built upon an existing national framework of dynamic conceptual models of ecosystems. This Australian Ecosystem Models (AusEcoModels) Framework (Richards et al. 2020) describes ecosystem states and reference conditions. The AusEcoModels Framework articulates an understanding of ecosystem dynamics under a set of endogenous or reference disturbance regimes (i.e. ‘natural’ events such as fires or floods) for different ecosystem types across the Australian continent. These ‘archetype’ models (see Figure 4 for example) serve as general templates for ecosystem types identified in an area of interest and are used as templates for the development of state and transition models. The ecosystem types in the AusEcoModels Framework are consistent with the reference classification in the SEEA Ecosystem Accounting (EA) framework (United Nations et al. 2021).

State and transition models (as described in the AusEcoModels Framework) consist of:

- reference states: ecosystem states in reference condition, defined as ‘the condition against which past, present and future ecosystem condition is compared to in order to measure relative change over time’ (United Nations et al. 2021)
- modified states: ecosystem states that are not in reference condition, due to exogenous disturbances (equivalent to ‘managed’ disturbances in the SEEA EA framework).

Both reference and modified ecosystem states are dynamic and are made up of ecosystem expressions, which are distinct, recognisable, but transient phases within ecosystem states. Sets of expressions capture all possible combinations of abiotic and biotic ecosystem characteristics, including ecosystem condition characteristics, of an ecosystem state.

The AusEcoModels Framework was used as the basis for quantification and mapping of a set of regional-scale reference and modified ecosystem states for the Western Australian Wheatbelt, and Flinders, Norman and Gilbert river catchments. Mapping the spatial extent of ecosystem states (both reference and modified) requires the development of a set of rules, captured in decision trees, for identifying ecosystem expressions and states using remotely sensed and on-ground data (Richards et al. 2021).



\*>century scale  
 †reduced canopy of large mature trees

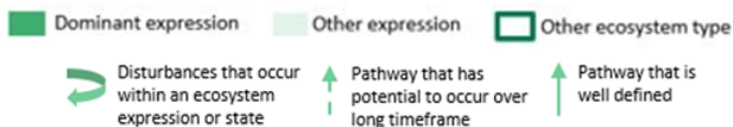


Figure 4 An archetype model example from the Australian Ecosystem Models Framework for ‘inland floodplain eucalypt woodlands and forests’, including ‘eucalyptus camaldulensis forest and woodland’, and ‘e. rudis’, ‘e. largiflorens’, ‘e. microcarpa’, ‘e. microtheca’, ‘e. coolabah’, ‘e. victrix woodlands’

Adapted from Prober et al. (in prep).

The following section of this report, section 2, provides further context for the report and outlines the project methodology; section 3 provides high-level learnings and recommendations from First Nations engagement applicable to future ecosystem accounting projects; and Sections 4 and 5 outline:

1. key findings and recommendations resulting from the engagement of Ewamian and Tagalaka peoples in the Queensland pilot region; and
2. an introduction to the Western Australian pilot region.

## 2 First Nations Engagement

### 2.1 Context

First Nations peoples own and care for significant areas of land and sea in Australia, including 50% of Australia's National Reserve System (<https://www.dcceew.gov.au/environment/land/nrs>). As critical managers of Australia's ecosystems, their meaningful and appropriate engagement in the production of national ecosystem accounts will facilitate realisation of the full benefits of the accounting process to Australia's First Nations people.

First Nations custodians of Country want to be involved in decision-making about Country, and have a right to be included. However, as was clearly expressed by leaders in the *Our Knowledge Our Way Guidelines*, for strong knowledge sharing partnerships to form between Government and First Nations people, including in the further development of national accounts, respect must first be demonstrated for traditional and contemporary First Nations knowledge (and knowledge sharing processes), culture (including cultural governance) and Country (respecting that First Nations people continue to face many challenges in exercising their Stewardship of Country, including and in particular, lack of access to land to practice customary activities) (Woodward et al. 2020).

Critical to understanding the role of First Nations peoples in the development of national ecosystem accounts is the fact that knowledge and understanding of Country, and the ecosystem benefits derived from Country, is place-based and highly localised to individual groups. Further, sharing of knowledge about Country is governed by cultural protocols and decision-making processes which are unique to each group, and underpin Aboriginal and Torres Strait Islander cultures.

Essentially, this means any First Nations engagement in the development of ecosystem accounts must be cognisant of allowing sufficient time to accommodate local governance and decision-making processes in order to respect and enable Aboriginal and Torres Strait Islander peoples' knowledge and culture. Such approaches support the Australian Government's intent in the Nature Positive Plan to 'work in partnership with First Nations to achieve better outcomes for people and communities and for Australia's heritage and environment', and ensuring 'First Nations' participation in improved management of Australia's land, fresh waters and sea' (DCCEEW 2022; p13), as well as delivering to aspects of the National Closing the Gap Agreement, whereby all activities are undertaken 'in a way that takes full account of, promotes, and does not diminish in any way, the cultures of Aboriginal and Torres Strait Islander people' (Commonwealth of Australia 2023).

### 2.2 Engagement overview

Following a thorough review process to identify the appropriate First Nations groups to engage with across the two pilot regions (including desktop searches of relevant websites such as the National Native Title Tribunal; Regional Land Councils, Regional Corporations, agricultural

initiatives and other First Nations organisations that seek to represent the interests of the First Nations people across their regions; plus consultation with trusted advisory organisations and people) CSIRO and JCU researchers contacted key potential First Nations project participants (organisations and individuals) by phone and/or email with initial project information.

Two specific opportunities for First Nations engagement in the project were presented. The first was via invitation to multi-stakeholder workshops held in each pilot region during the second half of 2022. While a number of First Nation groups and individuals were invited to participate in the workshops, the take up of the opportunity was limited. This appeared to be due to a lack of availability of the potential participants, likely combined with the relatively short notice that the project managers responsible for workshops were able to provide. Travel time from rural and remote locations may also have been a factor.

One advisory group, the North Queensland Land Council, attended the Queensland workshop, and wrote a report to the relevant First Nations groups within the Land Council area, informing them of the details of the workshop proceedings and discussions. This ensured the groups were fully briefed on the discussions relevant to their Country, even if they could not be there in person.

While only one First Nations individual, a Ballardong Noongar leader, was able to attend the WA workshop, his contributions to the workshop and later support for the project were significant. He provided additional cultural oversight to the methodology and roll-out of the project in Noongar boodja (Country).

Working within the project's capacity (time, budget and personnel), groups were engaged based on their ability to support two key workshop engagements in each of the pilot regions.

In Queensland, TAC and EL were targeted for engagement. In WA, the six endorsed Regional Corporations, were approached initially, as the peak bodies for Country management across the Noongar Nation.

Initial engagement experiences with the peak First Nations organisations across the two pilot regions were vastly different. While there was strong interest and engagement from TAC and EL in Queensland, engagement in the WA pilot region was more constrained. This was largely due to the emerging governance arrangements established as a result of the South West Native Title Settlement (negotiations finalised with the WA State Government in 2021). Over 2021–2023, the South West Aboriginal Land Council (SWALSC) has been transitioning from the peak body representing the six Regional Corporations representing the six consolidated Native Title claims (Yued, Ballardong, Whadjuk, Gnaala Karla Booja, South West Boojarah, and Wagyl Kaip Southern Noongar) to a Central Services provider. Concurrently, the existing six Regional Corporations and associated Indigenous Land Use Agreements (ILUA) have also been rethought as part of the formation and endorsement of six new and re-structured organisations (Yued, Ballardong, Whadjuk, Gnaala Karla Booja, Karri-Karrak, and Wagyl Kaip Southern Noongar Aboriginal Corporations).

## 2.3 Methodology

The project sought to respectfully engage First Nations representatives from each pilot region, establish a dialogue that made space for discussions, and where appropriate, document First

Nations knowledge and other contributions relevant to the development and critique of the existing (western-designed) ecosystem conceptual models.

This section briefly outlines the key methods of engagement in the Queensland and Western Australian pilot regions. A much deeper reflection on the engagement methods adopted in the Queensland pilot is discussed in section 3 as they underpin the key learnings.

It is important to note that whilst the project seeks to respectfully engage, the methodology for the pilot selection is as follows:

1. the decision to select these pilot regions (see Figure 3) was made without consulting the First Nations peoples of these areas
2. the regional boundaries used are based on a particular land boundary system that does not align with First Nations peoples' traditional or customary boundaries.

### **2.3.1 Approval from Human Ethics Research Committee for partnering with First Nations groups on this REAP project**

The First Nations engagement in REAP Project 1 was conducted in accordance with approval by CSIRO's Social Science Human Research Ethics Committee in accordance with the 2018 Australian National Statement on Ethical Conduct in Human Research (ethics clearance HREC 170/22 granted January 2023). The James Cook University Human Ethics Committee acknowledged this external approval and assigned reference number H8992 to this project.

### **2.3.2 Queensland pilot**

The research question posed by DCCEEW when initiating this project was: is the SEEA EA approach useful to First Nations people of Australia? To address this question two First Nations' workshops were held in Cairns, where the JCU researchers engaged with Board members of representative bodies for two First Nations peoples, Tagalaka people and Ewamian people. Both peoples have Native Title over their respective Countries, which are adjacent to each other, sharing a common border within the Gilbert river catchment. Tagalaka Country and Ewamian Country share flora and biophysical features, frequently described by ecologists as open savannah woodlands and grasslands. In the workshops with each group, the sequence of activities was important; specifically discussing the SEEA EA approach last so as not to influence the earlier discussions of how First Nations related to Country and how they monitored its health. The comparisons of concepts, priorities and approaches to monitoring Country between those adopted by each group and the SEEA EA approach provided for rich commentary by the Board members on how to improve SEEA EA so as to align with the First Nations ways of monitoring and caring for Country. In addition, by preceding SEEA EA discussion with the First Nations perspective of caring for and monitoring Country arguably avoids a SEEA EA framework bias. Comments from the Board members were captured by the Project team and are presented in Section 4. These results were synthesised into a coherent narrative that informed an infographic to convey the overarching important concepts described by the TAC and EL Board members. The validation of insights and infographics by each First Nations' group provided an obviously necessary level of robustness to what was being reported. Table 1 presents the key dates of engagement with the Boards of the TAC and EL.

**Table 1 Summary of engagement and participation by Tagalaka Aboriginal Corporation and Ewamian Ltd Board members**

<b>TIMELINE</b>	<b>TAGALAKA ABORIGINAL CORPORATION REPRESENTING TAGALAKA PEOPLES</b>	<b>EWAMIAN LTD REPRESENTING EWAMIAN PEOPLES</b>
<b>Initial reach out to Board regarding the REAP project</b>	31 August 2022	1 September 2022
<b>First presentation of the REAP project to Board members, to formally introduce project</b>	5 November 2022	14 December 2022
<b>Face to face workshop</b>	2 February 2023, Cairns	10 March 2023, Cairns
<b>Follow up online workshop</b>	16 March 2023	5 April 2023

### **2.3.3 Western Australian pilot**

The major restructure across the Noongar Nation as a result of the South West Native Title Settlement meant that the emerging Corporations were prioritising internal governance and strategic planning matters at the time of the project roll-out, and as such presented significant challenges for any external organisation/initiative to facilitate interest and/or meaningful engagement with them.

Advice on how best to navigate this restructure was provided by a senior and trusted Noongar colleague, the previously mentioned Ballardong leader, and a locally owned-and operated Noongar consultancy (Kooyar Wongi Pty Ltd) with expertise in First Nations community engagement and Natural Resource Management (NRM) for co-produced decision-making.

The key outcomes of this advice, to provide context for the challenges in engaging with the six organisations, included:

- a combination of the new governance arrangements and limited administrative capacity support for the emerging Boards of Management and Cultural Advisory Committees (CACs) for each of the six Corporations created complexity
- more immediate priorities related to new institutional arrangements associated with the reviewed and revised ILUAs for each of the six regions existed for key Noongar people
- many competing requests for endorsement, consultation, engagement on a range of projects, in particular in relation to cultural heritage management and protection
- the relatively short timeframes for engagement
- the six Boards of Directors and CACs sit about once per month and they may have a full agenda for a number of months before an opening exists to an external party (it is worth noting that this issue is common to First Nations organisations across the country, not just in Noongar Country)
- the lack of a co-design approach and clearly mutually beneficial outcomes from the research.

Given the above, it was not surprising that there were not strong engagement outcomes for the pilot in the south-west of WA.

This does provide for a number of key learnings to guide future research and engagement with First Nations partners, however, particularly in relation to Free, Prior and Informed Consent (FPIC) and allowing adequate lead time for relationship-building and project co-design.

Following this initial advice, Kooyar Wongi Pty Ltd was engaged by CSIRO in March 2023 to advise on a way forward for alternative and more targeted approaches to First Nations engagement, given the barriers experienced up until that time.

## 3 Key findings and recommendations for First Nations engagement

Section 3 outlines the key findings from engagement with First Nations groups in both pilot regions. The section opens with the conditions that enable effective engagement, before highlighting the disablers of engagement, to potentially avoid or address early in future ecosystem accounting-related projects. The section finishes with the key recommendations for future First Nations-targeted engagements in the development of ecosystem accounts.

### 3.1 Enablers of effective and respectful engagement

Some overarching findings, common to both pilot regions, are presented here as enablers in First Nations engagement on the ecosystem accounting pilot:

#### 3.1.1 On-Country engagements

When conducting research in partnership with First Nations groups, whether for ecosystem accounting research or for other purposes where the research involves Country (be that biophysical research or social research exploring topics such as connections to Country, activities on Country or benefits from Country), engagement should ideally be structured to allow the work to take place on Country: talking about Country should happen on Country. Further, providing on-Country data alongside remote data provides key opportunities for ground-truthing and exploration of any discrepancies. Unfortunately, limited time and budget constrained on-Country engagement in this project.

#### Leveraging of similar projects/initiatives for economies of scale

We recommend identifying ready opportunities to engage further with groups based on their own research interests and/or undertaking a co-design approach to deliver further or greater benefit to partners. This reduces time commitment for key project partners to be involved and reduces duplication of effort.

### 3.2 Disablers of engagement

The following section outlines the key disablers or barriers to First Nations engagement, as experienced through the ecosystem accounting pilots. Critical to project learning has been the experience of engaging with First Nations groups in the Wheatbelt pilot region, which has raised the importance of partners' early understanding of the context and dynamics of local governance arrangements as a critical component of research design.



### **3.2.1 Inadequate lead time for planning and co-designing**

Barriers include lack of time to undertake the project with First Nations group and individuals (i.e. to enable ethics approval; operating based on First Nations-led time frames and approaches) and an inappropriately short period of time to develop relationships to underpin safe knowledge sharing based on Free, Prior and Informed Consent.

This inadequate lead time was one of the key reasons that there were barriers to engagement with Noongar TOs and the broader Noongar community for the pilot in the south-west of WA. If project personnel had been aware of and able to plan for the change in governance for these key peak TO representative bodies across Noongar boodja (Country), and the potential implications for project timeframes (as described in detail in section 2.3.3), then an opportunity may have presented for an alternative approach.

### **3.2.2 Inadequate resourcing to facilitate meaningful and ongoing First Nations involvement**

Key barriers to engagement are lack of First Nations institutional or organisational capacity to facilitate community engagement and involvement in research, including no paid position to support research engagement; no point of contact identifiable/absence of nominated contact person for key organisations (no phone number; email address for newly established entities); and lack of contact details for key TOs and community members to invite them to be involved in the project.

Additionally, to enable full engagement, it is critical to provide funding for travel assistance, consultation fees and other costs to TOs and First Nations organisations in being involved in projects that are above and beyond what they consider to be their core business.

### **3.2.3 Lack of co-design approach**

Collaborations between government, scientists and First Nations groups should be based upon building true partnership arrangements, where First Nations peoples are empowered to lead work on their Country, as opposed to being consulted or invited to be involved as a part of work developed and led by other parties. This includes ensuring co-design for all project work, the inclusion of customary/traditional approaches to discussion and engagement, the incorporation of traditional ecological knowledge, respect for customary protocols and linking to traditional boundaries for catchment-based work.

## **3.3 First Nations feedback regarding the research engagement**

First Nations involved in the ecosystem accounting pilot project provided the following feedback in relation to the research process:

- The Ewamian Board members declared the importance of obtaining tangible feedback from Government given the effort put into the research engagement.
- While the research engagement was well-received, ideally more funding would have allowed for greater ability to 'get out on Country'. 'A longer project with better budgets' would have

enabled much richer responses to research questions, specifically, on-Country ground-truthing to visualise on paper to real life.

- In early research conversations with potential partners in the Wheatbelt region of the south-west of WA, scepticism was expressed about First Nations contributions to the project and whether it would result in any change to the process of developing national ecosystem accounts. This was underpinned by the fundamental concern expressed that the approach of ecosystem accounting, and quantification and monetisation of all aspects of the environment, does not align with the Noongar people's customary perspective of Country, and the general worldview that Country, including the contributions of nature as part of the cultural landscape, is invaluable.

### **3.3.1 Relationship building with First Nations people**

Trust and time were identified as key enabling factors in the project. Where project timeframes are highly constrained, there is often insufficient time to build trust with First Nations people to facilitate Free, Prior and Informed Consent for knowledge sharing, as was found here. Pre-existing relationships can reduce the lead time for delving into the research questions; however, these should not be relied upon. Additionally, First Nations engagement should be as inclusive as possible, to ensure a range of views are considered and, equally, cultural burnout in key TOs is avoided.

#### **Understanding of the geopolitical environment, institutional arrangements, cultural and governance protocols**

Existing understanding of the state of play regarding land ownership and management for a region, together with consideration of cultural governance arrangements, will facilitate an improvement in the engagement process with First Nations people. Engaging locally experienced team members, and/or locally engaged First Nations consultants, can provide a pathway for engagement otherwise unavailable.

## **3.4 Cross-pilot synergies**

The ecosystem accounting pilot identified the following cross-pilot findings:

- An inability to draw generalities across First Nations groups in terms of ability or desire to engage in the pilot project research process: interest and capability to engage varies across First Nations groups, which requires tailoring to the local context to ensure cultural protocols are respected and followed (as revealed by the differences in engagement between pilot regions).
- Capability to engage in ecosystem accounting related projects is key, and may require partner support (through adequate time frames and funding for people to engage in culturally appropriate decision-making processes).
- Sufficient time must be built into the project for initial phases of engagement: first, to ensure the 'right people' (organisations, representative bodies, sector representatives, advisors, TOs (including Elders and Rangers) and other First Nations individuals are recognised and engaged in the process). Also, sufficient time should be allowed for sharing information about the project

and building trust through ongoing and transparent engagement feedback loops and a project management approach focused on a cycle of continuous improvement.

- At a minimum, Free, Prior and Informed Consent processes should be adhered to.

### 3.5 Recommendations for the development of future national ecosystem accounts

These recommendations have emerged from the engagement with First Nations groups as part of this project, either emerging directly from discussions with the First Nations Groups during face to face or follow up workshops, or emerging from the experiences of the researchers in seeking engagement with First Nations Groups for this project work.

#### 3.5.1 Engage with First Nations interests in ecosystem monitoring and management

The following recommendations have been made to guide engagement with First Nations partners in future ecosystem accounting-related projects:

- Research processes and timeframes must be employed that respect protocols around the sharing of traditional and contemporary First Nations knowledge, and adhere to timeframes that support good governance, and appropriate decision-making processes. Co-design approaches often support attention to good knowledge sharing partnerships. These notions align with the importance of self-determination recognised in research and as expressed by EL and TAC, to avoid merely consulting with First Nations groups and instead have a proper co-designed research partnership.
- Ecosystem accounting-related engagements should be cognisant of, and designed in alignment with, existing related initiatives, plans and programs, (i.e. Indigenous Protected Areas (IPAs), Indigenous Land and Sea Management strategies, and many other formal programs). Questions which might usefully be asked in the design of any future First Nations-engaged ecosystem accounting projects include: How does the accounting for this project align with other current programs of management that First Nations partners are engaged in? Opportunities exist to improve these programs, build on effort, leverage off already achieved outcomes, reduce potential for duplication, and contribute to improved accounting information, by increasing coordination across programs and funding organisations.
- First Nations partners have expressed interest in the economic opportunities that might arise from ecosystem accounting, including engagement in biodiversity markets through a cultural landscape lens. Co-determining tangible benefits to First Nations peoples in the development of ecosystem accounts will underpin productive partnerships and engagements, and support good outcomes from ecosystem accounting for First Nations peoples. This might include considering the interaction between the environment, Aboriginal cultural heritage and community and how this intersects with Western concepts of economic value.
- Working with First Nations people, alongside scientists, industry representatives and other partners, improves the quality of the accounting information and brings other benefits to all involved, as described by TAC key recommendation below:

*Twenty years of satellite imagery used as the primary source material for inferring health of environment. The Tagalaka Native Title area is a significant size of ~30,000 square kilometres. Tagalaka people strongly advocate for a partnership with the CSIRO to collaborate on measuring the health of the environment in a 20-year project in which:*

- *Tagalaka Rangers monitor and document the health of the environment*
- *30 individual square kilometre parcels of land across the Tagalaka Native Title area will be identified for monitoring and reporting*
- *CSIRO to provide training and equipment for key performance metrics to be measured including soil moisture levels, presence of animals, birds and insect like, etc.*
- *Monitoring and reporting to be conducted on a quarterly basis whereby providing an invaluable dataset used to validate the satellite imagery and environmental accounting model*

*The partnership will bring about many social and environmental benefits for both Tagalaka people and CSIRO.*

– Recommendation from Board of Tagalaka Aboriginal Corporation, provided by email 28 April 2023.

### **3.5.2 Enable opportunity for co-design approach**

Collaborations between government, scientists and First Nations groups should be based upon building true partnership arrangements, where First Nations peoples are empowered to lead work on their Country from project inception onwards, as opposed to being consulted or invited to be involved in a piece of work that has already been developed and led by other parties.

Fundamental to this is ensuring co-design for all project work, including ecosystem accounting projects like this one.

#### **Appropriate funding and timescales**

Projects need to be sufficiently funded and long term in nature to ensure that:

- everyone who should be involved can be (i.e. getting the ‘right’ people involved (see section 3.5.4 for more detail)). This may require adjusting engagement methodologies to ensure a range of approaches can be utilised. Including events in a number of different locations when working with geographically dispersed groups, one-on-one engagements where needed/preferred, visiting people at their homes, providing options to get involved in other ways.
- engagement, at least in part, takes place on Country. When talking about Country it should be undertaken on Country (as was made clear during discussions within both workshops in Queensland).
- sufficient time and funds are made available for draft project outputs to be presented to community members, for review and comment, to cross check and validate findings prior to finalization.
- information provided as part of building interest in the project should be sufficiently detailed to ensure that, in addition to deciding whether to participate, the group are also able to determine the most appropriate persons to be involved in the next phase(s) of work.
- scientific/GPS data collected can be ground-truthed by the right people (Section 3.5.4).

### **3.5.3 Respect First Nations decision-making, communication, traditional and contemporary knowledge sharing**

On-Country engagements to support First Nations land managers to show and demonstrate knowledge of ecosystems, including contextually specific understandings of states, threats, changes and management actions, is appropriate in the development of ecosystem accounts.

New ways of presenting data about Country, in particular incorporating a First Nations cultural lens on ecosystems within the development of accounts is required. Examples were provided of incorporating more tangible avenues for people to engage with the accounts, to draw a stronger connection between for example a one-dimensional satellite image, and the three-dimensional picture seen (and heard and smelled) from the ground.

### **3.5.4 Ensuring the 'right' people engaged**

To best meet the needs of the project and to comply with cultural obligations it is important that the 'right' people are in the room, with the appropriate knowledge and cultural authority to talk on the topic; who the 'right' people are is dependent on the context and the specific subject matter involved. The 'right' people may be Elders, Rangers, Board members, community members living in different locations, or a mix of these. Furthermore, it may be appropriate to involve males and/or females out of respect for traditional gender protocols, and also younger and/or older members, to aid succession planning and reduce potential for cultural burnout in senior people. Thus, each group needs to be free to determine who the appropriate individuals are to participate in the project to represent their people. Additionally, and importantly, they need to be provided with sufficient information on which to base their decisions.

### **3.5.5 Style of engagement**

#### **Relationship-building**

Recommendations for engaging with First Nations people, in particular when first establishing and developing the relationship, is that it is done verbally (preferably in person, by phone or online) rather than by email. It is vital that all engagement should be conducted in a respectful, transparent, and interactive manner on an ongoing basis. Project activities should be organised to facilitate two-way knowledge sharing. The engagements need to be about 'sharing and listening'.

#### **Mapping**

Developing maps of Country (and accounts) from satellite imagery only was seen as limiting by First Nations people consulted as it reinforces a one-dimensional view of the world that views Country only from above. It discounts the cultural landscape perspective, which is all about considering the interaction and intrinsic relationship between Country (the environment), culture, (cultural heritage values and connection to Country), and community. The traditional right and responsibility for First Nations people to care for their Country and be on their Country is connected to their mental and physical health – if Country is unhealthy, the people will be too and vice versa.

Satellite imagery does not take into consideration what cannot be seen at the landscape surface, including culturally important parts of Country like caves, waterways, sub-surface features of Country, rock art, burials, and of course as yet unmapped cultural values, etc.

Accordingly, to complete the one dimensional view provided by mapping Country with satellite imagery, it is recommended that this view is supplemented by data collected at ground level, providing data on the sights, the sounds and smells, and the culturally important sites that together provide a holistic ground view of the location; ideally such data would be collected by First Nations people as part of their caring for Country responsibilities.

## Modelling

Developing state and transition models by focusing on a sub-set of species (including a focus on trees to describe ecosystem types) is limiting as it does not consider the holistic ecosystem and how everything operates together and interacts with each other, including people. There is an absence of consideration of, inter alia, birds, animals, plants, people, rocks and rivers.

Regional ecosystem maps should be carefully presented for First Nations consideration and deliberation, and opportunities provided for First Nations peoples to ground truth the information presented within those maps.

### 3.5.6 Organisational research considerations

In determining what might constitute sufficient time frames for First Nations engagement in the development of ecosystem accounts, the requirements of Human Research Ethics clearances are a consideration. Research ethics committees commonly sit once per month to consider applications and require evidence of support from First Nations partners in the form of letters of support. This necessitates that some engagement has occurred prior to applying for ethics, in order to build some level of support for the research engagement. If there is not yet an established relationship with said First Nations representatives, it is highly unlikely that this can be facilitated.

Gaining consent is a gradual process that must be culturally informed by engaging with the community, group or individuals through processes such as community consultative meetings prior to the actual research starting. In some cases this might entail research presentations to First Nations organisations' Board of Directors who may sit once per month; and who may have a full agenda for a number of months before an opening exists for an external party to present.

Once a presentation has been made, an approach for a formal letter of support might be made, which can then be used to support the application to the Ethics Committee. It is uncommon for an application (to any Human Research Ethics Committee) to be approved following initial submission, and depending on the experience of the Committee and the ability of researchers to articulate all requirements in the application, it may take a further month or two to obtain ethical clearance, and therefore delay the green light to start the research proper.

The REAP project work provided some clear insights into ethical processes that could usefully inform future practice. These ethical considerations from undertaking this research included:

- providing clear guidance on what the kinds of information the research team was interested in talking about; how the information provided was to be adapted or used, and in what form it would be published; and how attribution of research contributions would occur

- working as far as possible (within constrained timeframes) according to the timelines that worked for Indigenous partners – in setting workshop dates, and allowing time for feedback on draft reports of information
- seeking feedback on infographics created to depict representations of Indigenous understanding of ecosystem function and ecosystem accounting
- providing opportunities for co-authorship of reports, and any future papers to partners
- engaging a First Nations research consultancy to facilitate the project
- determining arrangements for remuneration of Indigenous partners requires flexibility, and appreciation and respect for local norms and rates of payment.

The project was careful to allocate the same funds across the two pilot areas, and was able to negotiate rates of pay within those funding envelopes. Early and transparent conversations about the research budget were an important step in providing potential First Nations partners with all relevant information to enable informed decision-making in regards to engaging in the project.

## 4 Pilot region: Flinders, Norman and Gilbert river catchments

### 4.1 Introduction: project overview and partnerships

JCU members of the Project team partnered with First Nations representative bodies for two groups, the Tagalaka peoples and the Ewamian peoples of northern Queensland, in each case working with the Boards of their representative corporations, for this component of the research project. A limitation of this work is that it was designed by the JCU Project team members, rather than emerging from a co-design process between the Board members and the other members of the team; this issue is explored further within the recommendations section of this report. Given the limited time and scale of the project (a pilot project lasting less than nine months), the research team was restricted to reaching out to the Boards of RNTCs representing the Native Title holders within the region, rather than engaging the full range of other First Nations' governance structures.

For the Tagalaka peoples we worked in partnership with the Board of the Tagalaka Aboriginal Corporation<sup>1</sup> (TAC), and for the Ewamian peoples we worked with the Board of Ewamian Limited<sup>2</sup> (EL) on behalf of the Ewamian People Aboriginal Corporation (EPAC), the Prescribed Body Corporate (PBC). The JCU team comprised one female non-Aboriginal scientist (DJ) and one male Aboriginal scientist (DG), both economists.

A separate single-day workshop was held in Cairns with each of our partners. We sought to elicit their ways of assessing the health of Country and to share information about and gather participants' views on the Ecosystem Accounts' way of doing so. We also sought to describe the detailed western-science-based methods being used by the CSIRO to measure and account for the extent and condition of the ecosystems across the Flinders, Norman and Gilbert river catchments.

Follow up online workshops were held separately with Board members of each group to clarify any outstanding points and to enable our partners to check the synthesis of the information they had shared in the workshops accurately represented their perspectives. No information was shared beyond the Project team until after the follow-up workshops and subsequent to the approval of First Nations partners.

Details of the workshop discussions and findings are set out within each section, 4.2 and summary information on each partner organisation is provided.

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<sup>1</sup> For further information regarding Tagalaka Aboriginal Corporation, see <https://www.tagalaka.com/>

<sup>2</sup> For further information regarding Ewamian Ltd, see <https://www.ewamian.com.au>



### 4.1.1 Tagalaka people and Tagalaka Aboriginal Corporation

This project component focused on Tagalaka Country which is located within Queensland’s Gulf of Carpentaria savanna lands, falling within the Gilbert and Norman river catchments. Tagalaka Country falls across a number of local government areas but primarily is located within Croydon Shire Council with Croydon being the main population centre within Tagalaka Country. A map of Tagalaka Country is shown in Figure 5, and a view is provided in Figure 6.

*Connection with our ancestral lands, stories and practices is vital to our sense of belonging, peace of heart and overall wellbeing. Land is our beginning, our life and our ending place – it is as important as life itself to us.*

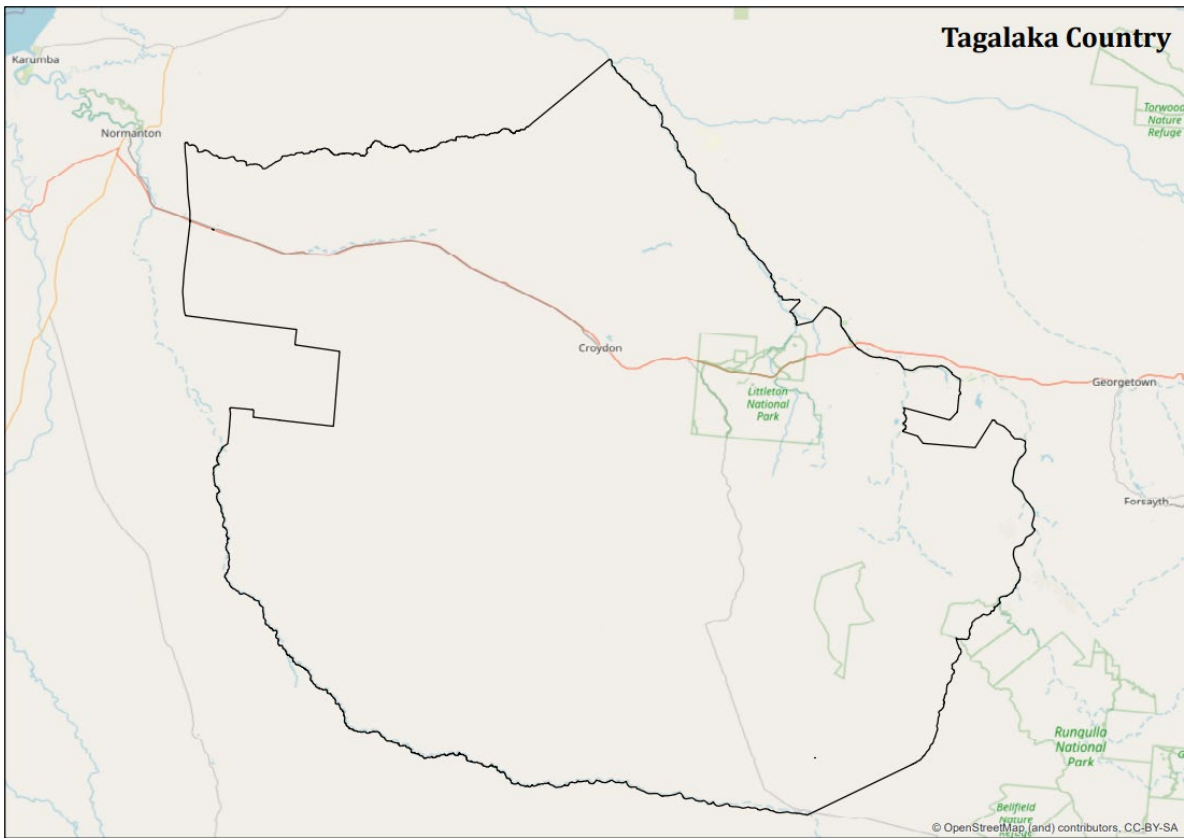
– Excerpt from Tagalaka Country Plan 2021–26 (TAC, 2021).

The Tagalaka peoples experienced the full violence of settler-coloniser expansion that facilitated the theft of their lands during the spread of European settlement across Queensland in the late 19th century, as the lands occupied and nurtured by the Tagalaka people were impacted by the spread of cattle stations and mining operations, and the influences of government policies (see for example Anti-Discrimination Commission Queensland 2017)<sup>3</sup>. The Tagalaka peoples were dispossessed of their lands, and significant numbers of Tagalaka peoples were forcibly removed and relocated to areas including Cherbourg, Woorabinda, Palm Island and Yarrabah. Others remained close to their traditional lands, gaining employment on the cattle stations across the region. Consequently, today Tagalaka people reside across Queensland and beyond, with fairly small numbers living on Country around Croydon or relatively close to their Country in Normanton.

The Tagalaka peoples’ application for Native Title rights was lodged in two sections in 1998 (for the area immediately around the settlement of Croydon) and in 2001 (for the much larger surrounding area). The applications were determined together by the Federal Court on 10<sup>th</sup> December 2012. The Native Title determinations recognise the Tagalaka peoples’ native title rights over an area of more than 29,000 square kilometres, and the Tagalaka Aboriginal Corporation RNTBC has been established to manage the Native Title rights on behalf of the Tagalaka peoples.

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<sup>3</sup> Derived from a range of sources including workshop discussions, YouTube videos shared by the Board, and general knowledge of Queensland history; and refined during discussions.



**Figure 5 Close up map of Tagalaka Country, within Queensland’s Gulf of Carpentaria**

Credit: Sana Khan (CSIRO 2023).



**Figure 6 Photograph of Tagalaka Country**

Credit: Jeanie Govan

The vision of the Tagalaka Aboriginal Corporation, provided by the Tagalaka Board in a follow up meeting, is:

*To be a stable and effective organisation, that works towards bringing Tagalaka people back to Country, through increased access to housing and employment and by creating opportunities to connect to culture.*

– Tagalaka Board, 16 March 2023

As such, the Tagalaka Aboriginal Corporation Board are seeking to provide cultural, social and economic benefits to Tagalaka peoples and to promote the management and caring for their Country, building upon the Native Title determination, in a number of different ways, two examples of which follow. Firstly, the Board are currently in negotiation with Queensland Parks and Wildlife Service (QPWS) seeking to agree a new Indigenous Land Use Agreement (ILUA) for Littleton National Park, which falls within the Tagalaka Native Title area. If agreed, the ILUA would provide for the cooperative management of the Park by Tagalaka Aboriginal Corporation and QPWS, providing a range of cultural, social and economic benefits for Tagalaka people. Secondly, the Board are in negotiations on possible carbon farming projects on Tagalaka Country whereby the TAC would work in partnership with the proponents to look after Country and provide economic benefits in the form of revenue and jobs. The Tagalaka Aboriginal Corporation also manages the Tagalaka Rangers program, which has been funded by the Queensland Government's Indigenous Land and Sea Program since 2018, having previously received funding from the Northern Gulf Natural Resource Management Group. Currently Tagalaka Rangers work with QPWS to care for Littleton National Park for a number of months each year; the Board are actively seeking to expand the area and time period over which the Tagalaka Rangers care for their Country in the future.

The Project team had not worked with the Board members of the Tagalaka Aboriginal Corporation previously, and thus had to reach out and begin to build a relationship with the Board and agree the research protocols for this work. This relationship was developed over a period of months, commencing August 2022, by a mix of telephone and email conversations between the Project team and the Chair of the Board, followed by an online presentation to the Board in November 2022. Following further discussions and Board deliberations, the Project team were delighted that the Tagalaka Aboriginal Corporation Board agreed to participate in this project. For further discussion of the engagement process, see section 4.5.1. To meet the desired objectives of the research end users, the researchers sought to explore the Tagalaka peoples' cultural connections to Country, to understand how the TAC measures (or would like to measure) the health of Country, and to explore whether there is a useful alignment between the Tagalaka perspective and the Ecosystem Accounting approach.

#### **4.1.2 Ewamian people and Ewamian Ltd**

The Board members of the corporate entities representing the Ewamian people were the second project partner from north Queensland. The Ewamian People Aboriginal Corporation RNTBC (EPAC) is the centre of the Ewamian corporate group of companies, and holds Native Title for Ewamian peoples. EPAC Board is also appointed as the Ewamian Ltd Board and acts as the Trustee of the Ewamian People's Charitable Trust. As the sole member of Ewamian Ltd, EPAC authorises all Ewamian Ltd activities and any spending from the Ewamian People's Charitable Trust. Ewamian

Ltd is a not-for-profit charity and the operational side of the Ewamian corporate group, providing administration, governance and corporate services on behalf of Ewamian peoples such as negotiating and managing agreements and employing staff to ensure ongoing sustainability of the corporate group.

The Country of the Ewamian people is also located in Queensland's Gulf of Carpentaria savannah lands, in the upper Gilbert and Einasleigh river catchments, and takes in the townships of Georgetown, Forsayth, Einasleigh and Mount Surprise. It primarily lies within the Etheridge Shire Local Government Area (Figure 7). A view of Ewamian Country is provided in Figure 9.

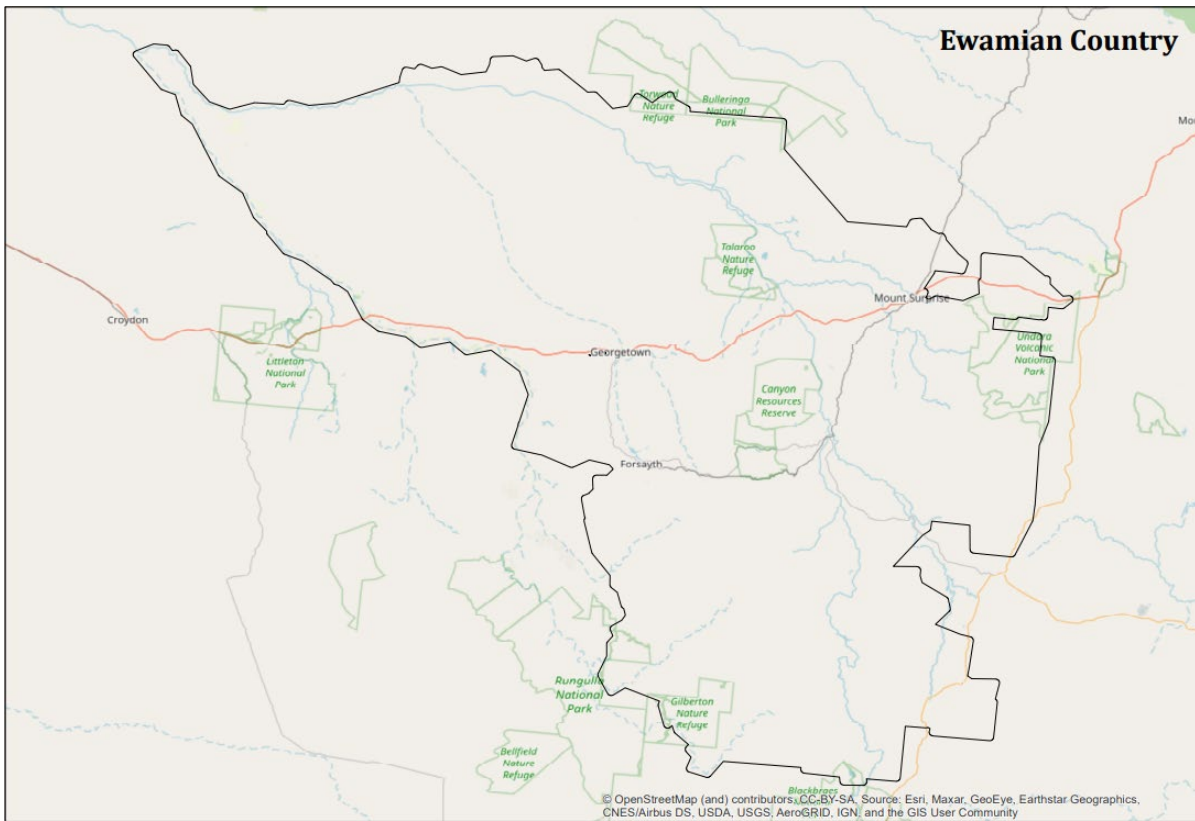
As discussed with the Ewamian people through a series of meetings, workshops and discussions, expansion of European settlement in the region in the late 19th century resulted in Ewamian peoples being subject to the influences of government policies and were dispossessed of their lands, affecting the continuous physical occupation of their ancestors. Significant numbers of Ewamian people were forcibly removed during the late 19th century, to areas including Palm Island and Mona Mona Mission in northern Queensland and to Cherbourg in southern Queensland. Others remained close to their traditional lands, gaining employment as stockmen and domestics on many stations for many years until the 1980s. However, today, few Ewamian people live on Country, instead residing in south-east Queensland, around Brisbane and Cherbourg, and in north-east Queensland, around Cairns, Mareeba and Kuranda as shown in Figure 8.

Ewamian Ltd (formally Ewamian Aboriginal Corporation (EAC)) was registered in 1994 to support an application for Native Title to obtain, hold and manage their land. Native Title over their traditional lands was determined for > 29,000 km<sup>2</sup> in 2013. In 2012, the Indigenous Land and Sea Corporation purchased Talaroo Station (315 km<sup>2</sup> of significant cultural and strategic value, including large areas of former pastoral lands) located largely on Ewamian traditional lands. Today, Ewamian Rangers are based at Talaroo and are funded through the Queensland Indigenous Land and Sea Ranger Program. EAC signed a lease with the Indigenous Land and Sea Corporation to manage Talaroo Station as an Indigenous Protected Area (IPA) with funding through the National Indigenous Australian's Agency (NIAA)<sup>4</sup>, and in 2014, Talaroo Station was also officially declared a Nature Refuge under the Queensland Governments' *Nature Conservation Act 1992*.

Since their Native Title Determination, the Board representing the Ewamian organisations have demonstrated a clear vision for the sustainable development of their community, and an understanding of what may be required to achieve it. This was evident when the Ewamian people voted in 2019 to convert the tenure of Talaroo Station to freehold to allow the EAC, now renamed Ewamian Ltd, to develop the Talaroo Hot Springs Tourism Project/Venture for their collective benefit.

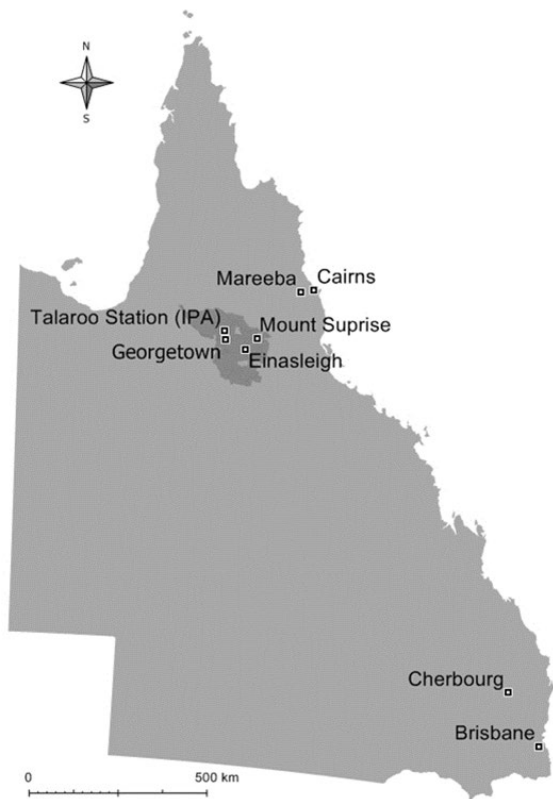
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<sup>4</sup> <https://www.dcceew.gov.au/environment/land/nrs>



**Figure 7 Close up map of Ewamian Country**

Credit: Sana Khan, CSIRO (pers. comm. 2023)



**Figure 8 The traditional lands of the Ewamian people are inland from Cairns, although they were forcibly removed from these lands during colonisation, with many Ewamian people now living in Brisbane, Cherbourg and in various towns in and around Cairns**

based upon Figure 2 in Larson et al. (2019)



**Figure 9 Ewamian Country**

Credit: Ewamian Ltd

To facilitate the effective management of the growing interests of the Ewamian people, a corporate restructure of the Ewamian entities was approved by the community in April 2021 to:

1. be more efficient to implement policies and operations
2. appropriately quarantine financial and real property assets from operational liabilities
3. optimise tax effectiveness.

In July 2021, the Talaroo Hot Springs opened for visitors, offering camp site accommodation, guided tours and access to the hot springs, and has successfully completed two tourist seasons to date. The Ewamian companies are ably led by their Board and their General Manager, with membership drawn from Ewamian people located in both Queensland's north and south-east. Their vision is:

*Sustainable economic, cultural, community and environmental outcomes for Ewamian people and Country.*

– Vision Statement from Ewamian Ltd Strategic Plan (Ewamian Ltd 2022, p. 6)

Given the long-term collaborative research partnership between the Ewamian Board and JCU members of the Project team, developed through two successful and collaborative previous projects (Addison et al. 2019; Jarvis et al. 2022; Jarvis et al. 2021; Larson et al. 2020; Larson et al. 2019; Stoeckl et al. 2019; Stoeckl et al. 2021), the team was delighted that the Board members expressed an interest in partnering with us again for this project. For further details on the engagement process, please see section 4.5.1. The work for this project built upon previous work

exploring cultural connections to Country, and how accounts developed using the System of Environmental Economic Accounting – Ecosystem Accounting (SEEA EA) framework might incorporate cultural values. Specifically, the current work sought to understand how the Ewamian people measure the health of Country and whether there is useful alignment with the SEEA EA approach.

## 4.2 Insights from workshops

This section describes the methodology for the project workshops and the insights gained from each of the workshops.

### 4.2.1 Tagalaka workshop

A one-day workshop was held with the Board members of the Tagalaka Aboriginal Corporation to understand Tagalaka perspectives on how health of Country is assessed and to consider whether SEEA EA is consistent with and useful to Tagalaka people's relationship with Country. An agenda of activities included exploring Tagalaka's worldviews of connection to Country, how Tagalaka people assesses the health of Country, and the Tagalaka evaluation of the SEEA EA approach.

#### Activity 1: Tagalaka worldview – Exploring cultural connections to Tagalaka Country

This session provided an insight into what Country means to Tagalaka people. What was important to Tagalaka and what Tagalaka do when on Country provides some knowledge on Tagalaka Connection to Country. Tagalaka Aboriginal Corporation Board members talked about the way in which they connected to Country and provided examples of activities undertaken on Country when making those connections. They wrote down key words/ideas on post-it notes (see Figure 10), which were subsequently grouped into 'themes' by the Board members and further discussed.

The Tagalaka Board considered a number of features to be important; these included:

*sacred sites [that is,] cave paintings, significant sites, fishing spots and swimming spots*  
– workshop participant, 2 February 2023

Concern was expressed by Tagalaka Board members with regards to sacred sites being impacted by bulldozing and cattle. Bushtucker (e.g. the endemic turtle, cat fish and bird life) was particularly important to Tagalaka and a theme that was repeatedly discussed in the workshop. In addition, the right way to burn and smoke on Country was also considered of significant importance. When Tagalaka people arrive on Country they demonstrate respect for Country at all times including their calling out to Elders.

The issue of access to Country was considered one of the greatest challenges in connecting and caring for Country.

*'Cattle stations [made access] difficult' whereas 'national park [access made it] easier [to access Country]'*  
– workshop participant, 2 February 2023

Under this banner of access difficulties, the barriers to being on Country were discussed and how these barriers impeded the revival of Tagalaka culture. In the current setting where Tagalaka

people are connecting back to Country after forced removal from it, the notion of ‘reviving’ of culture was considered by the Board as of immediate importance, given the loss of language and loss or damage to Tagalaka traditional cultural practices. However, not all tradition is lost, given traditional fire management practices are generating increased interest and being increasingly widely used across Australia, being promoted by its nationally recognised champion, Victor Steffensen, a Tagalaka man.



Figure 10 Post-it notes used to elicit key ideas used to build the Tagalaka mental model of cultural connections between Tagalaka peoples and their Country

The discussion and key ideas noted on post-it notes provided an insight into the mental model<sup>5</sup> of cultural connections between Tagalaka people and their Country. The greatest number of ideas noted by the Board members on post-it notes related to cultural and spiritual connections between people and Country, and these were described by the Board members as all falling under a general heading of ‘culture’. This grouping included activities that were carried out on Country and emotional/spiritual connections to Country and factors relating to cultural heritage and the history of the Tagalaka people. The second grouping relating to land and river species, and to bushtucker. After further discussion it emerged from the Board members deliberations that these concepts were in fact a subset of the ‘culture’ theme, rather than a separate grouping, as illustrated by the quotes below.

<sup>5</sup> Mental models are cognitive representations of external reality, used to provide the basis for how people act with and within the world around them (Jones et al. 2014).



*the animals are part of our culture too*  
– workshop participant, 2 February 2023

*I see them as part of my identity*  
– workshop participant, 2 February 2023

The third grouping described the impacts of the white settlement history on the region, reflecting the forced displacement of Tagalaka people from their lands as agricultural and mining developments spread across the region. This was captured by the phrase on one post-it note ‘displace from water for cattle’, and the ongoing use of the land by non-Tagalaka people was noted by, inter alia, the references to various cattle stations, mining and mine shafts.

*... we needed the river, we've got to be there ... we had to stay away from there because that's where they want their cattle*  
– workshop participant, 2 February 2023

*... cattle stations, feral pigs, feral cats, all impacts of colonisation. There were introduced species ...*  
– workshop participant, 2 February 2023

*At the moment, there's an issue around Gilbert Area with the yanga [long neck turtle]. The pigs go and dig them up in the dry season ... pigs are introduced species*  
– workshop participant, 2 February 2023

The ongoing problems of accessing Country, for cultural, leisure and land management purposes (despite Native Title) were described, on post-it notes and during discussion:

*... still feel sometimes people don't want you there, that is, pastoralists*  
– noted on post-it note by Board member during workshop, 2 February 2023

*... even though you're in the country, you still feel like some of the pastoralists don't like you there ... And I'll call that modern-day colonisation*  
– workshop participant, 2 February 2023

*... when we went back to Croydon for the 10-year anniversary, the non-Indigenous people and the vibe and the feeling, it feels so racist. So being equal on our own land is I think a huge thing ...*  
– workshop participant, 2 February 2023

The Project team summarised the grouping of concepts, by the Board members, that emerged from the post-it notes and discussion as follows:

1. culture, heritage, feelings, activities
2. land and river species, bushtucker (a subset of the first grouping)
3. barriers to being on Country, what others do on Tagalaka Country.

From discussions it was very clear that the mental model of the Tagalaka Aboriginal Corporation Board of their cultural connections to Country had a strong temporal element (being built upon the historical relationship between Tagalaka people and Country, and aspirations for the future), and was built upon a holistic and interconnected view of the relationship between nature (animals, plants, water, etc.), people and the wider community. To this end, the Tagalaka Country Plan (TAC 2021), prepared by the Tagalaka Aboriginal Corporation Board, provided a management approach akin to Ecosystem Accounting in the sense of management of ‘assets’ and (qualitative) scoring of importance (see Table 2).

Table 2 Assets of Country sourced from Tagalaka Country Plan (TAC 2021, p. 5)

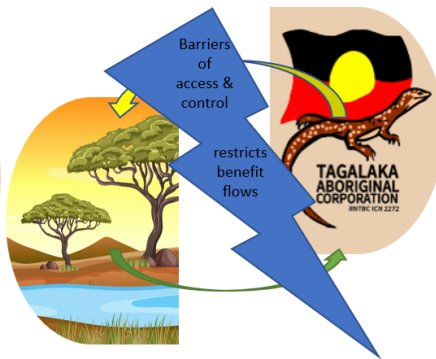
ASSET	IMPORTANCE	OUR GOAL
<b>Landscapes</b>	Diversity of Flora and Fauna Provider of Bush tucker Correct burning regimes Defines the relationship between the land and the community	To protect the flora of the landscape so our Country is healthy
<b>Water /Wetlands</b>	Aesthetic appearance Defines the relationship/connection to Country Food source	To protect, preserve and share our waterways and wetlands, in appropriate ways
<b>Community Wellbeing</b>	Spiritual health connects to our physical health and the health of our Country	To have healthy people and healthy Country
<b>Cultural sites and heritage</b>	Law basis of belonging, behaviour and values Record of people and stories Places of gathering and toil	To protect, preserve and share our cultural heritage and cultural sites in appropriate ways
<b>Wildlife (of Conservation / Cultural significance)</b>	Many family stories linked to wildlife, including about when and where to fish/hunt	To manage and maintain natural ecological balance

In a follow up meeting, an infographic of the evolution of ‘Tagalaka Connection to Country’ (initially drafted by the Project team based on discussions during the workshop) was discussed and refined by the Tagalaka Aboriginal Corporation Board members (see Figure 11 for the final agreed version). The Board confirmed this figure broadly captured the Tagalaka challenges across time and their vision to reduce barriers of access to Tagalaka Country in order to revive cultural connections. The ‘blockers’ shown in the infographic also feature strongly within the Tagalaka Country Plan (TAC 2021) where key threats to the Tagalaka assets (as described in Table 2) include ‘access to Country’, seen as a threat to all categories of assets and ‘incursion of pest plants and animals’ seen as a threat in four of the five categories of assets. These threats, alongside loss of cultural knowledge, lack of employment and risks of inappropriate development within the region, were identified by the Board as the most important, and thus, those requiring the most focus of the Board’s attention in their work.

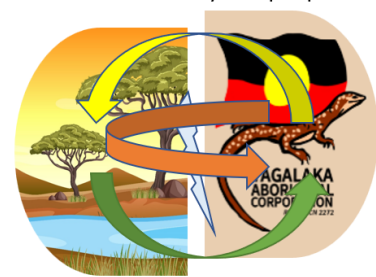
**How it was**  
 Tagalaka people and Country together, strong inseparable, reciprocal and sustainable benefit flows between people and Country



**How it became**  
 Barriers of access and control separate people and Country, reducing flows of benefits to people and to Country



**How it could be**  
 Aspiration of the Tagalaka Board is to work to reduce the barriers, and rebuild/strengthen the cultural connections to Country, and restore the interlinked flows of benefits between Country and people



Flow of benefits between people and nature (represented by yellow and green arrows):

- Protecting, monitoring, managing
  - native species, water, rivers
  - cultural sites (incl cave paintings)
- Cultural burning
- Controlling, monitoring, managing
  - weeds, invasive & feral species
- Bush tucker – fish, turtles, other foods
- Swimming, fishing, camping
- Spiritual connection, songlines, dreaming, stories
- Feeling of belonging, being home

Flow of benefits directly to people/society as a result of caring for Country (represented by orange arrow), e.g.:

- Sharing culture and practices
- Building capacity, developing skills & capabilities
- Facilitating housing, jobs, incomes
- Building partnerships

**Figure 11 Mental model of the cultural connections between Tagalaka peoples and Country, showing how this has evolved over time and aspirations for the future**

### Activity 2: Tagalaka worldview – Exploring measures for evaluating Healthy Country

In this part of the workshop, the Project team asked the Board members to describe how Tagalaka people evaluate the health of Country. A discussion ensued with the key points captured on butcher’s paper. Noteworthy, is the mix of affective (referring to the Board members’ feeling) and observational evidence (referring to what the Board members see) that underpinned the Board’s assessment of healthy Country. For example, ‘[Country] didn’t feel healthy’ (workshop participant, 2 February 2023) was a notion that was repeated by participants throughout this session. This is arguably reflective of the inseparability between the wellbeing of people and Country. Moreover, the concepts described by Board members that plants/animals/art are intertwined is reflective of a more holistic notion of evaluation when compared to the more reductionist view of Ecosystem Accounts. The presence of weeds and invasive species was considered by the Board to provide evidence of the decline in health of Country. In addition, fish stock decline and the decline in the previously plentiful agates were also markers of a negative impact on the health of Country.

*When I came back for the reunion, I had this feeling and I can’t put a finger on it, but I had a feeling that the land was sick ... I don’t know, but it didn’t feel like it was healthy*  
 – workshop participant, 2 February 2023

*You go on Littleton National Park, it’s a bit unhealthy, but it was healthy. It’s not as unhealthy as it was when there were cattle on there... You just see the change in scenery when you drive past all the cattle, the ground is just mashed up. And if you think about what history tells, the traditional yang was everywhere. When they introduced cattle, it depleted by 80%. Imagine turtle population being depleted by 80%*  
 – workshop participant, 2 February 2023

Post-colonial impacts in the form of ‘cattle destroy[ing] land and waterholes’, ‘feral pigs destroying land’, ‘stations [that] are bulldozing land and are looking [to plant] cotton’ (all examples quoted by workshop participants, 2 February 2023) were considered by the Board members to be a priority

for Tagalaka people. However, the difficulty to access land made it difficult to address these impacts and the particularly important need to ensure cave painting preservation.

*... there's sites of paintings that we don't even know exist because we haven't been allowed to go there. So even the pastoralists might know about it, but we don't know about it because we're not getting access to the land*  
 – workshop participant, 2 February 2023

Thus, this discussion frequently referred back to the key concepts and connections raised during activity 1.

A follow up workshop between the Project team and the Tagalaka Board members identified the Tagalaka approach to monitoring caring for Country and on Country activities, which provided more detail on the health of Country assets (see Table 3). This approach has aligning elements with the Ecosystem Accounting condition scoring (of fair, good, etc.) for different features within the ecosystem/Country.

**Table 3 Asset-Indicator-Status table – excerpt from Tagalaka Country Plan (TAC, 2021, p. 6)**

ASSET	INDICATOR	STATUS
<b>Landscapes</b>	<ul style="list-style-type: none"> <li>• Diversity of flora vegetation</li> <li>• Level of weed infestation</li> <li>• Landscape change</li> <li>• Level of appropriate fire regime</li> </ul>	Fair
<b>Water /Wetlands</b>	<ul style="list-style-type: none"> <li>• Wetland condition</li> <li>• Water quality</li> <li>• Landscape change</li> </ul>	Good
<b>Community Wellbeing</b>	<ul style="list-style-type: none"> <li>• Number of Tagalaka people employed</li> <li>• Number of Tagalaka projects funded</li> <li>• Level of community visits on Country</li> <li>• Number of Tagalaka people participating on Country</li> <li>• Community satisfaction</li> <li>• Number of community events</li> </ul>	Fair
<b>Cultural sites and heritage</b>	<ul style="list-style-type: none"> <li>• Sites monitored and maintained</li> <li>• Site condition</li> <li>• No of site visitations</li> <li>• Level of intergenerational knowledge sharing on Country</li> </ul>	Fair
<b>Wildlife (of Conservation /Cultural significance)</b>	<ul style="list-style-type: none"> <li>• Abundance of wildlife</li> <li>• Diversity of wildlife</li> <li>• Level of feral animal control</li> </ul>	Fair

When discussing actions that could be taken to monitor and manage the health of Country, the Board were clear that they, on behalf of Tagalaka people, should be involved, or indeed, leading these actions.

*... to ensure we are the ones who are doing it and they're supporting us to do it as opposed to doing it and telling us about that it's our people who should be doing it*  
 – workshop participant, 2 February 2023

*... it should be Tagalaka people bringing the solutions to the land, and not being a bystander to it and observing someone else doing it*  
– workshop participant, 2 February 2023

*... there needs to be real long-term investment to enable us to go back to Country and pick up these jobs full-time. And so with that, comes the housing, the paid positions ...*  
– workshop participant, 2 February 2023

Furthermore, beyond directly monitoring Country health, it was also thought to be important to monitor access to Country, as an important enabler of both environmental and human wellbeing.

*... if you are talking about KPIs, it is, you know, could break it down into access requested versus access granted. But then the non-tangible stuff, is that just in terms of the feeling, do you feel welcome or do you feel like you have the right, because that's very different to asking for access and being granted access ...*  
– workshop participant, 2 February 2023

### **Activity 3: SEEA EA approach – Consideration of the CSIRO approach to assessing healthy Country using state and transition models**

The way SEEA EA can be applied to Country was presented by the researchers, with first impressions and reflections provided by the Tagalaka Aboriginal Corporation Board members. Specifically, JCU researchers asked Tagalaka Aboriginal Corporation Board members to consider the method developed by the CSIRO for the extent, state transition and condition scoring for this pilot project was considered. An example draft map showing the ecosystem states across Tagalaka Country (see Figure 12) and examples of reference state and modified ecosystem state and transition models were used to promote understanding and discussion (see Figure 13 and Figure 14).

Broadly, Tagalaka Board members thought the considered the notion of using satellite information to inform land management activity could be a benefit. However, this was premised by the qualification (as confirmed with the Board in the follow-up meeting) that ‘ongoing quarterly validation of satellite land imagery to give confidence to those using the imagery [via ground-truthing by Tagalaka Rangers]’ (online follow up workshop participant, 16<sup>th</sup> March 2023) was required. For example, ‘NE dark green [details reflecting a particular type of ground cover] on the map [were identified as] wrong and could be illegal clearing [land] activity’. In the workshop, Tagalaka participants expressed a desire for an ongoing continuous checking progress to check and validate the results from the CSIRO developed state and transition models. This was further emphasised in a follow up meeting where this checking would:

*benefit government and CSIRO by having two scientific approaches working together [as is currently the case in fire management]*  
– workshop participant, 2 February 2023

and provide locally verified quantifiable and linked-to-place information.

*I think there's value in us seeing those and even testing ourselves to look at the maps and have our Rangers look at that and go, 'Is this an accurate representation or not?'*  
– workshop participant, 2 February 2023

In addition, the SEEA EA approach whilst ‘good [to] attempt’, ‘should not be [the] only tool’ and indeed should complement the ‘cultural (local) approach’ (quotes from workshop participants, 2

February 2023). The main takeaway expressed by Tagalaka people was to ‘not use [the SEEA EA extent state transition and scoring] in isolation.’

*... it's not a holistic picture of a healthy Country. But if you're just talking about trees alone and vegetation, I guess no issues with the model, but it's not a holistic view of a healthy Country*

– workshop participant, 2 February 2023

## Tagalaka Country Ecosystem States (in draft)

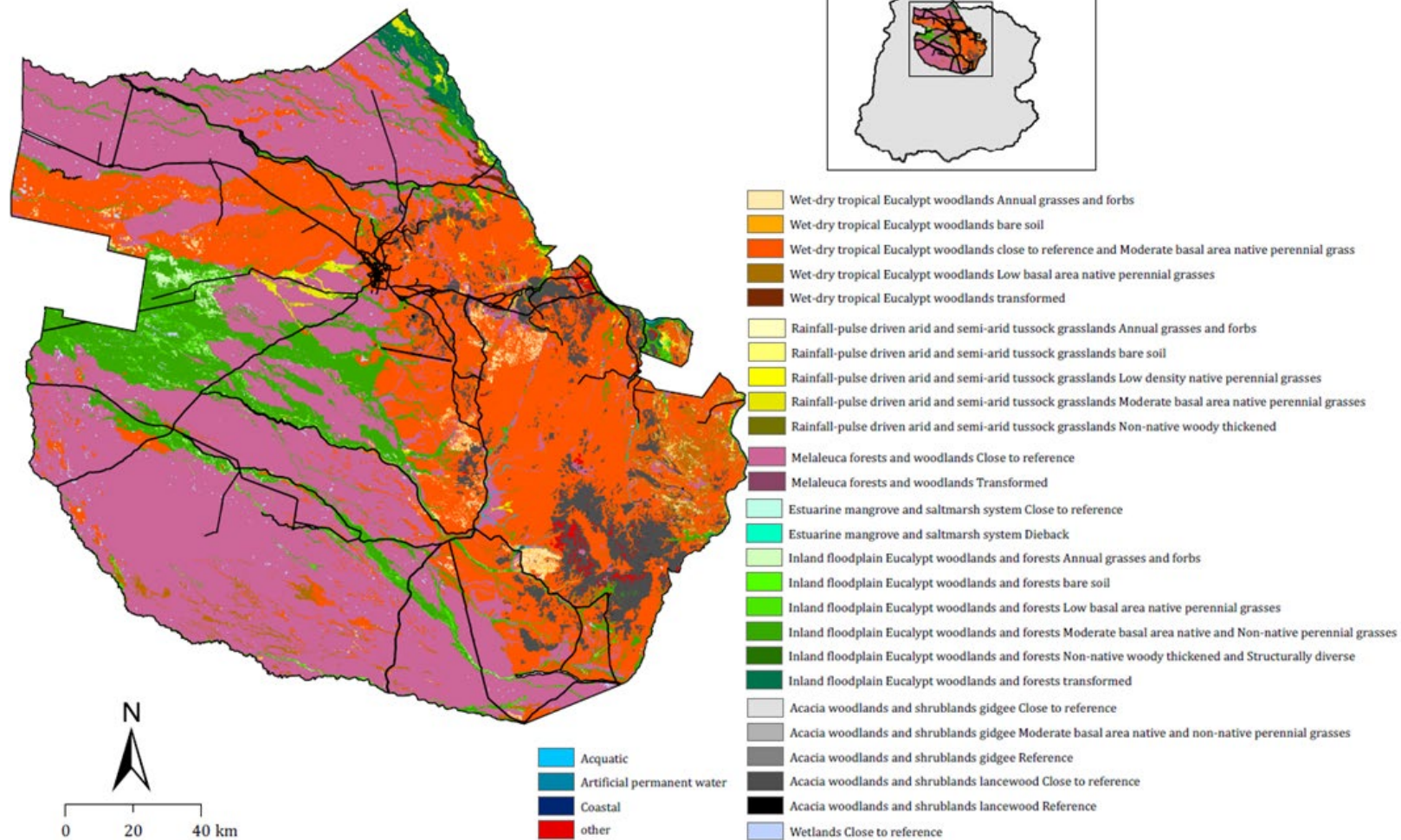
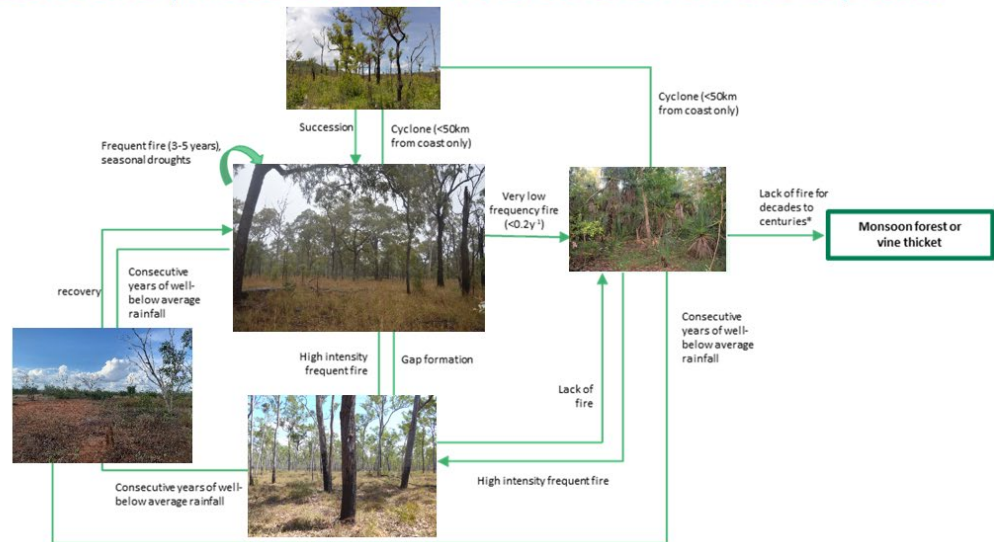


Figure 12 CSIRO draft map of ecosystem states across Tagalaka Country for this project which formed the basis of discussion for workshop activity 3

Credit: Sana Khan, CSIRO (pers. comm. 2023).

Reference state: Wet-dry Eucalypt woodland – photos show variability in this reference state. Some photos are from FNG, others from the top end.



\*Only occurs in ecotones where there is sufficient moisture

\*\*Common woody genera include *Eucalyptus*, *Acacia*, *Bauhinia*, *Terminalia*, *Grevillea*, *Carissa lanceolata* cover/ height of woody overstorey declines with increasing aridity



Figure 13 CSIRO example reference state diagram showing variability within reference state, used during discussions for workshop activity 3

### Wet-dry tropical eucalypt forests & woodlands: Modified Ecosystem states & transitions

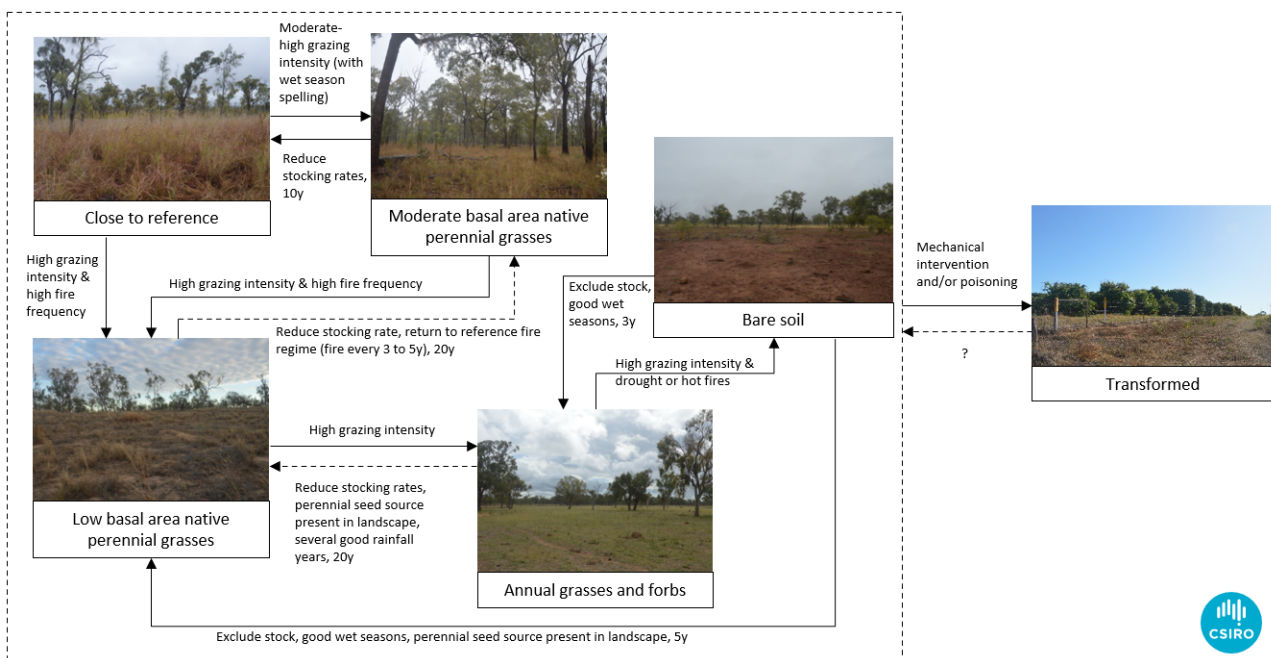


Figure 14 CSIRO example modified state and transition diagram for a typical vegetation type found on Tagalaka Country, used during discussions for workshop activity 3

A further important point was raised during the discussion of the state and transition models, as part of discussion of whether Country could be returned back to a healthy condition close to reference after having been heavily modified. It was felt that the transition back would not be easy:



*I think it's not just about removing the cattle, because the cattle probably would've killed everything*

– workshop participant, 2 February 2023

The Board members described how it was important to consider all aspects of Country and culture when considering the 'state' and how healthy it was, rather than focusing purely on the vegetation. That is, 'animals', water courses', and with highest priority, cultural sites such as the rock art, once modified/lost then there is no possibility of going back to reference.

*... with cultural site, like we talked about Rio Tinto the other day, they destroyed that cultural site ... you can't just say, 'Ah, we'll remove this mine from here and then it'll naturally go back.' No, they destroyed it forever*

– workshop participant, 2 February 2023

If such restoration were planned on Tagalaka Country then ideally Tagalaka people:

*Should lead it. Not [simply] be involved. Should lead it*

– workshop participant, 2 February 2023

The CSIRO-led approach to attaching a condition score to each different state was also discussed in detail; again Board members recommended, in the workshop, that these scores should be validated on the ground by the Tagalaka Rangers as part of an ongoing checking and validation process. Moreover, the Board members recommended a:

*pilot program in which Rangers added richness – for example by taking Tagalaka Country photos of reference [and other] states [to provide] a powerful click and see [interface] for users of the computer [based program]*

– online follow up workshop participant, 16 March 2023

which would provide the potential for:

*skewed scoring fixed by Rangers as they provided square kilometre tree counts [as well as other important local-level information]*

– online follow up workshop participant, 16 March 2023

*... you could use Tagalaka people to supply imagery to help them recalibrate their model*

– workshop participant, 2 February 2023

The Tagalaka Aboriginal Corporation Board thus recommended having two aligned approaches – Tagalaka-led on-ground, and CSIRO-led satellite based – for extent and condition data collection, bringing together two worldviews to provide richer and better quality reporting information. The Board were clear that both the Indigenous- and western-science-based approaches were important and both should be used to validate each other.

*I think this would be wonderful if you'd carved out square pieces of land as reference points, that people can verify on the ground, to match up with the satellite imagery, so you'd run them in parallel, right*

– workshop participant, 2 February 2023

Following the follow-up workshop and further discussions, the Board provided a brief recommendation for important additional work building on this pilot project. This recommendation, verbatim from the Board, is as follows:

*Twenty years of satellite imagery used as the primary source material for inferring health of environment. The Tagalaka Native Title area is a significant size of ~30,000 square kilometres. Tagalaka people strongly advocate for a partnership with the CSIRO to collaborate on measuring the health of the environment in a 20-year project in which:*

- *Tagalaka Rangers monitor and document the health of the environment*
- *30 individual square kilometre parcels of land across the Tagalaka Native Title area will be identified for monitoring and reporting*
- *CSIRO to provide training and equipment for key performance metrics to be measured including soil moisture levels, presence of animals, birds and insect like, etc.*
- *Monitoring and reporting to be conducted on a quarterly basis whereby providing an invaluable dataset used to validate the satellite imagery and environmental accounting model*

*The partnership will bring about many social and environmental benefits for both Tagalaka people and CSIRO*

– Tagalaka Aboriginal Corporation Board, by email 28 April 2023

### **Insight 1: Extent**

The Board recommend that Rangers were best placed to verify the SEEA EA satellite imagery. The use of Tagalaka Rangers was considered important as it ‘gives authority and purpose for ease of access on [Tagalaka Native Title recognised] Country’ (workshop participant, 2 February 2023). The satellite imagery was considered to require ‘[Tagalaka] Rangers [as the] team on [the] ground to verify [the imagery was providing correct information for decision makers]’ (workshop participant, 2 February 2023).

### **Insight 2: State and transitions**

The Board considered the state and transitions diagram as ‘ok but 1-dimensional thinking’ (workshop participant, 2 February 2023). ‘Touching soil [and] ground is important to see local specific features’ (workshop participant, 2 February 2023) that are considered important by Tagalaka. ‘Satellite imagery crosschecked by Rangers would be useful for [land] management [generally]’ (workshop participant, 2 February 2023). But, improvements recommended to the state and transitions diagram were to make clear ‘what is introduced and what is natural [particularly] in the [reference state satellite] photos’ (workshop participant, 2 February 2023). For the modified states and transitions, it was considered that it was ‘better to be prescriptive [and include important information including] about animals’ (workshop participant, 2 February 2023). Pertinent information that appeared absent included ‘natural disaster impact [in greater detail than those depicted in the CSIRO figures], water course [details], and hidden effects of [for example] mining and water quality’ (workshop participant, 2 February 2023). Ultimately, the Board expressed the view that cultural sites’ health is crucial and that Tagalaka should lead this monitoring and management exercise.

### **Insight 3: Condition scoring**

Condition scoring was considered by workshop participants to represent a common sense approach, however, caution was expressed that there could be danger in how these scores were used. The Board proposed that Tagalaka Rangers:

*should be involved in (a) condition scoring (b) [the resultant] land management response (c) checking wildlife numbers [as this was considered to be] independent of flora.*

– workshop participant, 2 February 2023

Improvements to the scoring approach was suggested by the Board members. Importantly, the score should be designed for Rangers as important users of the approach. Rangers were perceived as providing nuanced meaning alongside a score, for example, '[a score of] 8 might mean different things in different areas' (workshop participant, 2 February 2023). In short, it was considered important that animals and people should inform the score; something lacking from satellite-based condition scores alone. Ultimately, 'scoring [was considered] fine [when] made with local input' (workshop participant, 2 February 2023).

### Putting it all together: the infographic

The Board members articulated the importance of caring for Country, which is arguably lacking from the current SEEA EA approach, which is commonly interpreted as being highly linear (Figure 2).

Specifically, the Board members expressed a need to:

*... monitor Country [including, inter alia,] wetlands, weeds, pigs, health of soil, turtle, perch, trees and art sites*

– workshop participant, 2 February 2023

The Board expressed the view that these benefit flows to Country were pivotal for wellbeing benefits to the Tagalaka people:

*building capacity in Tagalaka people, housing, and jobs*

– workshop participant, 2 February 2023

*... importance to social and emotional wellbeing of Tagalaka of properly smoking, burning and managing Country*

– workshop participant, 2 February 2023

In addition, it was highlighted that:

*Tagalaka brought cultural expertise and employment opportunities [with examples] such as in the fire management work led by Victor Steffensen which aligns with Altman's [hybrid economy] concept*

– workshop participant, 2 February 2023

*Lack of access to Country is a threat that impacts all assets*

– Tagalaka Country Plan 2021–26 (TAC 2021, p. 9)

During the follow-up workshop and subsequent conversations between researchers and Board members, the ideas captured within the infographic (see Figure 18) emerged. Other ideas discussed included an alternate to the twisted braid, where instead there could be two smoke plumes seeking to represent the bringing together of the Boards's cultural spiritual knowledge and Western axiologies (study of the nature of value and valuation, and of the kinds of things that are valuable). Using twisted smoke or braid – which merge into one – illustrates this idea, and the text raises the access issues that can act as barriers impeding the merge. Improving Tagalaka peoples' access to Country (via aligned policy and funding), in these terms, can be seen as synonymous with enabling the benefit flows that were identified in the workshop.

Following discussions, the Board were happy for the developed infographic to be passed to professional graphic designers to make it look more attractive, as discussed in section 4.4. The Board members raised the idea that the infographic background should be a photograph of

Tagalaka people, culture and Country together, such as a photo of people engaging in a traditional smoking ceremony on Country.

#### **4.2.2 Ewamian workshop**

A one-day workshop was held with the Ewamian Ltd Board and General Manager to understand a First Nation perspective on how health of Country is assessed and to consider whether SEEA EA is consistent with, and indeed even useful to, Ewamian relationship with Country. An agenda of activities including exploring Ewamian's worldviews of connection to Country, how Ewamian assesses the health of Country, and the Ewamian evaluation of the SEEA EA approach was had. Seven members of the Board, plus the General Manager, participated in the workshop; with two participants residing in south-east Queensland and the remainder across northern Queensland including from around Mareeba, Cairns and Palm Island.

##### **Activity 1: Ewamian worldview – Exploring cultural connections to Ewamian Country**

*'I wanna know my Country, I wanna know my culture'*  
– workshop participant

This session provided an insight into what Country means to Ewamian. What was important to Ewamian about their Country provides some perspective on Ewamian connection to Country, and what aspects need to be monitored and protected. The Ewamian workshop participants were asked to talk about the way in which they connected to Country and to provide examples of activities undertaken on Country when making those 'connections'. They wrote down key words/ideas on post-it notes (see Figure 15), which were subsequently grouped into 'themes' and further discussed. This session also provided the opportunity for new Ewamian Ltd Board members to review the Board's previous work in relation to cultural connections to Country which had elicited a mental model of the Ewamian cultural connections to Country (Figure 16). Board members familiar with the previous work recalled the previous work, which allowed for a fruitful discussion that culminated in agreement by all the Board to the previous work.



Things considered important (from the post-it notes and related discussions) were divided by the Board into four groups which were key components of their mental model, inseparable from Country and culture: including: animals (with examples including native bees, dingoes, reptiles), plant life (including native flowers, trees, grass), water related (springs, river systems, lakes), and cultural artefacts (cultural sites, rock art, hieroglyphics). All four groups were key components, inseparable from Country and culture.

Reflecting on Ewamian Ltd's progress to date towards achieving their aspirations for the future, the following points were also important:

- The Ewamian language rebirth (Wamin language), was considered an important enabler for Ewamian connection and returning to Country.
- The Queensland Parks and Wildlife Services (QPWS) and Etheridge Council (ESC) relationships were considered important to the Ewamian Ranger operations of managing natural and cultural values on Ewamian country
- Community engagement with particular attention to 'Pastoralist walls coming down' (workshop participant, 10 March 2023) was perceived as catalysed by the buoyant and positively reviewed Ewamian tourism operations.
- Employing the right mix of Indigenous and non-Indigenous workers for the Talaroo tourism operation. The Board described how whilst Indigenous employment was the ultimate goal, the reality of importing skills via non-Indigenous employees with an intention to skills transfer to Ewamian employees was a workable path. The recruitment of a Ewamian Ranger coordinator following the restructure of the program and development of a new five-year Fire, Weeds and Feral Animal Management Plan was considered important for the future success of the program.

The new Ewamian Ltd Strategic Plan was a highlight alongside the Ewamian belonging goals of:

*knowing who I am, what is on Country, where [I am] from, where [I] belong, [I] can go back [to my Country] when [I] want*

– workshop participant, 10 March 2023

Ewamian aspirations, formally captured within six groupings in the Ewamian Ltd Strategic Plan, are highlighted in Table 4.

Table 4 Aspiration of Ewamian

TALAROO HOT SPRINGS	ENVIRONMENTAL MANAGEMENT ACROSS EWAMIAN COUNTRY	ECONOMIC DEVELOPMENT AND EMPLOYMENT OPPORTUNITIES FOR EWAMIAN PEOPLE
Continue building on tourism aspirations for economic and community benefit through the expansion of the Talaroo Hot Springs	Protecting and preserving natural values is important for Ewamian people and the Ewamian Rangers play a vital role in this.	Education and employment opportunities, particularly for young people, is key to increasing the skills and capacity of community members to meet the current and future needs of the organisation.
Communication and engagement	Management of Native Title Rights and Cultural Heritage	Ongoing sustainability of the organisation
Encouraging relationship building, establishing open lines of communication, establishing partnerships, enabling promotion and recognition of the achievements of Ewamian people by improving engagement mechanisms	Protect Native Title to ensure the best outcomes for Ewamian people underpins all that EL do. Preserving and promoting Ewamian culture to maintain connection to Country on Talaroo and the wider Ewamian estate.	Ensuring sustainable income streams, resources and staffing that will support the operations of the organisation.

Source: Ewamian Ltd strategic plan, (Ewamian Ltd 2022, p. 6)

### Activity 2: Ewamian worldview – Healthy Country

*Traditionally you'd go with your seasons*  
– workshop participant, 10 March 2023

The question of how Ewamian evaluates the health of Country was raised in this part of the workshop. A discussion ensued with the key points captured on butcher's paper. Important notions insights included:

*'go by seasons [to] burn at the right times'*  
*'bushtucker [and] how available it is'*  
– workshop participants, 10 March 2023

Operational practices can highlight indicators of Country health such as the presence of weeds: A reflection on current operational practices provided related insights that is, 'washing down to prevent the spread of weeds' (workshop participant, 10 March 2023). Given the current presence of 'weeds on Talaroo' (workshop participant, 10 March 2023) sees weeds as an indicator of Country health.

An instrumental approach of assessing health of Country was via 'Rangers [and] getting Indigenous people connected [to Country]' (workshop participant, 10 March 2023). GPS monitoring and surveys that identified location and habitat health of birds, insects and fish was considered an additional instrumental means of assessing Country health. These were considered a means to 'monitor cultural sites across [Ewamian] Country' (workshop participant, 10 March 2023) through 'photos [of Country]', monitoring of 'grass [health]', and field trips to 'Undara and the canyon' (quotes from workshop participants, 10 March 2023).

### Activity 3: SEEA EA approach – How CSIRO are thinking about healthy Country using state and transition models

*If you see something, you know, that satellite's picking up, then investigate more*  
– workshop participant, 10 March 2023

The way SEEA EA applies to Country was presented by the Project team with reflections provided by the Ewamian workshop participants. Specifically, the method developed by the CSIRO for the extent, state transition and condition scoring for this pilot project was considered. An example draft map showing the ecosystem states across Ewamian Country (see Figure 17) and examples of reference state and modified ecosystem state and transition models (as used for the Tagalaka workshop, see Figure 13 and Figure 14) were used to promote understanding and discussion.

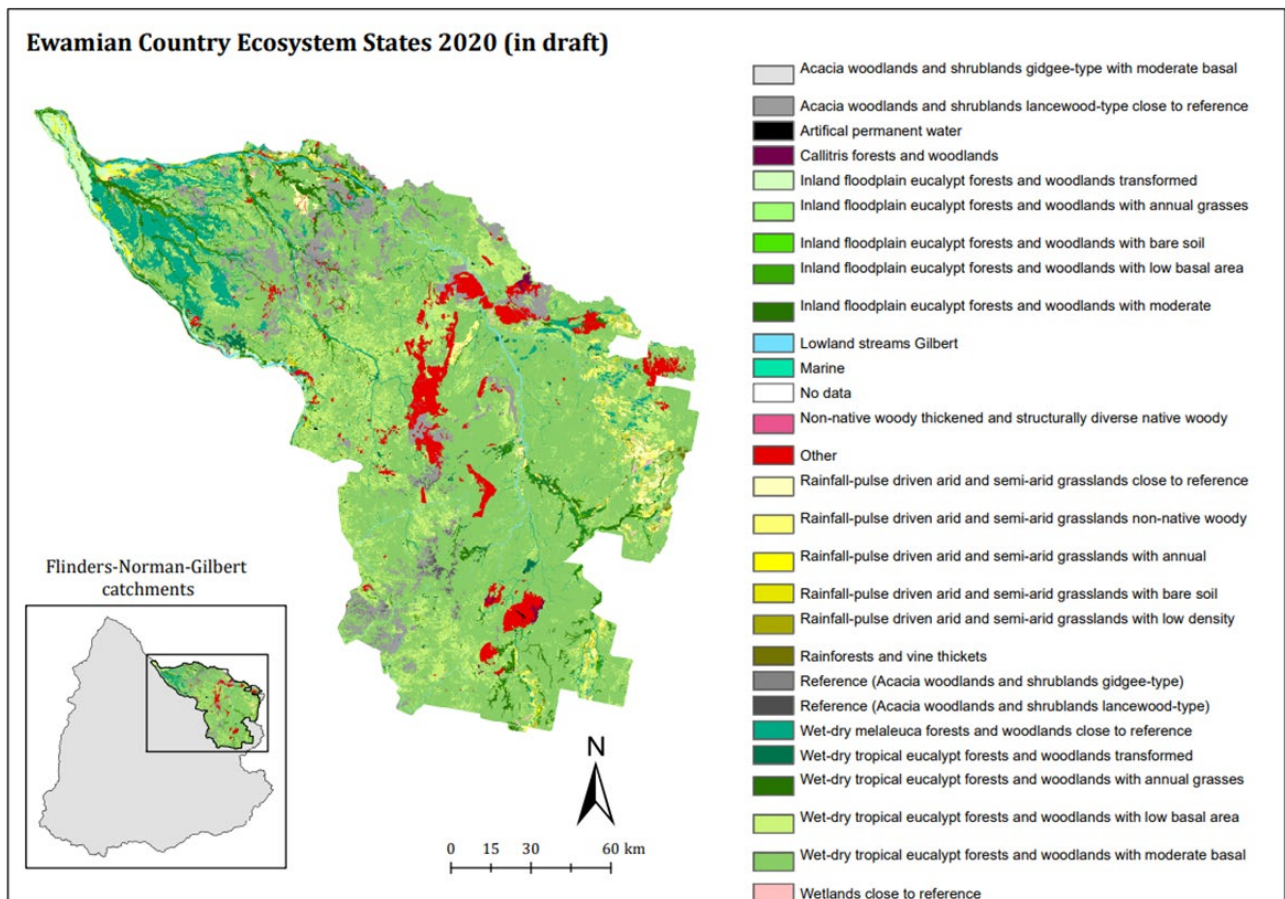


Figure 17 The CSIRO draft map of ecosystem states across Ewamian Country for this project which formed the basis of discussion for workshop activity 3

Credit: Sana Khan, CSIRO (pers. comm. 2023)

Broadly, the SEEA EA approach was considered appropriate with a few important qualifications. Ground-truthing of satellite imagery using local knowledge in Ewamian Rangers was considered crucial, especially when considering the health of Undara and waterways. Condition scoring depended on who was scoring and should at the very least incorporate all stakeholder views and therefore coordination. Finally, additional funding commensurate with the complexity of the task at hand was considered important. The following sections provides greater detail.

### Insight 1: Extent

*You need people walking around, riding horses, a hands on deck*  
 – workshop participant, 10 March 2023

Ewamian’s key message for extent account work was the to convey the importance of ‘ground-truthing’. For example:



*... hot springs [appeared to be] wrongly categorised [on the satellite maps]*  
– workshop participant, 10 March 2023

Other things may indeed be wrongly categorised and the view was that this should be resolved by simply:

*... getting out on Country by utilising [Ewamian] Rangers [in collaboration] with scientists [to incentivise the] sharing [of knowledge] both ways*  
– workshop participant, 10 March 2023

The Board saw a benefit in combining Ranger management plan maps and satellite imagery that latter of which was considered reliable to a certain extent. Much was said on this point. An ‘aerial [view] doesn’t [always] get it right, for example, [the health of] dried hot springs’ (workshop participant, 10 March 2023). Traditional measures provides the much needed ‘hands on view [of Country]’ by ‘horse riding [or] walking around [on Country]’ (quotes from workshop participants, 10 March 2023). So, whilst the ‘helicopter view was a good start’ a ‘front view is required’ (quotes from workshop participants, 10 March 2023). The ‘aerial view [is prior] to investigating more’ (workshop participant, 10 March 2023), and asking the deeper questions of ‘why [has] vegetation, the sound of water and bird droppings changed?’ (workshop participant, 10 March 2023) is part of this further investigation. Thus, to get the full picture it is important to have scientists/monitors, Rangers and Elders included, walking on Country.

### **Insight 2: State and transitions**

*... it's a good start, but the helicopter view isn't enough*  
– workshop participant, 10 March 2023

The Board drew into question the logic of the underlying assumptions of the state and transition diagram, for example:

*So, they're making the assumption that if you've got the right trees in the right condition [...] then everything else will be right*  
– workshop participant, 10 March 2023

*... but who controls the cattle [that have a significant impact on Country]?*  
– workshop participant, 10 March 2023

This then led to discussions of how transitions between states are in fact moderated by the nature of stakeholder cooperation and perceived threats of the state and transition diagram needed to be managed carefully, for example:

*explaining to the pastoralists to come on board in terms of we're not here to run your business or tell you how to run your business*  
– workshop participant, 10 March 2023

That is, whilst the state and transition diagram is presented in a positivist way it can be complicated by stakeholder interests – in short the transition probabilities are also a function of social networks, which is currently something not reflected in the state and transition model.

### **Insight 3: Condition scoring**

*while there's lots of trees and vegetation, you've got things like smell, and sounds, the satellites isn't gonna pick up*  
– workshop participant, 10 March 2023

Condition scoring was considered

*[requiring of] ground-truthing [to inform] scores*

– workshop participant, 10 March 2023

*'Stakeholder coordination [and involvement in condition scoring was required to take due account] of cattle management [impacts], [nuances] of pastoral lease [and expected activities]' with the ultimate aim to have functional 'partnerships and agreements [for] coordinated checks [underpinning condition scores]'*

– workshop participant, 10 March 2023

Scores were considered to be 'an ok approach [and indeed] fair' (workshop participant, 10 March 2023), but scores needed to be conditioned on their very use. That is, whilst numbering things makes sense, the scorer should be cognisant that 'scores are used to manage [activities on Country]' (workshop participant, 10 March 2023) and that the scorer is part of a process of data confirmation with score updating taking place through the process for ground-truthing of the data by Ewamian Rangers.

### Putting it all together: the infographic

Ewamian workshop participants highlighted the importance of caring for Country, which is arguably lacking from the current SEEA EA approach, commonly interpreted as being highly linear (as depicted in Figure 2). Specifically, the SEEA EA approach was seen as part of a larger land management exercise. Combining the helicopter view provided by the SEEA EA satellite maps with the maps already used by Ewamian Rangers was seen as advantageous to the immediate Ewamian Ltd caring for Country efforts.

*By utilising Rangers to confirm the [SEEA EA] helicopter view and working alongside scientists*

– workshop participant, 10 March 2023

... the satellite maps, which were considered to be reliable to a certain extent, could catalyse further knowledge sharing between Rangers and scientists. Given the doubts as to whether satellite imagery was 'telling you everything you needed to know' (workshop participant, 10 March 2023), Ewamian participants emphasised that 'ground-truthing was required' (workshop participant, 10 March 2023). This was seen as allowing a richer perspective when complementing the satellite imagery with important 'ground level scenery including sandstone, basalt, and granite' (workshop participant, 10 March 2023) features missed by using only satellite imagery.

Finally, access to Country issues were considered in terms of 'stakeholder coordination [through] partnerships and agreements with pastoralists and councils' (workshop participant, 10 March 2023). This coordination was already considered a positive spillover resulting from Talaroo tourism operation, but was considered central to the success of future land management activities as described in this workshop statement relating to access, land management and Ewamian's Tourism business:

*To look after Country it's important to build good relationships with pastoralists and shire councils. The walls are coming down as they see more people visiting*

– workshop participant, 10 March 2023

Notable, on the infographic at Figure 16 (resulting from reflections in the follow-up online meeting after the face to face workshop) is the weaving of two knowledge systems indicated by the twisted

braid, which represent Ewamian's Indigenous cultural spiritual knowledge and Western axiologies – which merge into one – with good engagement and partnership facilitate the merge, and access issues acting as barriers impeding the merge. Access to all of Ewamian Country, in these terms, can be seen as synonymous with enabling, via aligned policy and funding, the benefit flows that were identified in the workshop.

A key point in the infographic is the use of the twisted braid to try to represent the weaving together of Indigenous and non-Indigenous knowledge systems. A key message from the workshop discussions was that for good monitoring it was essential to use Rangers out on Country, with scientists also involved:

*By utilising Rangers to confirm the [SEEA EA] helicopter view and working alongside scientists*

– workshop participant, 10 March 2023

Such collaborations would promote knowledge sharing both ways and provide better quality information due to the Rangers checking and ground-truthing the information prepared by the scientists.

### 4.3 Comparison of insights from the Queensland pilot region

The comparison of insights drawn from the Tagalaka and Ewamian workshops are instructive.

Ground-truthing of satellite maps by locally based First Nations Rangers was considered crucial by the Board members of both Tagalaka Aboriginal Corporation and Ewamian Ltd. This would not only provide valuable nuanced local-level information to complement satellite data, but would endorse the real need to resolve the access to Country issues that both First Nations groups faced in management of land and cultural maintenance efforts. Specifically, information beyond the flora detail of satellite maps (considered insufficient and at times unrelated to animal, bushtucker and waterway health) could be provided in a partnership arrangement between scientists and First Nations to enable a blended flow of knowledge that would provide advantages in a similar manner to those seen in fire management. This would resolve the perceived one-dimensional approach of using satellite imagery alone. The related condition scoring was seen by Board members from both Ewamian Ltd and Tagalaka Aboriginal Corporation as endogenous to land management, that is, scoring was something for use and updating at the local Ranger level and hence should be customised for local Ranger land management use rather than be a terse exogenous score living in a distant computer model.

Co-design of future research work was considered an imperative by both groups. The sufficient allocation of time and money to ensure the right people and priorities were incorporated into works was considered a means to ensure meaningful collaborative research with First Nations partners takes place. These notions aligned with the importance of self-determination recognised in research and as expressed by the Boards of both groups, to avoid merely consulting with First Nations groups and instead have a proper co-designed research partnership. To these ends, the resolutions of access to Country barriers was articulated by both Boards as a precondition for successful future collaborative research and land management. Currently, stakeholder management with pastoralists and councils is considered a sensitive and important activity undertaken by both Boards. Given the strong recommendation from both Ewamian and Tagalaka

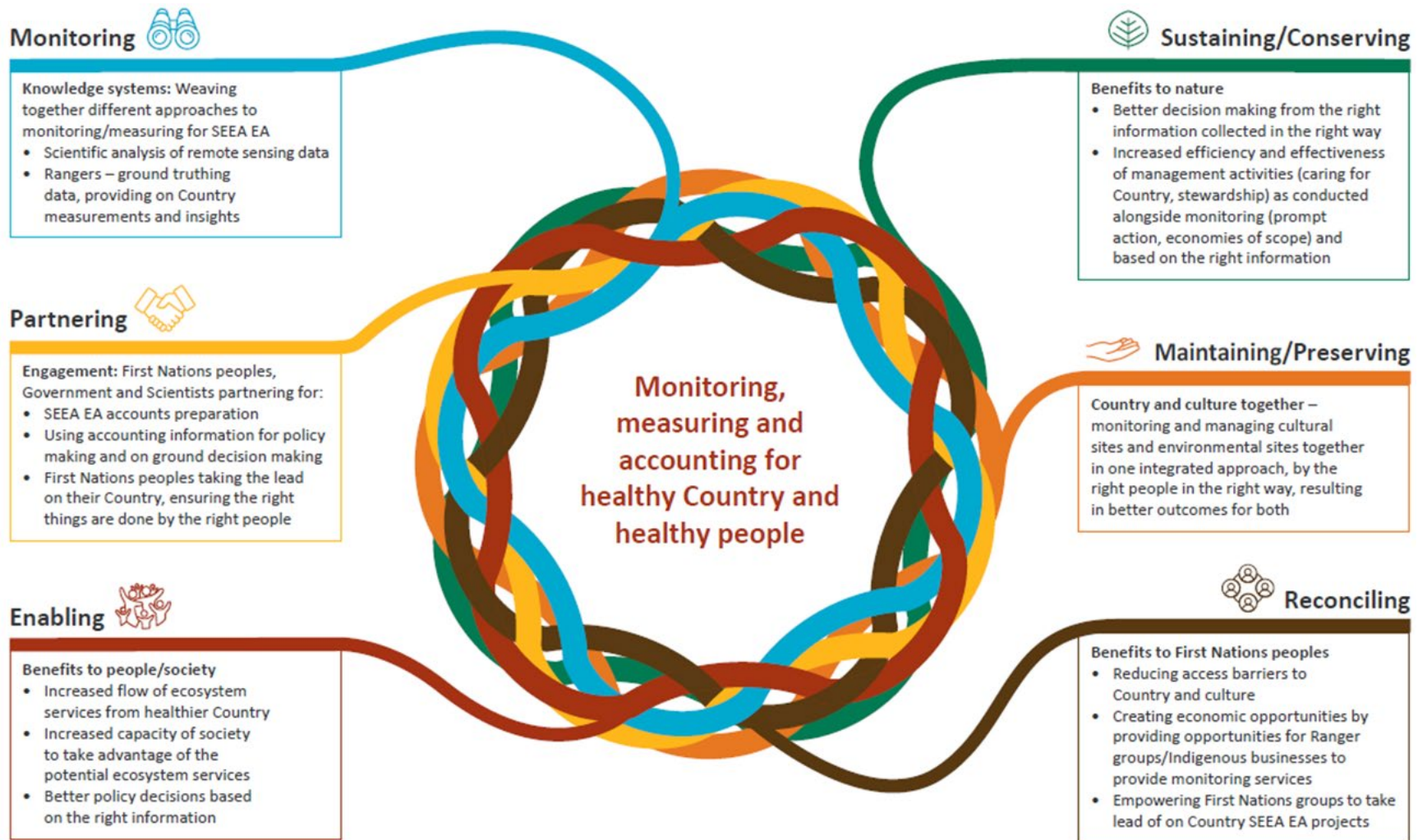
Board members that ground-truthing should be conducted by local rangers to validate satellite maps and update condition scores, a review of the conditions surrounding the current limitations to land access, and their reduction or removal, merits further consideration. Recognition by land managers and other stakeholders of the multiple benefits that rangers could deliver by performing ecosystem accounting related activities across diverse land tenures (including land not under their direct control, such as that used for agricultural and mining purposes) could assist with reducing these access barriers, and support a shift toward more diverse land management partnerships that facilitate access by traditional custodians to their lands.

#### 4.4 The final deliberated infographic

A diagram was constructed and validated by both groups following a deliberative process whereby an initial draft was amended, revised and improved by the Board members of both Tagalaka Aboriginal Corporation and Ewamian Ltd, reaching a draft infographic approved by both groups (see Figure 18). Following this approval, both groups agreed that the draft infographic could be passed to professional graphic designers to make it look more attractive. Whilst it was agreed that it may be nice to have a photo of Tagalaka and Ewamian people and/or Country as a background to improve the design, this idea was not progressed by the designers.

Two variants of the diagram were provided for improvement to graphic designers – that shown below (Figure 18). with arrows overlaid onto the braid with the six key words in them. The alternate version has those words embedded in the intertwined braid. In both cases the braid represents the desire to bring and weave together western science and Indigenous peoples and their knowledge systems to jointly deliver monitoring information and ecosystem accounts, and also deliver better outcomes for the environment and for people, in a sustainable and self-reinforcing manner. It was noted that the caption at the bottom of the page was the recommended caption if using the diagram as a figure, and was provided to help the graphic designers understand the thought processes underpinning the diagram. The graphic designers were also asked to consider the options of having photos as the back drop or whether it looks cleaner to have it as empty space, noting that if photos were used these should represent people and the environment together, not just a picture of the environment, and should represent both Ewamian and Tagalaka peoples and Country, thus perhaps should be a montage of photos from both groups.

Following a number of iterations, a final version of the infographic was developed by the graphic designers, and approved by both groups, as shown in Figure 18.



**Figure 18 Final agreed version of infographic**

The interweaved strands making the circle represent the weaving together of (1) knowledge systems for measuring (for SEEA EA accounting) and managing Country; (2) the holistic benefit flows between people and nature: summarised as (i) inseparable caring for Country and Country caring for people and (ii) inseparable ecosystem services and stewardship; and (3) how we recommend engagement between government, scientists and First Nations peoples should be conducted, with respectful collaboration and cross validation.

## 4.5 Engagement lessons from Queensland pilot region

*They need to have First Nations people in the room at the beginning*  
– workshop participant, 10 March 2023

### 4.5.1 Process adopted for engagement with First Nations groups for the Queensland pilot

The first step was for the Project team to identify the First Nations of the region, based upon previous knowledge and desktop searches of relevant websites such as the National Native Title Tribunal<sup>6</sup>, also the regional land councils and other organisations that seek to represent the interests of the Aboriginal and Torres Strait Islander groups across their regions. For the Flinders, Norman and Gilbert river catchments the relevant organisations were the North Queensland Land Council (NQLC)<sup>7</sup>, Carpentaria Land Council (CLCAC)<sup>8</sup> and Queensland South Native Title Services<sup>9</sup>. A google search was also conducted seeking to ensure that no relevant group was missed.

Having identified the relevant First Nations groups for the case study region, researchers then reached out by telephone seeking the appropriate people to talk to across the region, with follow up conversations being conducted by telephone and by email. The project one-page factsheet was also sent by email to all the organisations approached to provide them with further details.

The method for reaching out to First Nations across the region was varied based upon previous knowledge and experience of the researchers within the region, reflecting that different organisations prefer to be approached in different ways. For the section of the Flinders, Norman and Gilbert river catchments that is closer to the mouth of the rivers in the Gulf of Carpentaria, this region is serviced by the CLCAC for whom the accepted practice is that researchers should contact CLCAC who will then work with researchers to ensure appropriate collaboration with the First Nations groups whom they represent. For the upper stretches of the Flinders, Norman and Gilbert river catchments, the accepted practice is that researchers can either contact First Nations groups directly or work with NQLC to make contact, that is there is no requirement to work with NQLC. Accordingly, we reached out to CLCAC and to NQLC, and also reached out directly to those groups within the area serviced by the NQLC.

It is important to note that this stage of the REAP project work was not co-designed; essentially, the project was designed using a non-Indigenous research paradigm and representatives of Native Title holder First Nations groups were invited to participate. Future projects should seek the involvement of First Nations in a co-design process from the start.

The initial approach made to First Nations groups from the Project team to invite engagement with the REAP project was twofold, relating to two phases of the research project; the follow-up to each of these steps is described further in the sections below.

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<sup>6</sup> For further information see: <http://www.nntt.gov.au/nativetitleapplications/Pages/default.aspx>

<sup>7</sup> For further information see: <https://nqlc.com.au/>

<sup>8</sup> For further information see: <https://www.clcac.com.au/>

<sup>9</sup> For further information see: <https://qsnts.com.au/>

- Firstly, phase 1, to invite First Nations groups and Land Council representatives to attend a stakeholder workshop being organised by CSIRO as part of this project. This workshop, held in Townsville on 12 and 13 September 2022, sought to bring together stakeholders, Traditional Owners as the specialist knowledge holders for Country and scientific experts to elicit their help in developing ecosystem accounting systems that can inform restoration of natural capital, resilience of farms, and conservation of biodiversity. The workshop was entitled ‘Developing state and transition models to support ecosystem accounting of agricultural and mixed-use landscapes in the Flinders, Norman and Gilbert river catchments’.
- Secondly, phase 2, to invite First Nations groups to partner with CSIRO and JCU on this project, to create a separate dialogue enabling First Nations peoples to contribute to the conceptual models of different landscapes across their Country, and the drivers of change in that landscape, and provide their perspectives on the development of Ecosystem Accounts for their Country.

#### **4.5.2 Phase 1 – CSIRO workshop for stakeholders, First Nations peoples and scientific experts**

Whilst First Nations groups were offered the opportunity to participate in the workshop, few people were able to take up this opportunity. This appeared to be due to lack of availability on the potential participants, as illustrated by one response:

*... it really has been a very busy period for us lately and like a lot of other organisations, we are short staffed*  
 – extract from email correspondence with Ewamian Ltd, 23 September 2022

The lack of sufficient notice, in addition to time pressures, also contributed to the limited take up:

*... due to other commitments and the short notice we were not able to participate in the meeting in Townsville ...*  
 – extract from email correspondence with Carpentaria Land Council Aboriginal Corporation, 28 September 2022

The event was attended by a representative of one advisory group, NQLC. Their representative participated within the workshop itself, and also wrote a report to relevant First Nations groups informing them of the details of the workshop proceedings and discussions, ensuring the groups were fully briefed on the discussions relevant to their Country.

The invitation to attend had initially been accepted by one First Nations group, Tagalaka Aboriginal Corporation, whose Board members were keen to attend. However, unfortunately, unforeseen events prevented their attendance at the workshop.

#### **4.5.3 Phase 2 – partnership with First Nations to enable contribution of insights and perspectives to the REAP project**

In this section we discuss the partnership developed with each First Nations group separately.

##### **Tagalaka Aboriginal Corporation**

Following on from discussions relating to the potential attendance of Board members at the Townsville workshop, further conversations were held between the Project team and the Chair of Tagalaka Aboriginal Corporation regarding further engagement in the project. This resulted in Dr

Diane Jarvis being invited to present, and respond to questions, at a Board meeting, held online on 5<sup>th</sup> November 2022. Following Board deliberations, the Board agreed to partner with the Project team, and a provisional date for early February 2023 was set for a workshop.

The workshop was held on 2 February 2023 in Cairns at JCU premises, a mutually convenient location for the Project team and for the Tagalaka Aboriginal Corporation Board members. The activities during the workshop have been described in Section 4.2 above and will not be revisited here.

Towards the end of the workshop the Board members were asked to comment on how they had found the engagement process conducted with them as part of this project, and were asked if they had any guidance for researchers in future, or for Government seeking to engage with First Nations on these types of projects. Participants were also asked to complete a short, anonymous, workshop evaluation feedback form.

With regards to the engagement process, the Board were satisfied that the engagement had been conducted in a respectful and appropriate manner, and found the workshop both informative and enjoyable:

*From my perspective, the engagement with the corporation's been pretty good and very respectful and willing and open*

– workshop participant, 2 February 2023

*It's been a great workshop. I think I enjoyed that first activity and how the information was presented, and it was presented in a nice way*

– workshop participant, 2 February 2023

*Enjoyed the whole presentation/workshop. Facilitators were open and friendly. Lots of opportunities for participants to engage in dialogue/conversations. Activities was great! Lots of sharing and listening*

– response provided on workshop evaluation feedback form, to question 'what did you like about the whole workshop?', 2 February 2023

*Sticky notes activity – how information and stories were extracted out of Tagalaka people. How the facilitators presented information in an easy to understand way*

– response provided on workshop evaluation feedback form, to question 'what did you like about the whole workshop?', 2 February 2023

Other comments on the workshop evaluation feedback form supportive of our approach, to the question 'what did you like about the whole workshop?' included 'collaborative' and 'very open and receptive to discussion'. There were no responses provided to the question 'what didn't you like about the whole workshop?' beyond 'n/a' or 'nothing'.

The participants were also appreciative that their region had been selected as a case study site, and that they had been invited to be involved in this project:

*I think it's a privilege that we are one of the two pilot sites. I feel very privileged*

– workshop participant, 2 February 2023

One useful point of guidance for future workshops of this kind, made in response to being asked whether there was anything that had been missed or could have been done better, was that participants identified that it would have been useful to have more detailed information in advance with regards to the specific questions that would be asked of them during the workshop.



This would have enabled them to invite further participants who were better informed than the Board on some of the specific topics raised:

*but only the kind of questions we're going to be asking and the kind of information we'd like participants to have, so that we could select the right people to represent that subject matter*

– workshop participant, 2 February 2023

*Would've arranged the Rangers*

– workshop participant, 2 February 2023

*And the Elders*

– workshop participant, 2 February 2023

*Questions and knowledge required to enable us to provide the best resources for the subject*

– response provided on workshop evaluation feedback form, to question 'what could we do to improve the whole workshop?', 2 February 2023

*Funding and enough time to run a workshop in [Tagalaka] Community would be better than only the [Tagalaka] Board*

– response provided in a follow up online meeting after the workshop, when considering how engagement could be further improved, 18 March 2023

*The right [that is, Tagalaka] people sharing the report back to government is a good idea as well as sharing with [Tagalaka] Community members which we will do with Facebook this time*

– response provided in a follow up online meeting after the workshop when considering the use of the report, 18 March 2023

The follow-up meeting with the Board members confirmed this guidance, and emphasised the need for '... more time and funding for engagement'.

## **Ewamian Ltd**

Following on from discussions relating to the Townsville workshop, further conversations were held between the Project team and the General Manager of Ewamian Ltd regarding further engagement in the REAP project. These discussions benefited from the good relationship between the JCU members of the Project team and the Ewamian Ltd Board developed over previous research partnerships stretching back to 2015. These discussions resulted in Dr Diane Jarvis being invited to present, and respond to questions, at a meeting with the Chair and the General Manager, held at offices of Ewamian Ltd in Mareeba on 14<sup>th</sup> December 2022. Following this meeting, the proposal was placed on the agenda for the next Board meeting, to enable the full Board to deliberate on whether to participate. Following this Board meeting, the Board agreed to partner with the Project team, and a provisional date for early March 2023 was set for a workshop.

Towards the end of the workshop the Board members were asked to comment on how they had found the engagement process conducted with them as part of this project, and were asked if they had any guidance for researchers in future, or for Government seeking to engage with First Nations on these types of projects. Participants were also asked to complete a short, anonymous, workshop evaluation feedback form.

With regards to the engagement progress, the Board were satisfied that the engagement had been conducted in a respectful and appropriate manner, and found the workshop both informative and enjoyable.

The Board expressed that they were 'happy with the engagement' broadly and that it allowed for a 'good robust discussion' (quotes from workshop participants, 10 March 2023).

Whilst the researchers provided 'good articulation and explanation' (workshop participant, 10 March 2023) of the matter at hand, 'Regional ecosystem maps [needed to be] carefully presented for First Nations [consumption and deliberation]' (workshop participant, 10 March 2023).

Ideally, 'more funding to get out on Country' (workshop participant, 10 March 2023) would provide for richer responses in a 'longer project [with] better budgets' (workshop participant, 10 March 2023). Of significant importance is 'getting tangible feedback from Government given the effort [put into this exercise] by Ewamian' (workshop participant, 10 March 2023).

Other comments on the workshop evaluation feedback form were supportive of our approach: responses to question 'what did you like about the whole workshop?' included 'interactive', 'very informative', 'fun', 'Everything was done really well'. There were no responses provided to the question 'what didn't you like about the whole workshop?' beyond 'nothing', or 'liked everything'.

The participants were also appreciative that their region had been selected as a case study site, and that they had been invited to be involved in this project.

One useful point of guidance for future workshops of this kind, made in response to being asked whether there was anything that had been missed or could have been done better, was that participants identified:

*Better funding for these workshops to be put out on Country to exercise tasks. Visualise on paper to real life*

– response provided on workshop evaluation feedback from, to question 'what could we do to improve the whole workshop?', 10 March 2023

*Have out on Country, longer time frame, more funding*

– response provided on workshop evaluation feedback from, to question 'what could we do to improve the whole workshop?', 10 March 2023

# 5 Pilot region: Western Australian Wheatbelt

## 5.1 Introduction

The work being undertaken with the Noongar, the First Nations peoples of the Wheatbelt region of south-west WA, was still under way at the time of the publication of this report. As such, only early findings from First Nations engagement in the WA pilot region are presented at this time.

The intent of this section is to provide a high-level profile of Noongar people, the Traditional Owners of much of the Wheatbelt region, to ensure that they are recognised and acknowledged as interested partners and leaders in future ecosystem and biodiversity-related programs, and to provide some initial findings from the project that have informed development of section 3: Key findings and recommendations for First Nations engagement. Specifically, the emerging governance arrangements, as a result of the South West Native Title Settlement, has coincided with the short time frame of this project. This has limited the opportunities for full project engagement through the new six Regional Corporations, as their capacity and availability to be involved in non-core business projects/initiatives is extremely limited.

Advice on how best to navigate this restructure was provided by a senior and trusted Noongar colleague, a Ballardong Noongar leader, and a locally owned-and operated Noongar consultancy – Kooyar Wongi Pty Ltd – with expertise in First Nations community engagement and Natural Resource Management (NRM) for co-designed decision-making. The key outcomes of this advice to provide context for the challenges in engaging with the six organisations included:

- a combination of the new governance arrangements and limited administrative capacity support for the emerging Boards of Management and Cultural Advisory Committees (CACs) for each of the six Corporations made engagement complex
- more immediate priorities exist related to new institutional arrangements associated with the reviewed and revised ILUAs for each of the six regions
- many competing requests for endorsement, consultation, and engagement on a range of projects, in particular in relation to cultural heritage management and protection
- the relatively short timeframes for engagement
- the six Boards of Directors and CACs sit about once per month and they may have a full agenda for a number of months before an opening exists to an external party (it is worth noting that this issue is common to First Nations organisations across the country, not just in Noongar Country)
- the lack of a co-design approach and clearly mutually beneficial outcomes from the research.

Given the above, it was not surprising that there was not strong engagement outcomes for the pilot in the south-west of WA. Limited conversations with senior Noongar people to date have, however, revealed a degree of scepticism as to whether First Nations contributions to the project would result in any change to the process of developing national ecosystem accounts. These concerns will be explored further as conversations continue with Noongar people.

Further, there are many barriers to Noongar peoples contributing to ecosystem management and related decision-making as a direct result of colonisation and south-west land uses (privately owned farms, state forest, local government reserves, urban development, further population increase, etc.), in particular a lack of access to Country, a lack of ownership of land, lack of land management autonomy, and limited legal rights and responsibilities for the management of land and sea Country. The current situation is a result of colonial policies that led to Noongar dispossession, removal and marginalisation from Country, intergenerational trauma and inability to build intergenerational wealth (inclusive of land ownership). Regardless of these barriers, there are many examples of strong Noongar leadership in the regeneration and renewal of Country and culture, including through leading innovation in ecosystem services and resilient agricultural practices and industries.

## 5.2 Noongar peoples and Noongar Country in the Wheatbelt region

*It is understood that all lands and waters are culturally important to Noongar people regardless of its history, tenure or current condition*

– Ballardong Aboriginal Corporation, Cultural Advice Policy (South West Aboriginal Land and Sea Council, 2021, p. 4)

The Wheatbelt region covers 131,000 km<sup>2</sup> in the south-west corner of Australia and constitutes 6% of the state of Western Australia (DBCA 2021).

As a result of rapid and extensive agricultural development of the Wheatbelt from the early 1900s little natural vegetation remains and the landscape is now dominated by cropping and grazing agriculture and related production. The Wheatbelt is recognised as a highly fragmented landscape, whose remnant vegetation continues to decline as a result of ongoing clearing, altered hydrology and inappropriate fire regimes (DBCA 2021). Conservation reserves (predominantly on public Crown lands):

*hold the best repositories of biodiversity often within the largest and most intact remnants*

– DBCA (2021 p. 1).

Noongar people have held attachment to the south-west region of Western Australia for tens of thousands of years. Their culture connects them to Country, and engenders responsibilities to care for Country:

*We acknowledge, value, honour and respect our Noongar cultural protocols and practices. Our cultural protocols and practices designate us as the custodians of our Country, which means we have responsibilities to our Country that we need to meet. Our cultural protocols and practices endow and bestow us with values of respect and reverence for the land and waters and all that is in them.*

– Ballardong Aboriginal Corporation: Cultural Advice Policy (South West Aboriginal Land and Sea Council, 2021, p. 1)

Noongar culture is intrinsically linked with boodja (the land/Country) and customary activities such as hunting, fishing, camping, collecting bush tucker and medicine, and passing on of traditional ecological knowledge, all require access to natural areas (being on Country). Because of the lack of natural vegetation remaining in the Wheatbelt today, Noongar communities throughout the area hold strong cultural attachment to remnant native vegetation, waterways and lakes where they can reconnect with Country and practice customary activities. While these remnants are generally

small in size (from an ecosystem accounting perspective) and highly fragmented, these natural areas are of significantly high value in delivering social and cultural benefits.

Specific cultural heritage sites, which link Noongar cultural tradition to place, land and people across time, also hold great meaning and significance to Noongar people. Registered and recorded sites in the Wheatbelt region include those defined as artefacts/scatters, man-made structures and mythological sites (i.e. waterways), as well as historical, burial, ceremonial, painting and quarry sites. It is recognised that many sites are also water sources and/or camping, hunting or meeting places (DBCA 2021). Noongar people have a strong desire to care for Country (including regenerative management) and practice customary activities according to their traditional laws and customs, as well as recognise the economic potential that Country can deliver to support livelihoods.

### 5.3 Indigenous Land Use Agreements and new governance arrangements

Emerging governance arrangements have resulted from the South West Native Title Settlement (negotiations were finalised with the WA State Government in 2021). Over 2021–23, the South West Aboriginal Land and Sea Council (SWALSC) has been transitioning from the peak body representing the six Regional Corporations representing the six consolidated Native Title claims (Yued, Ballardong, Whadjuk, Gnaala Karla Booja, South West Boojarah, and Wagyl Kaip Southern Noongar) to a Central Services provider. Concurrently, the existing six Regional Corporations and associated Indigenous Land Use Agreements (ILUAs) have also been rethought as part of the formation and endorsement of six new and re-structured organisations (Yued, Ballardong, Whadjuk, Gnaala Karla Booja, Karri-Karrak, and Wagyl Kaip Southern Noongar Aboriginal Corporations). The six regional Noongar Corporations are the recognised governance bodies for all decision-making related to Country that is covered by the six respective ILUAs. These Regional Corporations were formally appointed in October and November 2022.

The functions of the Regional Corporations are to:

- benefit, advance and promote the six Noongar Agreement Groups
- manage and care for Cultural Land
- develop a Strategic Plan based on regional priorities
- develop key policies, for example, a Cultural Advice Policy to guide cultural decision making
- engage with government and relevant stakeholders to further Noongar community interests and priorities
- maintain, protect, promote and support their culture, customs, language and traditions
- manage and use the land and waters within the region to which they have a traditional connection
- manage their benefits and meet their obligations under the Settlement (Government of Western Australia 2023).

The Regional Corporations are in a development phase, with newly elected Board Directors determining their processes and priorities moving forward.

It was unfortunate timing for both the project, and Noongar leaders, that the REAP projects occurred in the early phase of Regional Corporation establishment. During this time (end of 2022 to beginning 2023), decision-making about research engagement had shifted from the South West Aboriginal Land and Sea Council to the Regional Corporations, but there was little capacity for the Regional Corporations to engage given their lack of administrative support at that time, and likely lower interest in engaging given new competing priorities stemming from the new agreements. During this phase there was no externally-facing presence for any of the Regional Corporations (including the Boards and the Cultural Advice Committees) which severely hampered engagement.

Including the right people in decision-making about the REAP project was critical, and the team was informed by senior Noongar people that the Regional Corporations were the correct entry point for engagement. As articulated in the Ballardong Aboriginal Corporations Cultural Advice Policy (2021, p. 1):

*We acknowledge that the people who possess direct knowledge of a place or area of Country are of key importance in making cultural decisions. We acknowledge that we need to incorporate all our cultural knowledge in our Cultural Advice and decisions. By including all knowledge holders we ensure that we meet our responsibilities to Country in the best way possible.*

Relevant to the development of Ecosystem Accounts is the development of a Noongar Land Estate (NLE) to be held by the Noongar Boodja Trust. This is a key component of the Settlement, and will require the WA Government to transfer:

- up to 300,000 hectares of land allocated as reserve or leasehold
- up to 20,000 hectares of land allocated as freehold for cultural or economic development use.

The Noongar Land Base Strategy sets out the process for how land will be identified and eventually allocated to the NLE.

The land to be allocated includes:

- unallocated Crown land
- unmanaged reserves
- Aboriginal Lands Trust (ALT) properties.

State Government agencies may also identify freehold land and reserves, for which they hold management orders but no longer require, for possible allocation to the NLE (Government of Western Australia 2023).

Management and utilisation of these lands may look very different once the transfers have been finalised, and the goals and aspirations of Noongar Traditional Owners have been realised. Opportunities stemming from emerging biodiversity markets will be one option for exploration.

# Glossary

TERM	DEFINITION
<b>Accounting component</b>	A single part that helps the overall system of accounts gather relevant data, translate it into useful information, and communicate it. In ecosystem accounting, core accounting components include ecosystem extent, ecosystem condition, and ecosystem services.
<b>Account-ready data</b>	data that has been prepared such that it can be used nearly directly (with minimal additional processing) for compiling ecosystem accounts
<b>Archetype models</b>	Archetype models describe the endogenous disturbance dynamics and ecosystem expressions that characterise systems with ecosystem integrity. These models are not operational and cannot be directly or solely used for measurement or mapping but provide a conceptual guide for description of reference and modified states in state and transition models.
<b>Basic spatial unit (BSU)</b>	the smallest unit of aggregation that is used consistently across accounts and against which stocks and flows are recorded
<b>Biodiversity</b>	the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems (CBD 1992)
<b>Biome</b>	a biotic community finding its expression at large geographic scales, shaped by climatic factors and characterised by physiognomy and functional aspects, rather than by species or life-form composition (Mucina 2019; United Nations et al. 2021)
<b>Community-level biodiversity</b>	consideration of biodiversity for an assemblage of species within a taxonomic group at a location
<b>Condition-hectares</b>	derived as the sum of condition index values from the account-ready data within each Ecosystem Accounting Area (EAA) subdivision, reported in units of hectares. For ecologically meaningful interpretation, condition-hectares enables correct and consistent comparisons between years and EEAs
<b>Ecological integrity</b>	an ecosystem's capacity to maintain composition, structure, functioning and self-organisation over time using processes and elements characteristic for its ecoregion and within a natural range of variability (United Nations et al. 2021) (compare 'ecosystem integrity')
<b>Economic unit</b>	establishments (e.g. an individual business) that are aggregated by industry (e.g. agriculture, mining, manufacturing, health, education) and sector (e.g. corporations, households, and government). Referred to in the System of National Accounts (SNA) as 'institutional units'
<b>Ecosystem</b>	a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (CBD 1992)
<b>Ecosystem accounting area (EAA)</b>	the geographical territory for which an ecosystem account is compiled (United Nations et al. 2021)
<b>Ecosystem asset</b>	a contiguous space of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions (United Nations et al. 2021)
<b>Ecosystem capacity</b>	the ability of an ecosystem to generate an ecosystem service under current ecosystem condition, management and uses, at the highest yield or use level that does not negatively affect the future supply of the same or other ecosystem services from that ecosystem (United Nations et al. 2021)
<b>Ecosystem condition</b>	the quality of an ecosystem measured in terms of its abiotic and biotic characteristics (United Nations et al. 2021)  In the AusEcoModels Framework (Richards et al. 2020), ecosystem condition is a measure of ecosystem integrity including the capacity of ecosystem states to maintain biodiversity and ecosystem flows and connections. In the context of state and transition models it is defined as the departure of each ecosystem state from the reference state.

TERM	DEFINITION
	The Habitat Condition Assessment System provides a condition score that represents the capacity of an area to provide the structures and functions necessary for the persistence of all species naturally expected to occur in that area if it were in an intact (or reference) state, and is calculated using departure from multiple locations in reference state (Williams et al. 2021).
<b>Ecosystem condition index</b>	composite indicators derived by aggregating from the combination of individual ecosystem condition indicators recorded in the ecosystem condition indicator account, using compatible reference levels from a common reference condition (United Nations et al. 2021, para. 5.81). Alternatively, this index may be derived using expert opinion.
<b>Ecosystem condition indicator</b>	rescaled version of ecosystem condition variables (United Nations et al. 2021)
<b>Ecosystem condition characteristic</b>	an ecosystem characteristic that is relevant for the assessment of ecosystem condition (United Nations et al. 2021)
<b>Ecosystem condition typology</b>	a hierarchical typology for organising data on ecosystem condition characteristics (United Nations et al. 2021)
<b>Ecosystem condition variable</b>	a quantitative metric describing individual characteristics of an ecosystem asset (United Nations et al. 2021)
<b>Ecosystem conversion</b>	situation in which, for a given location, there is a change in ecosystem type involving a distinct and persistent change in the ecological structure, composition and function which, in turn, is reflected in the supply of a different set of ecosystem services (United Nations et al. 2021)
<b>Ecosystem expression</b>	a distinct, recognisable, but transient phase within both the reference state and modified states of ecosystems. Each ecosystem state is dynamic and contains one to several ecosystem expressions, which have different ecosystem characteristics resulting from disturbance and biomass recovery processes.
<b>Ecosystem extent</b>	the area of an ecosystem asset in terms of spatial area (United Nations et al. 2021)
<b>Ecosystem functional groups (EFG)</b>	third level of the International Union for Conservation of Nature (IUCN) Global Ecosystem Typology (GET) classification. They are functionally distinctive groups of ecosystems within a biome and are defined in a manner consistent with the CBD definition of ecosystems (United Nations et al. 2021).
<b>Ecosystem integrity</b>	the level of intactness, completeness and integration in the structure, composition and function of an ecosystem with respect to the persistence of biodiversity. If a system is able to maintain its organisation (function and structure) over time in response to environmental disturbance cycles then it is said to have integrity (Kandziora et al. 2013; Kay 1991) (compare 'ecological integrity')
<b>Ecosystem services</b>	the contributions of ecosystems to the benefits that are used in economic and other human activity (United Nations et al. 2021)
<b>Ecosystem site condition</b>	The ecosystem site condition sub-index of ecosystem condition arises from an application of the Habitat Condition Assessment System (HCAS) which provides an estimate of habitat condition for an individual site, and further incorporates the negative landscape context effects of local pressures. Scores range from 0.0 (ecosystem integrity extinguished) to a maximum of 1.0 (ecosystem integrity in reference condition).
<b>Ecosystem state</b>	the observed ecosystem (including its structure, function and composition) at a particular point in space and time
<b>Ecosystem state condition</b>	The ecosystem state condition sub-index of ecosystem condition arises from an application of the Australian Ecosystem Models Framework that derives from eliciting expert knowledge of ecosystem reference and modified states for a specified set of ecosystem types, and their associated condition scores in the range from 0.0 (ecosystem integrity extinguished) to a maximum of 1.0 (ecosystem integrity in reference condition). Ecosystem state condition for each ecosystem type can be mapped using expert rules linking reference and modified ecosystem state characteristics to remotely-sensed variables.
<b>Ecosystem type</b>	In the SEEA EA standard: an ecosystem type reflects a distinct set of abiotic and biotic components and their interactions (United Nations et al. 2021). In AusEcoModels Framework: a unit of an ecosystem classification defined by the ecosystem characteristics (for example, facets of structure, function, composition) that characterise the reference state for a given scale of organisation, for example defined by its discrete



TERM	DEFINITION
	disturbance and recovery dynamic (Kay 1991; Richards et al. 2020). An ecosystem type, once defined, may be spatially identified and mapped.
<b>Effective habitat area</b>	The estimated total area of habitat within a region available for biodiversity, considering the ecosystem condition of each location (grid cell) within that region. Calculated as the area of the region multiplied by the average ecosystem condition of all grid cells within that region.
<b>Gross Value Added (GVA)</b>	a standard approach to measuring the value of production in national accounts. GVA is the value of the output at basic prices (the price received by the producer, adjusted for tax payable and subsidies receivable) less the value of intermediate consumption at purchasers' prices (the price paid by the producer for inputs, excluding any deductible tax) (ABS 2022).
<b>Habitat condition</b>	The habitat condition subindex of ecosystem site condition arises from an application of the Habitat Condition Assessment System (HCAS) which provides an estimate of habitat condition for an individual site. Scores range from 0.0 (ecosystem integrity extinguished) to a maximum of 1.0 (ecosystem integrity in reference condition). Habitat condition is the capacity of an area to provide the structures and functions necessary for the persistence of all species naturally expected to occur there, as if it were in a reference state (Williams et al. 2021).
<b>Habitat Condition Assessment System</b>	a method to remotely assess and map the generalised condition of natural habitat for terrestrial native biodiversity at a location against a reference condition derived from the dynamics of the most intact examples of native vegetation / ecosystems across contemporary Australia (Williams et al. 2021). Output is equivalent to an overall index of ecosystem condition in the SEEA EA framework
<b>Inferred local pressures</b>	The inferred local pressures sub-index of ecosystem site condition derives from an application of the Habitat Condition Assessment System (HCAS) as the distance-weighted average of the habitat condition sub-index, declining exponentially within a 2 km window to identify the negative landscape context effects of local pressures. Scores range from 0.0 (ecosystem integrity extinguished) to a maximum of 1.0 (ecosystem integrity in reference condition).
<b>Integrity</b>	see 'ecosystem integrity'
<b>Managed additions or reductions</b>	change in ecosystem assets predominantly attributable to actions by people in managing the land they occupy
<b>Modified state</b>	an ecosystem state that is not in reference condition, due to exogenous disturbances. Modified states are dynamic, and change between ecosystem expressions resulting from interactions between endogenous and exogenous disturbances (for example, natural flood events may shift expressions within a modified state in conjunction with managed environmental watering events).
<b>Species persistence</b>	the ongoing maintenance of a species as viable populations over the long term
<b>Potential extent of occurrence</b>	the area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the current known localities, as well as inferred occurrence and projected original occurrence of a species (Brooks et al. 2019)
<b>Reference condition</b>	the condition against which past, present and future ecosystem condition is compared to in order to measure relative change over time (United Nations et al. 2021)
<b>Reference level</b>	the value of a variable at the reference condition, against which it is meaningful to compare past, present or future measured values of the variable (United Nations et al. 2021)
<b>Reference site</b>	a location in the landscape which is the least modified example of its ecosystem type and retains high ecosystem integrity
<b>Reference state</b>	the dynamic state of an ecosystem that has ecosystem integrity and is in reference condition. Archetype models are used as templates for the description of a reference state for a particular ecosystem type. Usually reference states refer to a local example of an ecosystem and contain more detailed quantitative information on ecosystem characteristics and endogenous disturbance regimes, compared to the archetype model.
<b>Reporting area</b>	subdivision of the Ecosystem Accounting Area
<b>Species-level biodiversity</b>	consideration of biodiversity for each individual species separately
<b>Species.hectares</b>	unit for threatened species effective habitat and defined as the number of threatened species multiplied by the effective habitat area

TERM	DEFINITION
<b>Species richness</b>	the number of species occurring in a location, typically considered within a specific taxonomic group
<b>State and transition model</b>	conceptual tool that describes the state of a particular ecosystem (which may vary, for example, from reference to degraded, in terms of ecosystem integrity), and the drivers or agents that cause transitions between states (Bestelmeyer et al. 2017; Stringham et al. 2003; Westoby et al. 1989). Transitions between states occur as a result of the introduction of new exogenous disturbance regimes, the transformation of transient disturbances into persistent disturbances, and/or changes to reference disturbance regimes (resulting in a shift to an exogenous disturbance), altering environmental conditions and resources available to constituent species. These changes may be directly caused by recent anthropogenic modification of local habitats (e.g. vegetation thinning or clearing, stock grazing, introduction of native or alien invasive species), or may result from recent and rapid climate change (i.e. an indirect anthropogenic driver). Transitions in state and transition models are difficult to reverse without application of intensive management, an extreme event or long timeframe (Bestelmeyer et al. 2017, 2009), and are distinguished from pathways between different ecosystem expressions within a state, which often result from slow-acting but incremental successional processes (Rumpff et al. 2011).
<b>Stock account</b>	a way of recording information about the quality or quantity and changes (additions and reductions) of ecosystem assets between temporal units (e.g. years)
<b>Supply and use table (SUT)</b>	the ecosystem services reported in supply and use tables will be equal to the actual flow between the ecosystem assets and economic units. The flow of ecosystem services can be measured in either biophysical terms (in biophysical supply and use tables) or in monetary terms (in monetary supply and use tables)
<b>System of National Accounts (SNA)</b>	an internationally agreed standard method of collecting, organising, and reporting information on national economic activity
<b>SNA benefits and Non-SNA benefits</b>	Some ecosystem services contribute to benefits that are delivered as goods and services within the economy (e.g. food, timber, water). These benefits are already included within the System of National Accounts (SNA) and are termed 'SNA benefits' and already form part of measures such as gross domestic product (GDP). Other ecosystem services contribute to benefits that are not within the production boundary of the SNA (e.g. clean air, flood protection or water filtration provided by ecosystems). These benefits are termed 'non-SNA benefits' (United Nations et al. 2021 section 6.2.2, p.123).
<b>Thematic account</b>	Standalone accounts, or sets of accounts, that organise data around specific policy-relevant themes, such as accounting for biodiversity, carbon and oceans, or protected areas, wetlands, forests and urban areas.
<b>Transition</b>	change between ecosystem states
<b>Trend</b>	qualitative or quantitative assessment of the general direction of change (e.g. increasing, decreasing, steady) that is developing based on a time-series of measurements
<b>Unmanaged additions or reductions</b>	change in ecosystem assets predominantly attributable to natural system processes and dynamics such as climatic variability, fire regimes and biotic interactions
<b>Umbrella class</b>	group of archetype models in the AusEcoModels Framework (Richards et al. 2020) that is compatible with Major Vegetation Groups in the National Vegetation Information System (NVIS) (NVIS Technical Working Group 2017)
<b>Variant</b>	Different form of a state, similar to an expression within a state except that variants are alternatives rather than part of a dynamic. Variants share the same drivers and general characteristics of the state but vary in their exact structural form or species composition. For example, they may reflect categories along a gradient (e.g. degree of tree cover or understorey degradation, driven by degree of tree clearing or livestock grazing). Variants are used to acknowledge variation within states whilst avoiding the significant complexity that would be introduced by treating them as separate states.

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