Northern Australia Environmental Resources Hub

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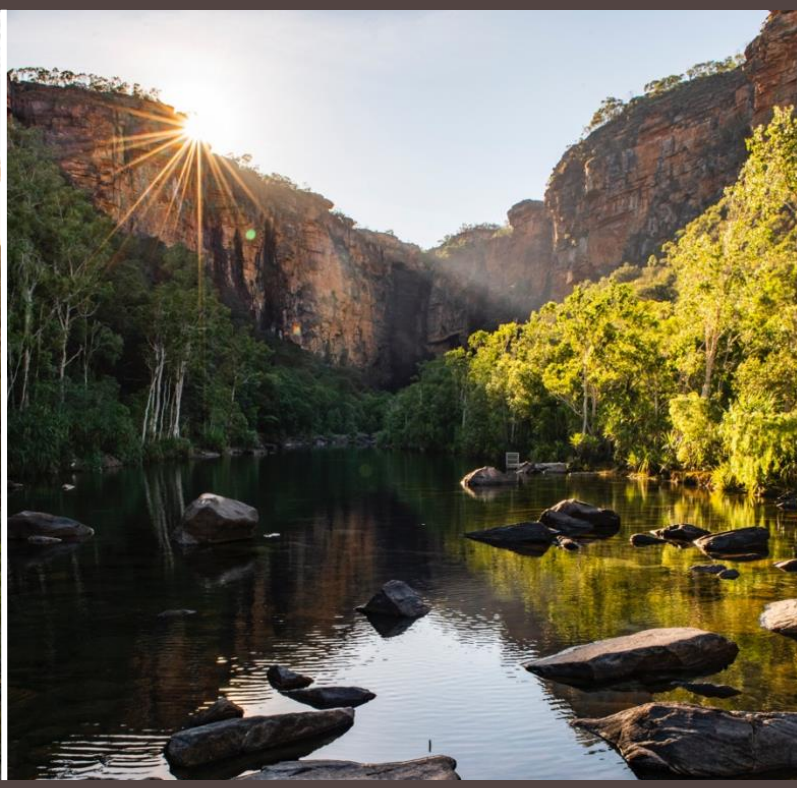

Valuing Indigenous cultural connections

Final report

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Cover photographs:

Left: Talaroo Hot Springs on Ewamian traditional Country (photo: Ewamian Aboriginal Corporation).
Right: Jim Jim Falls in Kakadu National Park on the traditional Country of Mungguy people (photo: Northern Australia Environmental Resources Hub).

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Acronyms

DAWE..... Department of Agriculture, Water and the Environment

DPSIR..... Drivers, Pressures, State, Impacts, Response

EAC ..... Ewamian Aboriginal Corporation

EEA ..... Environmental-Economic Accounting (Australia

EEA EA ..... Environmental-Economic Accounting – Ecosystem Accounts (Australia)

GKP..... Gunbower-Koondrook-Perricoota Forest Icon Site

ILUA ..... Indigenous Land Use Agreement

IPA..... Indigenous Protected Area

KNP ..... Kakadu National Park

LEAP ..... Land and Ecosystem Accounting Project

NESP..... National Environmental Science Program

NRM..... natural resource management

PBC ..... Prescribed Body Corporate

SEEA..... System of Environmental-Economic Accounting (United Nations)

SEEA EA.... System of Environmental-Economic Accounting – Ecosystem Accounting (United Nations)

SEEA CF.... System of Environmental-Economic Accounting – Central Framework (United Nations)

SNA ..... System of National Accounts

TO..... Traditional Owner

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1. Executive summary

This project delivers a new approach that will enable Indigenous cultural connections to, and the sustainable management of, Country to be 'valued' alongside emerging environmental-economic accounts that attribute a monetary value to ecosystems services.

Conventional environmental-economic accounting relies on a linear model, in which the size (extent) and condition of a particular natural area and its ecosystems determines the flow of 'services' to people and, hence, the dollar value of their various benefits. Ecosystem services are diverse, ranging from food, fresh water, fibre and resources to carbon capture, erosion control, recreation and spiritual benefits. However, Indigenous communities see people as an integral part of complex, interconnected ecosystems and consider stewardship of the environment, or care for Country, as a reciprocating relationship. Within this holistic, virtuous cycle Country cares for people, and hence delivers ecosystem services, because people care for Country.

While the importance of this Indigenous model for maintaining precious ecological resources is now widely recognised, a key challenge lies in measuring or defining its 'value'. This is increasingly important as recent international and national environmental accounting initiatives provide new opportunities for the considerable, but long overlooked, value of ecosystem services to be factored into policy- and decision-making and environmental and land management.

The development by the Australian Government's Department of Agriculture, Water and the Environment (DAWE) of an experimental system that will account for ecosystem services from 2022, means the questions of *if*, or (if the answer to *if* is 'yes') *how*, valuable Indigenous connections to Country can be integrated into such accounts is pressing. To provide an answer for DAWE, we partnered with two distinct groups of Indigenous Traditional Owners (TOs) from regions in Queensland and the Northern Territory.

We found that accounting approaches which consider only the one-way flow of ecosystems benefits to people and the various ecosystems service categories and monetary values that underpin emerging ecosystem accounting frameworks **were fundamentally incompatible with Indigenous values**, concepts and relationships with Country.

This means, the **'value' of Indigenous land management cannot simply be captured by integrating Indigenous practices into Australia's overarching Environmental-Economic Accounting – Ecosystem Accounts (EEA EA).** We deliberately place quotation marks around the word 'value' – flagging that in this report, we interpret the word 'value' through an (almost) psychological lens (i.e. as something that is 'important') rather than through a financial lens (i.e. as something that is worth considerable amounts of money in a market). We worked with **our Indigenous partners to develop an alternative, parallel 'valuation' model and a generic method/process and set of indicators** to enable connections to Country to be accounted for. This will enable future Indigenous-led partnerships to develop specific, context specific indicators for the diverse Indigenous communities across Australia.

1.1 A partnership approach to understanding the value of connections to County

Australia's Indigenous peoples have been managing their Country for tens of thousands of years. Their deep understanding of Country and their knowledge of its sustainable management is critically important to science, to natural resource management and Australia's future. The importance of investing in Indigenous land management was first recognised by the Australian Government in the 1980s, through Indigenous Land and Sea Management projects and subsequently by state governments and philanthropic organisations. Apart from the intended environmental benefits, numerous economic, social, health and wellbeing benefits have since been documented, flowing both from ecosystems services and activities involved in caring for Country. This means a dynamic two-way flow of benefits must be factored in when 'valuing' ecosystem service flows and ecosystem assets within an Indigenous caring for Country model. Our literature review suggested this required new methods, including:

a) considering entire landscapes rather than component parts. Western approaches tend to disaggregate and then add to estimate total values – e.g. identifying different services provided by different parts of Country (includes land, coastal and sea Country), monetising each separately and then adding. The literature suggests that it may, instead, be better to consider the entire landscape as a 'bundle'; crudely analogous to considering the value of a meal, rather than the value of each of its component parts such as food, drink, good company.
b) valuing/prioritising activities that do the most to enhance whole-of-landscape health, rather than seeking to value/prioritise different parts of the landscape (such as prioritising land management practices which are intended to preserve and maintain entire landscape values (as per the point above) – rather than prioritising (parts of) the landscape.)
c) providing opportunities for Indigenous communities to collectively determine values/preferences, rather than assuming that community values/preferences can be estimated by eliciting and then aggregating the values/preferences of individuals.

Seeking to capture and reduce to a numerical value the rich and complex relationships between any people and their culture is fraught with risk, given the limitations of non-market valuation methods of accounting and even general recording methods (e.g. writing, enumeration). Consequently, we first sought to better understand how our Indigenous partners, the Mungguy people of Kakadu National Park (KNP) in the Northern Territory and the Board of the Ewamian Aboriginal Corporation (EAC) in Queensland viewed their own cultural connections to Country. We aimed to collaborate in a culturally appropriate manner, while simultaneously generating useful outcomes for both DAWE and our Indigenous partners. Across Australia, there are more than 500 distinct Indigenous cultural and language groups, with diverse cultures, histories, circumstances and connections to Country. Some of this diversity is reflected in our two distinct case studies.

In workshops with Ewamian people and Mungguy people, a project prioritisation process[1] was tested using a deliberative process of social decision-making. Each group collectively envisaged desirable projects to strengthen their connections to Country. These were wide ranging. They included improving people's capacity to access and care for Country by addressing socioeconomic disadvantage and promoting cross-cultural education, as well as projects to facilitate more time on Country, the consumption of bush tucker, Indigenous rangers on Country and opportunities to rehabilitate the land. A comparison of the scores nominated for each project provided an indication of their relative importance to the two groups. By then including a variable with a monetary value (in addition to the projects developed by participants) projects could then be identified that had a greater dollar value to the community than the financial benefit on offer (for example, a reduction in power bills).

This process did not enable the value of each individual benefit provided by each project to be estimated. However, **this method laid the foundation for estimating the 'value' of 'bundles' of related and interconnected benefits** and will enhance understanding of the two-way flow of benefits within reciprocating Indigenous systems, providing useful information to decision-makers.

Co-developing a new model for Indigenous cultural connections to Country

From these insights, two conceptual models were developed – one with our Ewamian partners (EAC) and one with our Mungguy partners – that described connections to Country characterised by reciprocating relationships and feedback loops. People who care for Country benefit both directly (for example, undertaking a 'walking cold burn' of Country provides an opportunity to walk around to learn about rock art, plants and animals, men's and women's places and potential threats) and indirectly (cold burning regenerates Country without damaging it). These reciprocating relationships can be represented in **a dynamic model that is, in theory, indefinitely sustainable** (Figure 1-1) if the stewardship activities that are undertaken by humans (to support nature) are sufficient to replenish any drawdown in (natural) capital that occurs when humans benefit from nature (through ecosystem services). However, real world structural barriers, such as the historical or contemporary dispossession of land and/or disconnection from knowledge of Country **can prevent people from:**

a) Reaping the benefits of ecosystem services provided by nature (blue barrier).
b) Undertaking stewardship activities (green barrier) that benefit nature
c) Undertaking stewardship activities in the 'right way' to create co-benefits that directly benefit people (orange barrier – disembodied stewardship*)*

These barriers act as breaks or leakages and weaken or disrupt the sustainable nature-people system, undermining the overarching Indigenous *'healthy people, healthy Country'* model over time.

[1] The prioritisation process involved participants developed a list of potential projects, which were then scored across two rounds with discussion between each round of scoring.

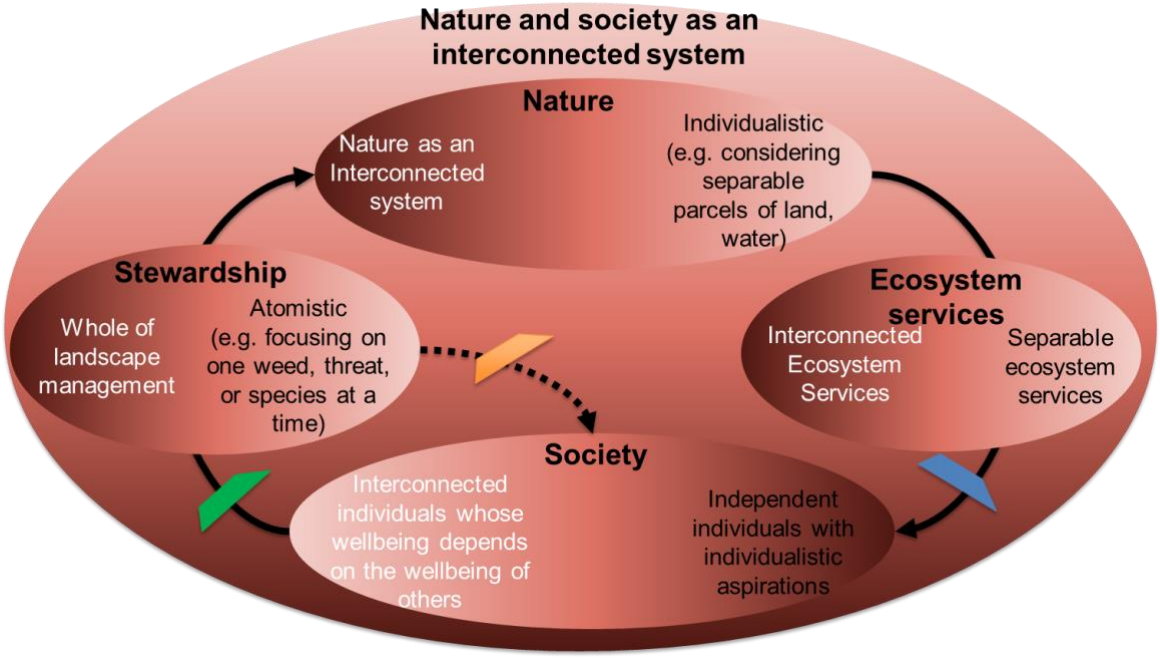

Figure 1-1. Dynamic model showing connections between people and Country.

While barriers to accessing nature (a) or opportunities to care for Country (b) were identified in both workshops, the Mungguy project also highlighted the additional structural barrier of **disembodied stewardship** (c). That is, **when Country is not cared for the 'right way', many of the benefits of caring are not reaped**. For example, when Country is burned from helicopters by non-Indigenous pilots, the benefits are reduced to carbon credits associated with reductions in fire intensity, compared to the multiple benefits to undertaking a walking cold burn on Country.

Key findings/recommendations:

1. **Additional 'people-focused' indicators are needed for ecosystem accounting to capture Indigenous connections to Country**

As the Australian Government embraces EEA EA, it is clearly important to monitor the extent and condition of ecosystems, the capacity of ecosystems to deliver services and the flow of benefits from those ecosystems to people (a core task for EEA EA). However, our research and the resulting new model, Figure 1-1, highlights the importance of monitoring/measuring equivalent stocks and flows associated with the *people* who are an integral part of this connected system (Figure 1-2).

This modified view of the core contributors to EEA suggests **generic groups of additional indicators** (Table 1-1) **could be used alongside (but not integrated into) existing accounts to better capture key relationships/variables/issues that support Indigenous connections to Country**. These may include indicators of: TOs' access to Country; the socioeconomic condition, health and wellbeing of TOs; and whether Country is being looked after the 'right' way by the 'right' people (this should also consider governance and management). Critically, just as the 'right' people need to look after Country the 'right' way, it is also important that the 'right' people determine what should be monitored and measured. Our suggestions are thus deliberately broad, noting that the TOs are the appropriate group(s) to determine specifics – discussed below.

2. The development of specific indicators for 'valuing' connections to Country must be Indigenous-led

Accounting for cultural connections is an iterative process and future projects could develop specific measures, based on our generic approach, and evaluate their relevance for TOs and government. This would further refine a systematic process for engaging with Indigenous Australians to account for their cultural connections to land.

Given the incompatibility of the one-way western concept of the provision of ecosystem services to society and the circular Indigenous model of connections to Country – *and* the diversity of Indigenous communities – the development of specific indicators must be Indigenous led and context specific. The collection of specific indicators that reflect the distinct culture, history, practices and circumstances of each Indigenous group should be led and/or directed by TOs, following appropriate knowledge-sharing protocols. The additional data could be used by TOs to support decision-making as well as more broadly. For example, it may inform or enrich the Australian government's emerging ecosystem accounting system or the development of guidelines around ecosystem accounting worldwide.

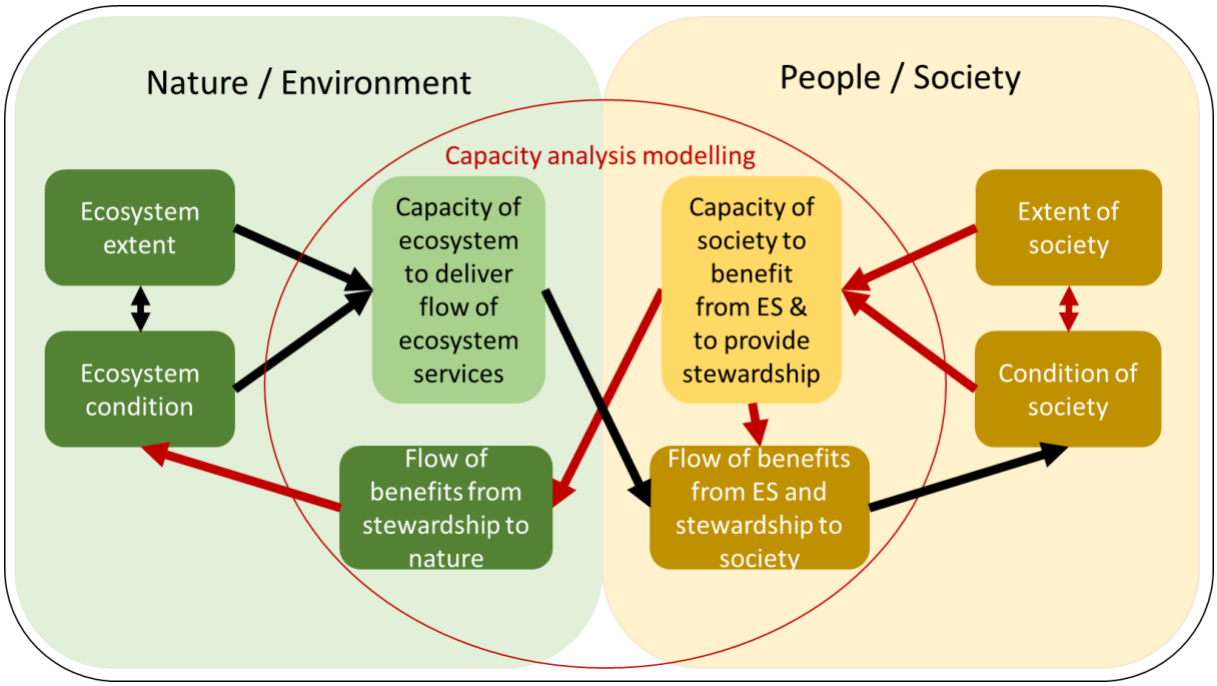

Figure 1-2. Relationships between capacity, ecosystem accounting and society. Flows depicted by black arrows represent the flow of benefits recognised within the United Nations System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA), adapted from the SEEA Committee of Experts on Environmental-Economic Accounting (2021) System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft, Figure 6.1, page 145 (UNCEEA, 2021) (which was itself based upon Maes et al. (2018)). We add society to the relationship, with red arrows depicting flows of benefits from society. Further, we add the need for capacity analysis modelling to include not only the capacity of ecosystems to deliver ecosystem services (as recommended by SEEA EA) but also the capacity of society to benefit from ecosystem services and to provide stewardship services.

Table 1-1. Enabling factors (to generate ecosystem-service values) and additional (broad classes of) indicators that could be included in Environmental-Economic Accounting – Ecosystem Accounts to better capture core factors relevant to Indigenous connections to Country.

	Ecosystem asset (stock)	**Ecosystem service (flow) SEEA EA**	**Society (stock)**	**Natures benefits from people (flow)**	**People benefit from looking after Country (flow)**
Enabling factors (must be present for people to be able to (a) benefit from ecosystem services [no benefit, no 'value' – of either flow or asset] and (b) maintain condition of Country [thus ensuring long term sustainability]).	*Ecosystem must be present and in good condition (extent and condition).*	*TOs must have access to Country.*	*TOs must be healthy enough to get out on Country and appreciate services.*	*The Country must be looked after the right way.*	*The 'right' people (TOs) need to look after Country.*
Potential indicators to measure/monitor Some can be general, some context-specific.	Numerous examples through the literature (including condition of sacred sites) – not repeated here.	Number of people who are able to go out on Country, the places they are able to access and the length to time they are able to stay. Could also keep track of age, gender (etc) of visitors and of activities undertaken while there. Could also aim to monitor perceived benefits (flow) from native title, Indigenous Protected Areas (IPAs), Indigenous Land Use Agreements (ILUAs), etc.	Could monitor overall (subjective) wellbeing of people; in addition to monitoring objective indicators of wellbeing (that may include things such as income, housing, education, physical health, etc – these should be selected by community). Land tenure relating to native title (IPAs, ILUAs, etc)	Extent to which TOs are satisfied that their Country is being looked after the 'right' way. Extent to which Traditional knowledge and practices are used when caring for Country &/or satisfaction of TOs that the correct practices are being used. Extent to which TOs manage and make decisions.	Number of TOs who can go out and care for Country (relative to number of non-TOs caring for Country).

2. Introduction

Australia's federal, state and territory governments have committed to a common national approach to environmental-economic accounting to inform decision-making in government, community and business[2]. Simplistically put, such ecosystem accounts enable the monitoring of the health of the environment by measuring ('valuing') the ways in which humans benefit from nature, and, in doing so, how various human activities impact on, or deplete, nature.

An agreed National Strategy and Action Plan to implement EEA across Australia has twin objectives. By fostering the consistent application of the United Nations System of Environmental-Economic Accounting (UN SEEA or SEEA) nationwide, the plan will lay the foundations for the development of the first core set of standardised national environmental-economic accounts. These accounts are based on the ecosystem services framework which groups benefits into three broad categories:

- **provisioning services**, including food, fresh water, wood, fibre and fuel
- **regulating services**, including natural processes that control flood and disease, purify water, reduce erosion and store carbon
- **cultural services**, in which nature inspires and supports spirituality, provides aesthetic benefits, and is used for recreation, tourism and education.

The national implementation of this EEA strategy is coordinated by DAWE, in close collaboration with other federal, state and territory agencies, including the Australian Bureau of Statistics, CSIRO, business, academia, and natural resource management (NRM) and not-for-profit environment organisations (IJSC, 2018). To further progress this national strategy, DAWE are leading the Land and Ecosystem Accounts Project (LEAP).

The development of a series of ecosystem accounts in two national parks is among LEAP's multi-faceted aims. The parks are the Gunbower–Koondrook–Perricoota Forest Icon Site (GKP; working in partnership with the Murray–Darling Basin Authority) and Kakadu National Park (KNP) in the Northern Territory. The overarching objectives of these two case studies are to:

- describe the values of the case study sites in accordance with the SEEA Ecosystem Accounting (SEEA EA) framework (UNCEEA, 2021)
- illustrate the applicability of ecosystem accounting to support a wide range of decision-making
- engage and involve local stakeholders, particularly Indigenous landholders
- generate lessons that can inform future ecosystem service/flow accounts, including by building and illustrating an operational accounting framework for ecosystems.

The research reported on here, contributes to these objectives. It focuses on KNP and our preliminary study that informed the design, process and research method for the research was conducted within the park. This pilot study was undertaken and co-developed in partnership with the EAC Board[3], whose Country is located in the Gulf of Carpentaria savanna lands in north Queensland. The GKP case-study is reported on separately[4].

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[2] For further detail see https://eea.environment.gov.au/about/national-strategy-and-action-plan
[3] For further information regarding the EAC, see https://www.ewamian.com.au
[4] For further information, see https://eea.environment.gov.au/media/163

Our work was funded by the Northern Australia Environmental Resources Hub of the National Environmental Science Program (NESP), a long-term Australian Government initiative that is investing some $300 million in environment and climate research[5]. Our cross-disciplinary, cross-institutional team has a proven track record of collaborating successfully to further understanding of both accounting and environmental economics and the unique relationships between Indigenous peoples and traditional lands. The team includes non-Indigenous and Indigenous researchers from James Cook University, the University of Tasmania and the University of Western Australia, with long term connections to Indigenous communities in the study area, and considerable experience in designing and conducting culturally appropriate research.

2.1 Can Indigenous cultural connections be captured within the EEA EA framework?

Both the Kakadu-focused and the related Ewamian research explored options for acknowledging and possibly including Indigenous cultural connections within Australia's EEA EA framework, in a culturally appropriate manner. We simultaneously sought to generate useful outcomes for the researchers' Indigenous partners. To contribute to the development of Australia's EEA EA framework, this research aimed to:

- advise DAWE of how best to acknowledge Indigenous cultural values within, or alongside, their experimental ecosystem accounting system, including estimates of value if possible
- develop and test methods for estimating (prioritising) values and reciprocal relationships between people and Country
- assist our Indigenous partners to prioritise different caring-for-Country activities
- facilitate networking opportunities between our Indigenous partners
- provide Indigenous groups with a stronger voice in discussions about ecosystem accounting.

Researchers partnered with TOs to co-develop a process that could determine **whether it would be appropriate or possible to consider Indigenous cultural connections to Country within the EEA EA accounts and – if so – how.** This involved engaging with TOs to first garner their perspectives and views and collaborating on all aspects of the research design, process, analyses, conclusions and recommendations.

2.2 Managing culturally appropriate research during the COVID-19 pandemic

The research team first developed and trialled their approach with the board members of the EAC, as there were long-established research links and, critically, the EAC had expressed interest in being involved. This engagement built on a previous NESP-funded project[6], during which concepts of ecosystem services and the tenuous links to Indigenous cultural services were touched on.

[5] http://www.environment.gov.au/science/nesp
[6] https://www.nespnorthern.edu.au/projects/nesp/multiple-benefits-knowledge-systems-ilmps

Once initial ideas were developed with the EAC, the research was to expand across KNP. Working in partnership with the Kakadu Indigenous Research Committee (and including the Bininj-Mungguy TOs from across KNP), research methods developed with the EAC were to be revised and adapted, as appropriate, for local circumstances and contexts across the park region.

However, due to multiple factors including travel restrictions imposed by the COVID-19 pandemic, the geographic scope of the work was curtailed. Rather than being able to work with TOs from the entire KNP region, the research team was restricted to working within the southern region of the park, with the Mungguy people.

Nevertheless, we were able to develop some deep insights and to leverage those insights to suggest ways in which some of the issues relevant to our partners and their connections to Country might be explicitly recognised in the EEA EA accounts. Importantly, our research highlights that these connections could be recognised in a way that is fundamentally different to the way in which (western) ecosystem services are usually captured or valued. Where appropriate, we sought to frame Indigenous concepts and insights from our workshops in a manner that may help those unfamiliar with ecosystem service accounting to understand the similarities and differences between western and Indigenous views.

2.3 Report structure

Section 3 situates the research by introducing key elements of SEEA and by briefly outlining some of the complexities of applying such accounts (which rely heavily, although not exclusively, on 'valuation') in Indigenous contexts. We also describe some of the key philosophical issues that should be considered if attempting to 'account' for culture in EEAs. This highlights the importance of recognising and respecting different worldviews and of prioritising the needs of those for whom one is 'accounting' – in this case, Australia's TOs (Section 3.2). This also helps justify our generic methodological approach. That is, to first seek to better understand Indigenous views about their connections to Country and, second, to consider how those views do (and do not) fit within the concepts that underpin EEAs.

Section 4 introduces our Indigenous partners, providing background information on their people, culture and Country. It then expands on our methods, co-designed with our Indigenous partners.

Section 5 focuses on the results and findings from our workshop with the Ewamian people in Queensland.

Section 6 focuses on the results and findings from our workshop with the Mungguy people of KNP.

Section 7 discusses the findings, outlines conclusions, and make recommendations for how future work could approach accounting for Indigenous cultural connections to Country within an ecosystem-accounting framework.

3. Background

3.1 The Australian Environmental-Economic Accounting system and United Nations System of Environmental-Economic Accounting

The development of the Australian EEA EA system is being guided by the SEEA. The SEEA framework integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and the changes in stocks of environmental assets as they benefit humanity. The SEEA is described in two volumes, each with different but complementary perspectives on the links between the environment and humans/human activities. The more established SEEA Central Framework (SEEA CF) starts with the economy and links it to physical information on natural assets, flows and residuals. The more recently developed SEEA EA starts with ecosystems and links their services to economic and other human activity.

The SEEA CF and the SEEA EA each seek to provide environmental economic information. However, their different and complementary perspectives mean that taken together they provide the foundation for measuring the relationship between human activity (within and outside of the economy) and the environment. These complementary perspectives also can be considered within the DPSIR (Drivers, Pressures, State, Impact, Response) framework which is widely used for measuring and analysing the connection between the environment and the economy.

The SEEA CF provides information about pressures and responses, including impacts on the condition of the environment (positive and negative) due to economic activities and the costs of conservation activities, while the SEEA EA provides information about the state and impact components of the DPSIR framework. In addition to its ecosystem perspective (rather than starting from the perspective of the economy), the SEEA EA also adds spatial detail. This provides information on the variations in the extent and condition of ecosystem services provided in various geographic areas, rather than aggregating the economic benefits to provide an overall total for a larger region (such as the nation as a whole).

The SEEA framework applies the accounting principles used within the System of National Accounts (SNA), the internationally adopted and widely used standard set of recommendations for the measurement of economic activity (United Nations, 2009). By applying national accounting principles, the SEEA framework allows for a unique integration of environmental and economic data to support decision-making. The harmonisation of these data can facilitate the widespread use of both environmental data on ecosystems in economic decision-making and economic data in environmental decision-making.

3.1.1 System of Environmental-Economic Accounting – Central Framework

The SEEA CF considers ‘individual environmental assets’, such as water resources, energy resources, etc. and how those assets move between the environment and the economy, covering environmental flows, stocks of environmental assets and economic activity related

to the environment[7]. The framework brings together the separate accounts that relate to multiple aspects of the natural environment into an integrated system. This enables environmental values to be considered more precisely and comprehensively in economic decision-making. SEEA CF begins with the economy, focusing on the use made by the economy of individual environmental assets and resources (such as timber, water, soil and fish), and provides information on how these natural assets interact with the economy. The environmental goods-and-services sector account includes flows of resources into the economy and flows of emissions and wastes out from the economy, while the environmental-protection expenditure account and the resource--management expenditure account seek to account for expenditures incurred in protecting or managing natural assets.

3.1.2 System of Environmental-Economic Accounting – Ecosystem Accounting

SEEA EA provides an integrated and comprehensive statistical framework for organising data about habitats and landscapes, presenting biophysical data on the extent and condition of ecosystems, measuring changes in these ecosystems and the ecosystem services provided, and linking this information to economic and other human activities and wellbeing. Rather than focusing on individual environmental assets, the SEEA EA instead begins by focusing on ecosystems (where biotic and abiotic elements function together, such as in forests, lakes, coral reefs, wetlands), and provides information on the benefits the ecosystems provide, including economic activities (which will also be reflected within the national economic accounts, accounted for using SNA) and other human activities outside of the economy (which are outside the scope of national accounts presented using SNA) – see Figure 3-1.

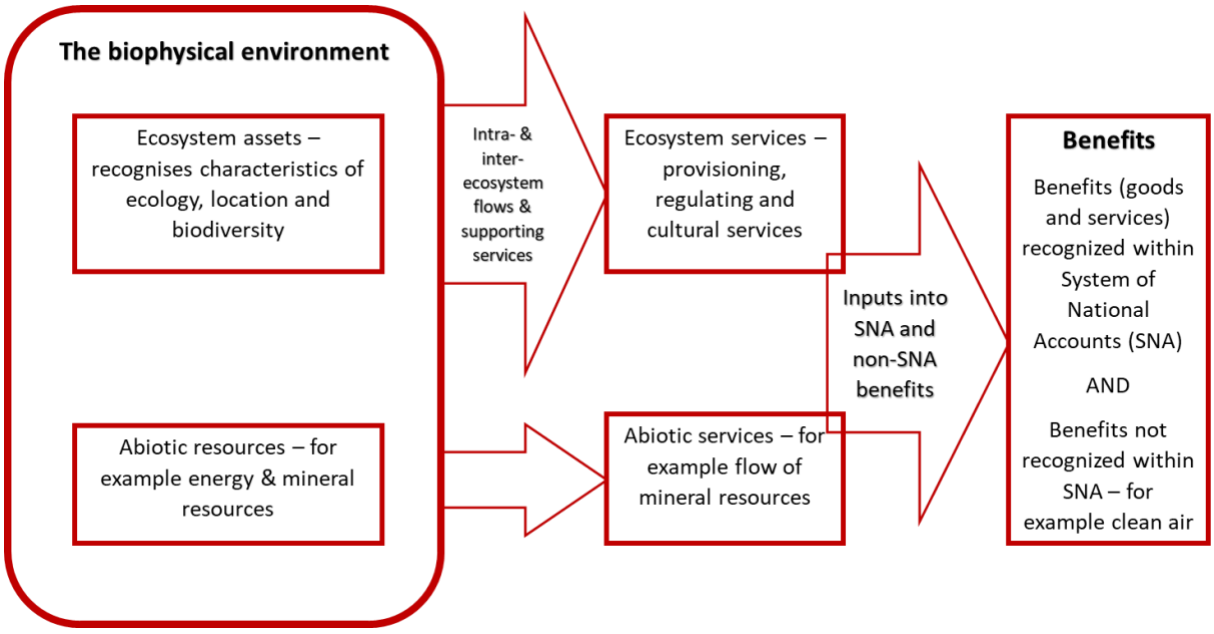


Figure 3-1. Broad model of flows in ecosystem accounting, adapted from System of Environmental-Economic Accounting (2012) Experimental Ecosystem Accounting p21 Figure 2.3 (United Nations, 2014b).

[7] For more information, visit https://seea.un.org

Initially drafted in 2012, the experimental SEEA EA was formally jointly published in 2014 by the United Nations, European Commission, Food and Agriculture Organization of the United Nations, Organisation for Economic Co-operation and Development and the World Bank (United Nations, 2014b). A revision of the experimental SEEA EA was formally launched in 2018[8], and following a global consultation process, the final draft of the SEEA EA was submitted to the UN Statistical Commission for discussion and approval at the March 2021 session (UNCEEA, 2021).

3.1.3 Ecosystems, ecosystem services and environmental-economic accounts

Figure 3-1 highlights the wide range of different ecosystem services provided by biotic and abiotic resources. Although various classification systems have been developed, particularly the Common International Classification of Ecosystem Services (Haines-Young & Potschin, 2018) and the National Ecosystem Service Classification System (NESCS Plus)[9], there is, as yet, no internationally agreed classification system for ecosystem services. In the meantime, the SEEA EA has developed and included a reference list of selected ecosystem services, and notes an internationally agreed classification system for ecosystem services will be developed in the future. The current reference list, which SEEA EA notes is not exhaustive (and can be found at UNCEEA, 2021, pp. 125-129) is structured into three broad categories, below. Each category is designed to support measurement without double counting:

- **provisioning services** are those ecosystem services representing the contributions to benefits that are extracted or harvested from ecosystems – focusing on biomass outputs such as agricultural products
- **regulating and maintenance services** are those ecosystem services resulting from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions beneficial to individuals and society – focusing on distinguishing the roles of different ecological processes
- **cultural services**[10] are the experiential and intangible services related to the perceived or actual qualities of ecosystems whose existence and functioning contributes to a range of cultural benefits – focusing on the description of the types of interactions that individuals have with ecosystems, for example whether they take place within or outside ecosystems. The reference list describes five different categories of cultural services: recreation-related services; visual-amenity services; education, scientific and research services; spiritual, artistic and symbolic services; and other cultural services.

Beyond these broad categories, the reference list describes a further category: Flows related to non-use values. This flow relates to ‘Ecosystem and species appreciation’, and reflects the

[8] More information on the revision process can be found at https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision
[9] More resources on each can be accessed at https://cices.eu/resources and at https://www.epa.gov/eco-research/national-ecosystem-services-classification-system-nescs-plus
[10] SEEA EA notes that the label ‘cultural services’ is a pragmatic choice, reflecting the longstanding use of the term in the ecosystem services measurement community. It notes that is not implied that culture itself is a service, rather it is a summary label intended to capture the variety of ways in which people connect to, and identify with, nature and the variety of motivations for these connections (UNCEEA, 2021).

wellbeing people derive from the existence and preservation of the environment for current and future generations, irrespective of any direct or indirect use (UNCEEA, 2021).

In simple terms, the SEEA EA establishes standards for the measurement of ecosystem extent (referring to geographic size) and ecosystem condition (referring to the quality and health of the ecosystem asset). The extent and condition are, together, crucial to the ecosystem services that can be provided by the ecosystem to the economy and society, more generally, and with this flow of benefits contributing to the wellbeing of individuals and of society (Figure 3-2).

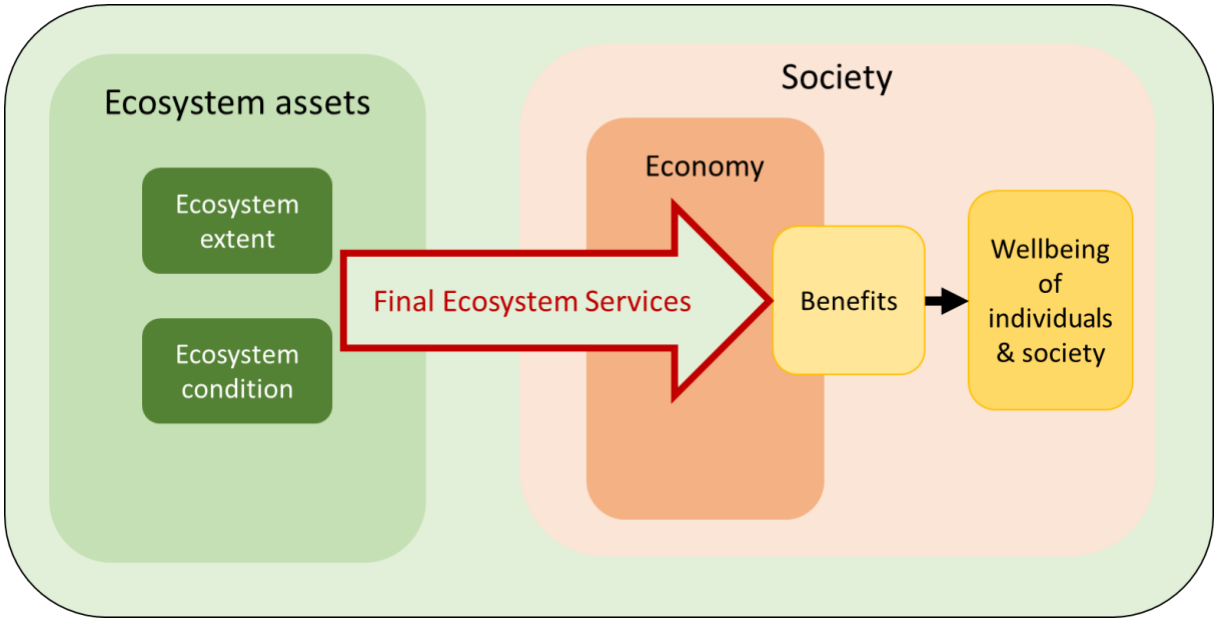


Figure 3-2. The System of Environmental-Economic Accounting – Ecosystem Accounting general ecosystem-accounting framework adapted from: SEEA Committee of Experts on Environmental-Economic Accounting (2021) System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft, Figure 2.1, page 28 (UNCEEA, 2021).

The SEEA EA is based around five interconnected stock-and-flow accounts, shown in Figure 3-3. The first three are measured in physical units, representing the stock (extent and condition) of ecosystem assets at a particular point in time (the end of the accounting period), and the physical flow of ecosystem services that have been provided by that stock during the accounting period (usually one year). The final two accounts are measured in monetary units; the monetary ecosystem services flow account represents the monetary value of the flow of ecosystem services that has been provided in the accounting period, while the monetary ecosystem asset represents the value of the stock of ecosystem assets at end of that period.

Such accounting, founded on accounting and economic principles, incorporates the perspective that the value of an asset is embodied in the expected future flows of services from that asset. Formally, the monetary value of an ecosystem ‘asset’ at the end of an accounting period represents the net present value of the associated expected future flows of ecosystem services emanating from that asset. The stock accounts thus represent a store of flows into the future. Accordingly, changes in asset values brought about by changes in

ecosystem condition (e.g. enhancement, degradation or conversion) are also incorporated within the accounts.

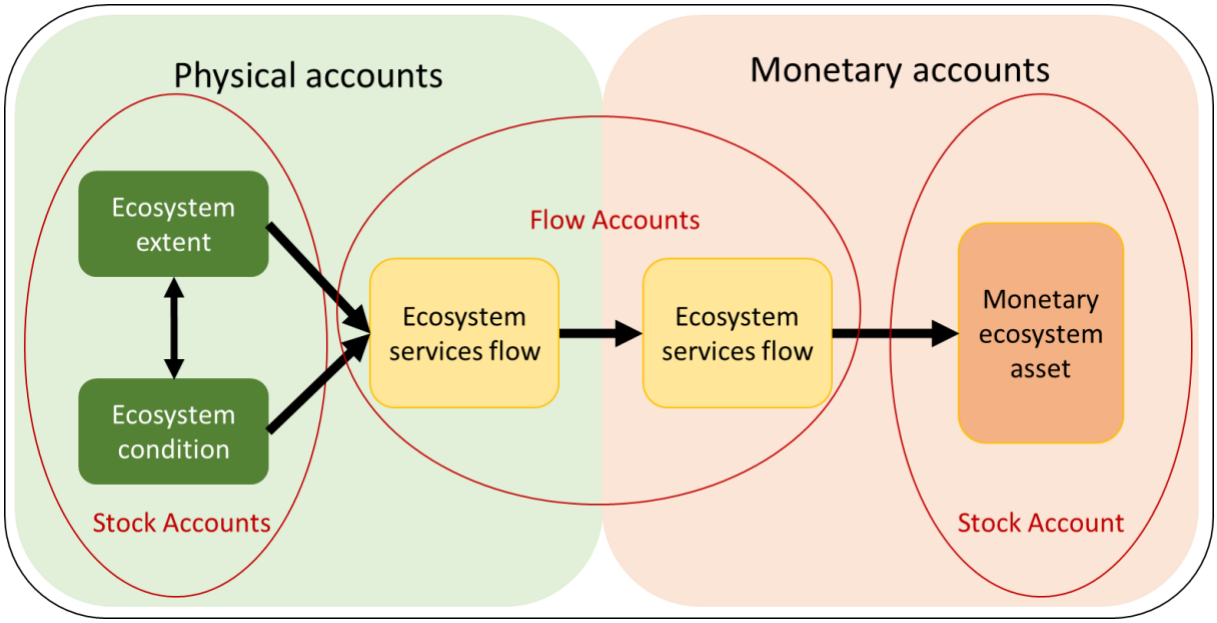


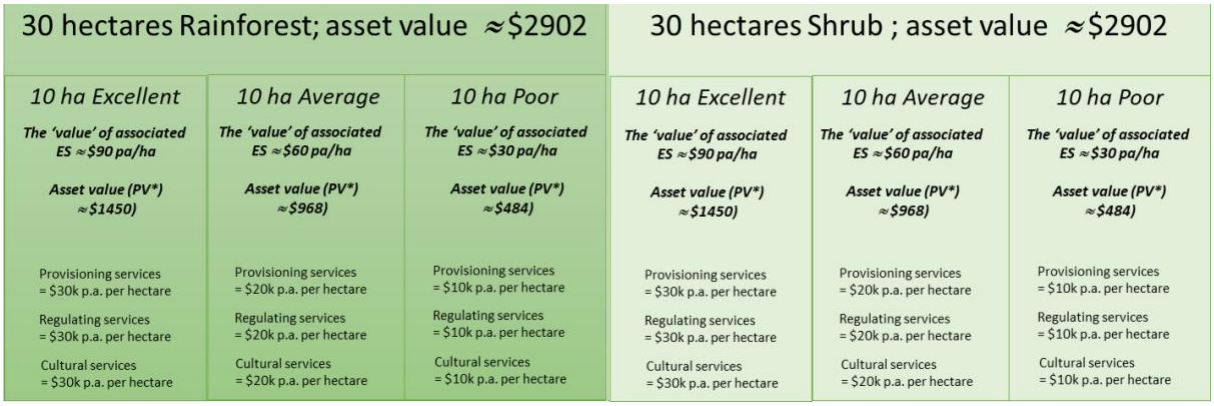
Figure 3-3. Connections between the ecosystem accounts adapted from: SEEA Committee of Experts on Environmental-Economic Accounting (2021) System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft, Figure 2.2, page 44 (UNCEEA, 2021).

3.1.4 Monetary valuation of ecosystem service flows and ecosystem assets

Notwithstanding the many 'real-world' complications associated with measuring ecosystem extent, condition, service flows or values, the different accounts identified and connected in Figure 3-3 map a pathway for the monetary valuation of both flows and stocks/assets. A stylised example is given in Figure 3-4(** numbers hypothetical; asset value calculations assume a 30-year time horizon and a 5% discount rate.)

Figure 3-4 (hypothetical numbers only):

- Step 1: estimate the number of hectares of different types of ecosystems (ecosystem extent)
- Step 2: assess the condition of those ecosystems
- Step 3: estimate the value of ecosystem service flows that are associated with those types of ecosystems (in that condition)
- Step 4: calculate asset values as the present value of the flow of ecosystem services.



(** numbers hypothetical; asset value calculations assume a 30-year time horizon and a 5% discount rate.)

Figure 3-4. Stylised representation of the way in which information about ecosystem extent and condition can be combined with information about the value of ecosystem services generated from different ecosystems, and can be used to generate estimates of asset values.

Step 3 is a critical socioeconomic step in the process, converting biophysical measures of ecosystem extent and condition into monetary values. There are numerous non-market valuation tools regularly used to assess the monetary value of different types of ecosystem services (Bennett, 2011; Freeman III, Herriges, & Kling, 2014; Getzner, Spash, & Stagl, 2004; Pascual et al., 2010). However, these tools are mostly grounded in micro-economic theory utilising partial equilibrium approaches. While they are particularly well suited to the task of assessing the value of simple individual goods and services (such as commercial fishing or logging), they struggle to estimate ecosystem service 'values' in settings where market equilibrium cannot be assumed or in settings where an asset provides multiple benefit streams which are inseparable with respect to valuation. This is especially problematic from an Indigenous viewpoint, in which *connectivity* is the norm, rather than the exception. The implication is that *partial equilibrium* analysis is inappropriate.

The idea of discounting a flow of ecosystem service values, to generate estimates of asset values is also contentious. Although it is common practice to select a single discount rate and apply it uniformly across all flows into the future, a substantive body of literature suggests that discount rates – particularly *social discount rates* (those associated with non-market goods) – decline over time. Drawing on a survey of more than 2,000 economists, Weitzman (2001) found that even if every respondent has a constant discount rate, the diversity of individual views about what constitutes an appropriate (constant) discount rate, ensures the *effective* social discount rate declines significantly over time. Economists have thus noted that it is preferable to use hyperbolic or quasi-hyperbolic (declining) discount rates (Laibson, 1997) or similarity relations as a substitute for altered functions describing discount rates (Rubinstein, 2003). Costanza, Kubiszewski, Stoeckl, and Kompas (2021) argue that it is also important to use different discount rate (regimes) for different types of ecosystem services.

3.1.4.1 The challenges of ecosystems services accounting on Country

Most relevant to studies undertaken in Indigenous contexts, Weitzman (2001) suggests that what constitutes an appropriate social discount rate depends on the time horizon considered: ≈ 4 % if the time horizon is 1–5 years from now; ≈ 3 % for time horizons in the range of 6–25 years; ≈ 2 % for time horizons in the range of 26–75 years; ≈ 1 % for time horizons in the

range of 75–300 years; and 0% if one's time horizon exceeds 300 years. Indigenous Australians have the oldest living cultures on earth, with temporal perspectives that greatly exceed the 300-year limit after which Weitzman suggests that discount rates fall to zero.

Also problematic is the idea of separately identifying and then 'valuing' different parcels of land. To do so, implicitly accepts that it is possible to identify some parts of Country as being inherently more important (more 'valuable') than others. In many Indigenous cultures, Country is viewed holistically – somewhat like the human body. This is akin to recognising that valuing one part of the body, such as the heart, as more valuable (or more important) than another, such as the brain, is nonsensical as if either organ fails, then so too does the body (Díaz, Pascual, Stenseke, Martín-López, Watson, Molnár, Hill, Chan, Baste, & Brauman, 2018).

Different decision-making processes also give rise to different 'objectives' and suggests different needs for information about 'values'. Western/federal governments seem most concerned with gathering information about the relative value of different parts of the landscape (parcels of land). This suggests that federal governments (and the United Nations) may be implicitly aiming to maximise the value of a portfolio of assets. By contrast, TOs are inherently more concerned with the health of 'their' Country – a single, holistic, parcel of land that is inextricably linked to their people within the social-ecological system that is their Country and culture (Holmes & Jampijinpa, 2013). Knowing whether one part of the Country (the heart?) is more or less 'valuable' than another (the brain?) is not a priority – what matters is knowing how to keep the whole, and therefore both the heart and brain, healthy.

In short, although neoclassical non-market valuation methods have been used across the globe to facilitate the 'valuation' of ecosystem service flows and ecosystem assets, it may not be the 'right tool' in Indigenous contexts (Farr, Stoeckl, Esparon, Grainger, & Larson, 2016). In connected systems (Koch, Yemshanov, McKenney, & Smith, 2009) goods and services are not entirely separable. For example, when you need a car to access land, market and non-market goods inter-relate (Carbone & Smith, 2013); and/or when good and services do not only infer benefits upon individuals but generate a complex array of interactive benefits that accrue more broadly to community – termed *complex social goods* (Stoeckl et al., 2018).

This means, in seeking to determine the 'value' of ecosystem services to Indigenous communities (and the value of Indigenous care for Country to ecosystems), valuation methods may be needed that:

a) consider entire landscapes rather than component parts. Western approaches tend to disaggregate and then add to estimate total values – e.g. identifying different services provided by different parts of Country (includes land, coastal and sea Country), monetising each separately and then adding. The literature suggest that it may, instead, be better to consider the entire landscape as a 'bundle'; crudely analogous to considering the value of a meal, rather than the value of each of its component parts such as food, drink, good company.
b) value/prioritise activities that do the most to enhance whole-of-landscape health, rather than seeking to value/prioritise different parts of the landscape (such as prioritising land management practices which are intended to preserve and maintain entire landscape values (as per the point above) – rather than prioritising (parts of) the landscape).

c) provide opportunities for Indigenous communities to collectively determine values/preferences, rather than assuming that community values/preferences can be estimated by eliciting and then aggregating the values/preferences of individuals.

It is important to step back to reflect on differences in world views and decision-making processes before deciding on how best to tackle the challenges of incorporating Indigenous cultural connections into the SEEA accounts.

3.2 Accounting for what and for whom?

The material presented below summarises key parts of a more complete analysis, reported on in: Finau, G., Stoeckl, N., Jarvis, D., Larson, S., Ewamian Aboriginal Corporation, Barrowei, R., Coleman, B., Groves, D., Hunter, J., Lee, M., Markham, M., Douglas, M. (In review) Accounting for Indigenous Cultural Connections to land: Insights from two Indigenous Groups of Australia

Creating an accounting system that incorporates cultural connections to Country for Indigenous Australians is a complex task, as any accounting of/for culture involves the recording, capturing and interpretation of a culture (Gallhofer, Gibson, Haslam, McNicholas, & Takiari, 2000). This can be further complicated if the accounting of a culture is undertaken by people who come from outside that culture (Lombardi, 2016). Some may argue that such an endeavour is futile (Solomons, 1991). However, we live in a world in which technologies such as accounting permeate our everyday life, either directly or indirectly (Hopwood, 1983; Tinker, 1991). At its heart, accounting is a tool that facilitates collective decision-making about the stewardship of resources (McNicholas & Barrett, 2005).

The Australian Government increasingly recognises the economic rights of Indigenous Australians and encourages their economic participation. The accounting of Indigenous cultural connections recognises the multi-faceted value of Country. This is a positive step towards recognising and appreciating Indigenous Australians' worldviews and connections to Country and to integrating them within the national accounting system. However, no system of accounting is perfect. What we choose to account for is based on what we believe needs to be measured or made visible at that point in time; and different people will hold different views about what 'needs' to be measured (Hopwood & Miller, 1994). Moreover, the very process of accounting for 'things of value' may begin to reveal other 'things of value' that were initially omitted. The development of any system of accounting, especially for a group of people for whom western-based systems of 'valuing' ecosystem services are the antithesis of their holistic views, needs to be an iterative, consultative and collaborative process (Gallhofer et al., 2000). This project is one step on a longer journey that may lead us in a different direction to that which was initially envisaged.

Culture is a socially constructed practice and resides in the minds of people (Bourdieu & Passeron, 1990). In this project, it is the distinct cultures of the many Indigenous Australian peoples and their connections to land (their Country) that we are trying to account for. However, this accounting was not initiated by Indigenous Australians, but by the Australian Government. The accounting is intended to inform the government about ways of potentially incorporating cultural connections to land within the national accounting system, a system that is, in turn, aligned with the SEEA system. This involves the melding of three worldviews (Figure 3-5) from the local (Indigenous worldviews) to the national (government accounting) and to the global (SEEA).

Figure 3-5. The melding of three worldviews.

The melding of these worldviews means that some of each of their aspects must be omitted/adapted/integrated into the final accounting system. The choice of what is (dis)counted, what is made (in)visible and whose voices are (de)amplified is determined by those who develop the system of accounting. As researchers, we must be aware of our positions of power and the dual responsibilities that we have to the government (as initiators of the project) and to the Indigenous groups (as, ideally, beneficiaries of the project). The funding arrangement for this project produces a power structure that positions the government at the top and our Indigenous partners at the bottom. However, for the purpose of the design, development and implementation of the project, we inverted the power structure. (Figure 3-6).

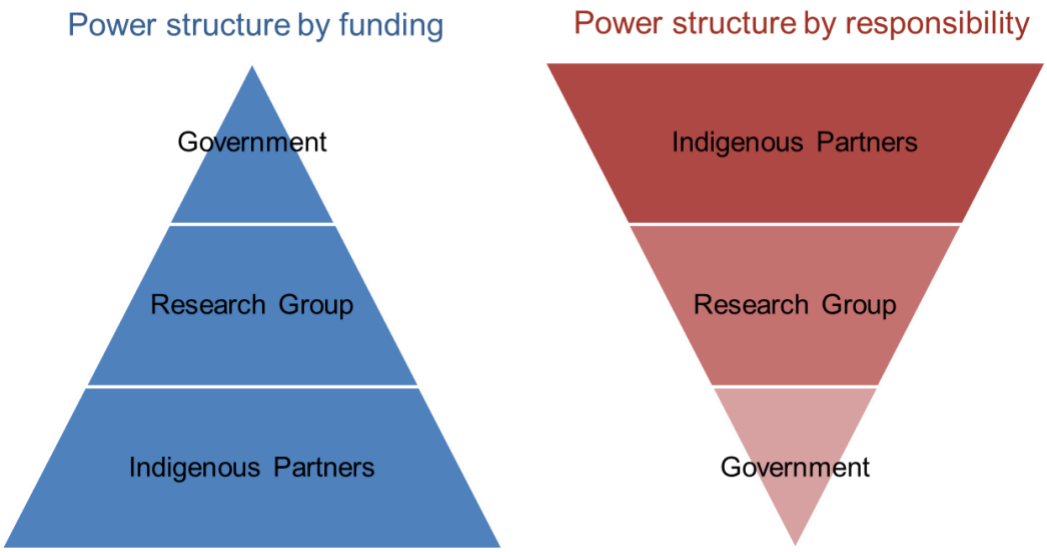


Figure 3-6. Power structure based on funding and responsibility (to Traditional Country).

The inverted power structure above is based on a moral responsibility to Indigenous Australians to privilege their views in the accounting system. The goal is not merely the inclusion of Indigenous Australians in the design/development/implementation of the accounting system, but empowerment and self-determination. If our partners feel the

resulting system/s incorporate their worldviews, then they will most likely use it to make decisions. Ultimately, we hope that many groups of Indigenous Australians will be able to develop their own, context specific accounting systems entrenched in their values, practices and connections to Country, with possible support from government and researchers.

Seeking to capture and reduce to a numerical value the rich and complex relationships between any people and their culture is fraught with risk, given the limitations of non-market valuation methods of accounting and even general recording methods (e.g. writing, enumeration). Consequently, we first sought to better understand how our Indigenous partners, the Mungguy people of Kakadu National Park and the Ewamian Aboriginal Corporation, QLD, viewed their own cultural connections to Country. We then sought to learn more about the activities/actions which our Indigenous partners would prioritise for support (enhancing their 'value'). We then reflected on the way in which the activities, actions and issues raised might (or might not) be used to identify variables that could be included or considered alongside the SEEA accounts, to better take into account Indigenous cultural values.

From this process, detailed in Sections 5 and 6, we created an accounting approach that **enables Indigenous cultural connections to, and the sustainable management of, Country to be 'valued' alongside emerging environmental-economic accounts that attribute a monetary value to ecosystems services.** This method can be used as a template for accounting for the cultural connections to Country of diverse Indigenous peoples, by identifying and incorporating the local priorities and variables unique to each community. We recommend that the approach be further tested with other Indigenous groups to confirm the conclusions and recommendations drawn from our work described within this report.

4. Our partners

We partnered with two Indigenous groups, the Ewamian people of northern Queensland, through the Board of the EAC and the Mungguy TOs from the southern part of KNP. With each of our partners, a multi-day workshop was held on (or close to) their traditional Country to explore their cultural connections to their land, and the activities and projects they currently engage in, or would like to engage in, in future (Table 4-1).

Table 4-1. Summary details of our partners for this research and of the workshops held with our partners.

Partner	Board of EAC	Mungguy Traditional Owners
Language group	Ewamian	Jawoyn
Geography	Traditional lands located in north Queensland Significant populations of Ewamian people in north Queensland, Brisbane and Cherbourg Few Ewamian live on traditional Country	Traditional lands located in and around the southern region of KNP, Northern Territory Mungguy mainly live close to KNP, within the Victoria–Daly and Katherine regions
Clans represented at workshop	Ewamian	Yurlkmanj, Wurrkbarbar and Bolmo
Workshop date and location	8–10 October 2019, Talaroo Station, Queensland	17–18 February 2020, Pine Creek, Northern Territory
Workshop participants	Two women and three men	Two women and four men

4.1 Ewamian people and the Ewamian Aboriginal Corporation Board

This research was co-developed and conducted in partnership with the EAC Board[11]. The Country of the Ewamian people is located in Queensland's Gulf of Carpentaria savanna lands in the upper Gilbert and Einasleigh River catchments, and takes in the townships of Georgetown, Forsyth, Einasleigh and Mount Surprise. It primarily lies within the Etheridge Shire Local Government Area.

During the expansion of European settlement in the region in the late 19th century, Ewamian People were 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 nineteenth 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 stockman 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 (Figure 4-1a).

[11] For further information regarding the EAC, see https://www.ewamian.com.au

Panel (a)

Panel (b) from left to right Daniel Grainger, Brian Bing, Ken Georgetown, Sharon Prior, Natalie Stoeckl, Jenny Lacey, Barry Fisher, Diane Jarvis

Figure 4-1. (a) 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. (b) Participants of the workshop on Ewamian Country.

The 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^2 in 2013. In 2012, the Indigenous Land Corporation purchased Talaroo Station (315 km^2 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. The EAC signed a lease with the Indigenous Land Corporation to manage Talaroo Station as an Indigenous Protected Area (IPA), and in 2014, Talaroo Station was officially declared a Nature Refuge.

Since their Native Title application, the EAC Board have demonstrate a clear vision for the sustainable future 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 to develop the Talaroo Tourism Project/Venture for their collective benefit. In July 2021, the Talaroo Hot Springs opened for visitors.

The EAC is ably led by their Board, with membership drawn from Ewamian people located in both Queensland's north and south-east, and by their General Manager. Given the long-term collaborative research partnership between the EAC and researchers, developed through previous projects (Addison et al., 2019; Jarvis et al., 2021; Larson et al., 2020; Larson et al., 2019), the research team was delighted the EAC Board expressed an interest in partnering and co-developing this project.

We partnered with the EAC Board to co-develop a workshop designed to learn more about Ewamian views on 'connections to Country' and the links (or otherwise) to western notions of ecosystem services, and to leverage those insights to suggest ways in which SEEA might incorporate Indigenous cultural values. The workshop was held on the traditional Country of the Ewamian people at Talaroo Station in October 2019 (Figure 4-1).

4.2 Mungguy people of Kakadu National Park

Kakadu National Park is a living cultural landscape with exceptional natural and cultural values. It was inscribed on the World Heritage list in 1981 in recognition of these outstanding universal values. The park's boundaries were subsequently extended in 1987 and 1992[12]. KNP is, and always has been, Bininj/Mungguy land. The term 'Bininj/Mungguy' is used to refer to the traditional Aboriginal owners of Aboriginal land in the park (within the meaning of the Aboriginal Land Rights (Northern Territory) Act 1976) and other Aboriginal people entitled by Aboriginal tradition to use or occupy land in the park (whether or not the traditional entitlement is qualified as to place, time, circumstance, purpose or permission) (Kakadu Board of Management, 2016).

The Creation ancestors gave Bininj/Mungguy a kinship system linking people to all things and the cultural responsibility to look after them all. They have deep understanding of their Country and their traditional ancestral knowledge is a vital part of managing Kakadu's rich environment (Kakadu Board of Management, 2016). Kakadu National Park has been home to Indigenous peoples for more than 50,000 years. However, since the establishment of KNP, Kakadu's TOs have leased their land to the Director of National Parks to be jointly managed as a national park by the Bininj and Mungguy peoples and the Australian Government, represented by Parks Australia (Kakadu Board of Management, 2016).

Tensions recently emerged between Parks Australia and TOs over this joint-management arrangement. They escalated in July 2020 (four months after our data collection took place) with a vote of no confidence in senior management by the Board and TOs due to the degradation of the natural environment and inadequate funding for rangers and maintenance. Changes are in progress, including the appointment of new executives, the appointment of a TO as one of two new park managers, an increase in the number of members on the Board from 15 (eight of which were TOs) to 21 (15 of which are TOs), and the commissioning of a senior advisory group to re-assess the parks' joint-management model.

The TOs of the Kakadu region, the Mungguy TOs in the south and Bininj TOs in the north, are culturally diverse, drawn from around 19 different clan groups and 12 language groups. Bininj/Mugguy peoples were invited to participate in this research project. After explaining the research aims and objectives to the Kakadu Indigenous Research Committee during a meeting in October 2019, TOs expressed an interest in participating. The Bininj/Mungguy TOs made it clear that cultural connections to Country should not be explored and discussed for the Kakadu region as a single entity. Rather, TOs from the different clans/language groups should talk separately about their connections to their own specific Country. Importantly, only the 'right' people could talk about a particular place or cultural connection.

It was agreed that the Mungguy TOs would participate in the project first, working with researchers to explore their connections to the southern part of KNP. Further workshops would then be held with Bininj people, whose Country includes the central and northern regions of KNP. However, as COVID-19 restrictions and the increasing tensions between the joint managers of KNP coincided, these later workshops could not take place. Consequently,

[12] See http://whc.unesco.org/en/list/147

the research detailed in this report relates only to our partnership with Mungguy peoples. The findings and connections cannot be generalised as representing Bininj people or be taken as representative of connections to KNP as a whole.

Our partners for the Mungguy case study, were drawn from three clans from within the Jawoyn language group (Figure 4-2). For the Mungguy peoples, Buladjang, or 'Sickness Country', is a particularly important area. The Jawoyn people believe that powerful creation ancestors rest here including Bula, the Rainbow Serpent. The 'Sickness Country' extends over 2,000 km^2 and coincides with high concentrations of uranium, thorium, arsenic, mercury, fluorine and radon in the water and air, which are leached from rocks in the region. Strict rules and protocols govern access to many sites and, traditionally, women and children have been banned from entering those areas. Since Jawoyn people won their first land claim of Nitmiluk in 1989, they have become the recognised TOs in the Katherine region, western Arnhem Land and the southern area of KNP. The Mungguy have strong cultural ties with the Mary River region as well as the nearby Nitmiluk National Park.

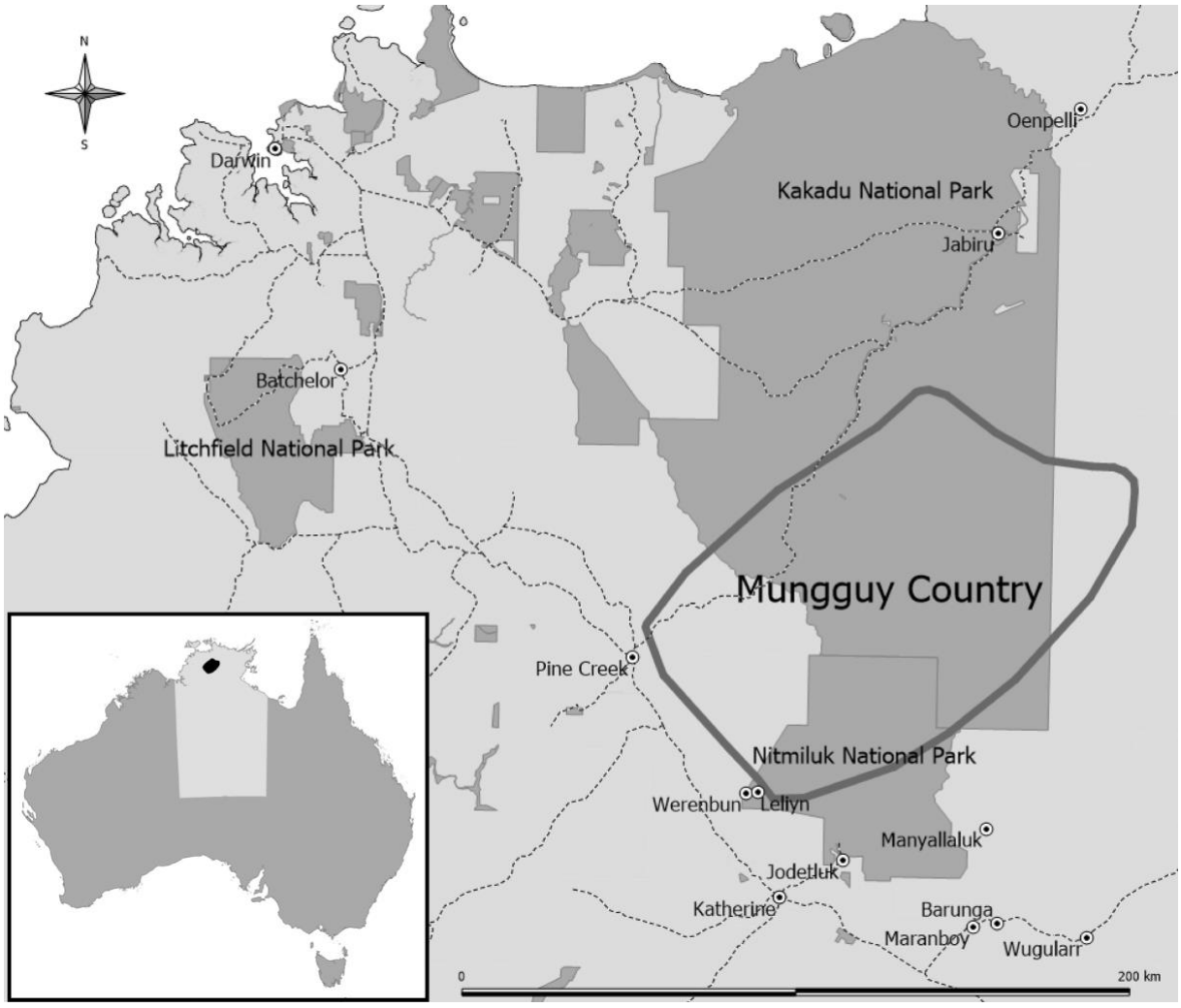


Figure 4-2. Map showing traditional Country of the Mungguy Traditional Owners as indicated by members of the Yurlkmanj, Wurrkbarbar and Bolmo clans that participated in this project. The indicated area is not intended to represent Native Title areas and is designed to roughly indicate rather than precisely identify the Country of the project participants.

5. Insights from the Ewamian Aboriginal Corporation

The material presented in Sections 5.1, 5.2 and 7.1 summarises key parts of a more complete analysis, reported on in: Stoeckl, N., Jarvis, D., Larson, S., Larson, A., Grainger, D., Ewamian Aboriginal Corporation (2021) Australian Indigenous insights into ecosystem services: Beyond services towards connectedness – People, place and time, *Ecosystem Services*, 50, https://doi.org/10.1016/j.ecoser.2021.101341

Further analysis of the materials within Sections 5.1 and 5.2 is reported within Grainger, D., Stoeckl, N., Jarvis, D., Ewamian Aboriginal Corporation (In review) A simple test for sustainability, and within Jarvis, D., Stoeckl, N., Larson, S., Grainger, D., Larson, A., Ewamian Aboriginal Corporation (In prep) Australian Indigenous reciprocal notions of Caring for Country, and Country caring for you: do we need to put caring for people first?

5.1 Ewamian workshop – overview

We partnered with the EAC Board to co-develop a workshop designed to learn more about Ewamian views on 'connections to Country' and the links (or otherwise) to western notions of ecosystem services, and to leverage those insights to suggest ways in which SEEA might incorporate Indigenous cultural values. The workshop was held on the traditional Country of the Ewamian people at Talaroo Station in October 2019 (Figure 4-1).

During the two-day workshop, five members of the EAC Board and three western-trained scientists co-designed four related activities. Our first step was to encourage EAC Board members to develop their own models of connections to Country. We were careful not to begin with a description of ecosystems services or of EEA EA, to avoid 'leading' discussions. The activities are briefly outlined below:

Activity 1. *Stories about people's connections to Country*. Board members 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, which were subsequently grouped into 'themes', with arrows used to show the way in which the themes were connected (Figure 5-1).

Figure 5-1. During the storytelling sessions, important aspects and flows were also recorded on sticky notes by board members.

Activity 2. *What people do for Country*. Board members were asked to describe the management activities, priorities and actions undertaken to best protect the connections spoken about during Activity 1. As for Activity 1, key concepts were first written on post-it

notes, and then grouped into themes, with arrows used to show connections between the themes.

Activity 3. *Combining insights from Activities 1 & 2 to develop a 'mental model'*. Board members were asked to talk about the way in which the ideas/concepts developed in the first two activities fit together – effectively blending the two models into one. They were also asked to talk about whether they were satisfied/happy with different parts of the system or mental model they had developed.

Activity 4. *Introduction ecosystems services*. Researchers introduced the concept of ecosystem services, providing examples of different types of services (with 10 cards providing visual examples, selected based on services included in the SEEA EA[13]). Board members were asked to fit these cards into their narrative as appropriate, and to also add any additional ecosystem services they considered important.

Activities 1–4, together, generated a conceptual model showing the way in which the EAC Board viewed connections to Country, and links to the concept of ecosystem services.

Activity 5. *Synthesising insights*. Researchers synthesised information from Activities 1–4 and presented the results to EAC Board members to check for completeness and accuracy. Board members were then asked to identify and subsequently prioritise projects/activities that could be undertaken to strengthen/improve their connections to Country, activities on Country and other components included in their conceptual model.

All workshop sessions were recorded (with permission) and transcribed. Two researchers independently analysed the transcripts to identify emergent themes.

5.2 The Ewamian Aboriginal Corporation model of the nature–people relationship

The workshop generated an EAC mental model of nature as a system inseparable from people, that provides goods to people in a complex way, and is managed by people on a whole of the landscape basis. This is the essence of the EAC nature–people relationship. As one participant explained: 'And I guess if any of these bits fail, Country isn't cared for and people aren't cared for. You need to balance everything.'

Key insights emerged including:

- The importance of temporal perspectives, focusing on three distinct time frames.
    - **Pre-colonial times** were characterised by people practicing their culture on their Country and being able to fulfil their cultural obligations as stewards of their land. During this period, people and Country were healthy and inseparable, as depicted in Figure 5-2 by people and Country together with

[13] UN SEEA Ecosystem Accounting project: https://seea.un.org/events/expert-meeting-advancing-measurement-ecosystem-services-ecosystem-accounting

smiley-face emojis (which could be considered as the SEEA EA reference condition[14]).

- **Present**. Today's circumstances reflect the Ewamian peoples' colonial era experiences. They were removed from their lands, and consequently were unable to practice their culture on their lands. This separation of people from Country was seen as having adverse impacts on both the wellbeing of the Ewamian people and to the health of their Country/environment, as depicted in Figure 5-2 by people being moved away from Country and unhappy-face emojis.
- **Desired future.** The key objective in the post-colonisation period was for people to be brought back together with their Country, as depicted on the right in Figure 5-2 with smiley-face emojis), thus crossing the 'post-colonial bridge' and returning the system to a *'healthy people, healthy Country'* state.

Figure 5-2. Left panel depicts past and present condition of people and Country; Right panel depicts the desired future.

- The richness, reciprocity and interconnectivity of the Ewamian (EAC) model of the nature–people relationship.

While ecosystem services are a component of the EAC model (e.g. different types of provisioning and cultural services were provided as examples of 'activities', such as fishing), their model considers much more. Feelings and spirituality are central, and stewardship activities are highlighted, not only as means of improving the environment, but also as ways of directly improving community wellbeing. Critically, the EAC model is not 'atomistic'. That is, it does not identify separable parcels of land, separable ecosystem services, or individuals rather than community; it focuses primarily on relationships and connections between and within people and Country. While the SEEA EA is based on a linear concept in which the extent and condition of ecosystems determine their ecosystem service flows, and thus their values, the Ewamian model has

[14] SEEA EA define the reference condition as that 'against which past, present and future ecosystem condition is compared to in order to measure relative change over time' (UNCEEA, 2021, p. 337), typically taken to be a pristine, healthy and/or undeveloped condition.

feedback loops. Country cares for people (in providing ecosystem services) but people also care for Country (and benefit from doing so).

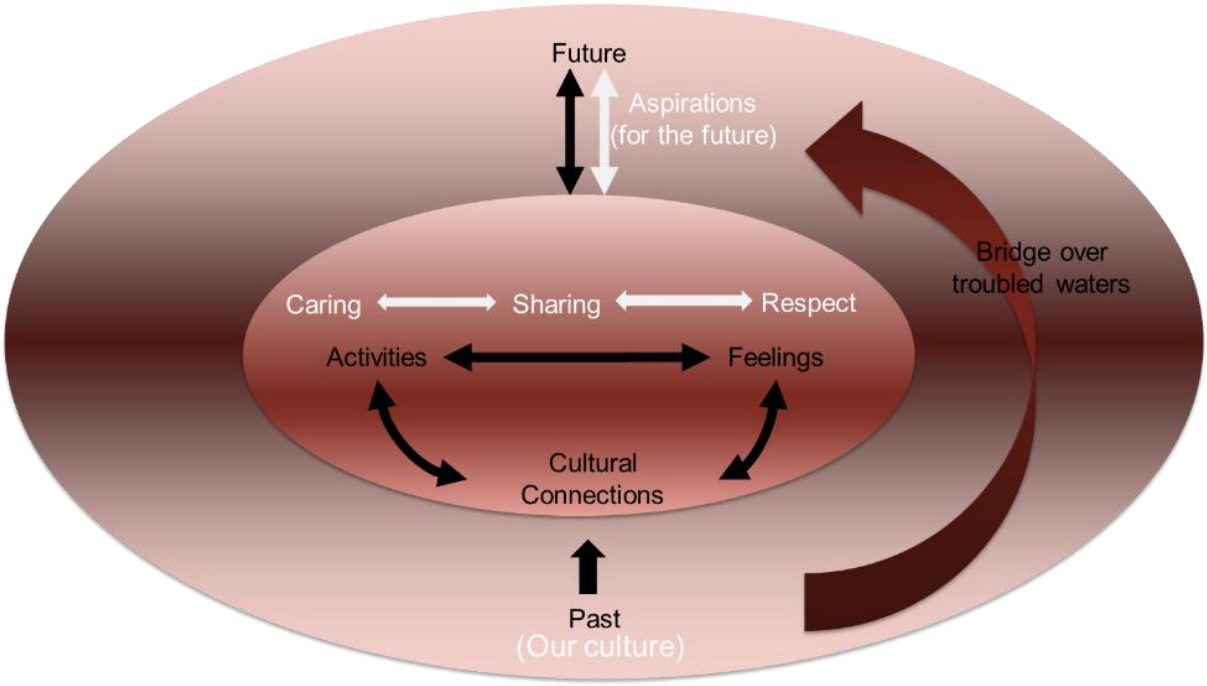


Figure 5-3. Mental map of the key themes discussed when talking about (a) 'connections to Country' – black text; and (b) 'what people do for Country' – white text; arrows represent directions of connections between the themes. Six themes in the oval are all closely connected, and placed in a temporal dimension from past, over present, to the future.

Discussions during the activities and workshop enabled us to identify – and to cross reference with the literature – key issues relevant to determining if Indigenous connections to Country can be 'captured' or 'valued' within or alongside the SEEA EA and/or related accounting frameworks.

- **Time frames**. Temporal perspectives were evident in all discussions, with many conversations focusing on changes to people, Country and relationships over time (specifically, with colonisation removing people from Country). Time horizons were considerably longer than those commonly considered by western scientists, as Indigenous peoples' histories date back at least 60,000 years, and their connections to Country hold within them the all-important link (or continuous thread) to their ancestors). This implies that Indigenous values should not be subjected to *discounting*. The literature provides evidence that *social discount rates* are lower than private discount rates and decline over time, implying high, or consistent discount rates should not be used for all goods and services (Costanza et al., 2021; Laibson, 1997; Rubinstein, 2003; Weitzman, 2001). With time horizons that span multiple generations, **discounting should not be used for Indigenous cultural values.**
- **Interconnectivity**. Interconnections are the norm, not the exception. In line with previous researchers, we found that ecosystem services are part of the story (Lyver et al., 2017), but only a part. It was clear Indigenous cultural values cannot be viewed as a component of, or even 'special case', within the cultural services described in the Common International Classification of Ecosystem Services (CICES) v5.1 (Haines-Young & Potschin, 2018). Indigenous cultural values are intermingled with other

services, including provisioning and regulating services. Moreover, the services Indigenous people provide to Country when caring for it, might even be seen as a type of regulating service or as a service that enhances the capacity of Country to provide regulating services. This is consistent with research demonstrating that ecosystem services are, in some cases, co-produced by humans (Costanza et al., 2017; Jones et al., 2016; Raymond, Giusti, & Barthel, 2018). **Indigenous cultural values must be considered as a 'bundle' of goods and services, not something that can be broken down into component parts and added up.**

- **Valuing the whole.** Individual values are key in western societies, but not in many Indigenous societies (Gould, Pai, Muraca, & Chan, 2019; Graham, 1999) or in other cases where altruism is strongly present (Camerer & Thaler, 1995; Grainger & Stoeckl, 2019). It is likely **inappropriate to value Indigenous cultural services at an individual level** and is, likewise, inappropriate to estimate values for an entire community by aggregating individual values.
- **Reciprocity.** Ecosystem services enhance wellbeing, but so too do stewardship activities, as do other related activities such as volunteering (Black & Living, 2004; Choi & Kim, 2011; Molsher & Townsend, 2016).
- **Tracking expenditure**. Keeping track of spending on various types of environmental protection and resource management activities in Environmental Protection Expenditure Accounts (United Nations, 2014a) is insufficient to determine the real worth of these efforts. Understanding *how* activities are undertaken, and by *whom* is critical. Managing Country by, for example, controlling weeds, is not enough. What matters is the way the weeds are controlled (including using traditional knowledge and traditional practices) and who controls the weeds (TOs). The way in which one behaves when out on Country, and the way in which one cares for Country is crucially important, not only for the wellbeing of Country, but for the wellbeing of people.

5.3 Ewamian Aboriginal Corporation model and the prioritisation ('valuation') of projects and activities

The Ewamian model of the Country(nature)–people relationship differed markedly from the assumptions that underpin the SEEA EA, on which Australia's emerging national environmental accounts are based. The SEEA EA framework is a linear model, in which the size and condition of a particular natural area and its ecosystems determines the flow of 'services' to people (Figure 3-2 and Figure 3-3) and, hence, the dollar value of the various benefits – that range from food, fresh water, fibre and resources to carbon capture, erosion control and recreation. However, Indigenous communities see people as an integral part of complex, interconnected ecosystems and consider stewardship of the environment, or care for Country, a reciprocating relationship. Within this holistic, circular model, Country cares for people, and hence delivers ecosystem services, because people care for Country. People who care for Country benefit both directly (as when volunteers feel better about themselves, by looking after others) and indirectly (since a healthier Country will generate more ecosystem services).

This suggests that if the purpose of SEEA EA ***accounting*** is to monitor the long-term state/health of the nature-people system, then one may need to ***account for*** more than just the state of the ecosystem (and the values of the flows derived from it). Activity 5 generated insights to inform this discussion.

5.3.1 Activity 5: Synthesising insights – key insights

Prioritising projects for 'healthy people, healthy Country': The EAC Board developed, discussed and prioritised a list of the projects that would be important to the Ewamian people to would enable the system to achieve a 'healthy people, healthy Country' state. The projects sought to regain/rebuild cultural connections to the Country, their desired future. However, the board members made it clear there were fundamental socioeconomic challenges and obstacles to overcome before the Ewamian people could begin to properly care for Country. The discussion of challenges and identification and prioritisation of projects were, therefore, undertaken in **two rounds**.

Round 1 focused on the key issues of Indigenous disadvantage and the ongoing impacts of colonisation, with projects proposed and prioritised that could address social ills and build a 'bridge over troubled waters'.

The projects and their final rankings from the first round are shown in Table 5-1. Each of these projects sought to address a fundamental social problem and to help rebuild the social capital and the human capital of the Ewamian people. The Board did, however, recognise that many of the problems addressed also affect non-Ewamian (and non-Indigenous) people.

In addition to the eight projects proposed and ranked by the EAC Board, the researchers also proposed a project that would deliver individual financial benefits to members of the Ewamian community. This was designed as comparator for ascertaining the relative value assigned to the EAC projects in the combined view of the board members. After some discussion to reach agreement on an appropriate payment vehicle, the group settled on a project that would pay $100 per week to each Ewamian household as a rebate on living expenses (food, rent, etc.).

Table 5-1. Ranked projects round 1 – addressing social ills.

Final Rank	Project	Description (direct quotes from Ewamian participants indicated by quote marks)
1=	Education Ewamian way	Two-way cross-cultural education, seeking to encourage young children to better engage with the education system 'bringing a new generation of change' while also 'educating white people about black people'
1=	Opportunities	Providing an easier and more accessible route for people to get jobs, create businesses, build a career '… for Indigenous people, it's just too hard'
3	Health	Improving health and improving accessibility to health care outside of major cities
4	Addressing domestic violence, trauma	Addressing the lack of appropriate and confidential counselling and advice, to enable people to move to situations in which they can take advantage of opportunities
5	People finding their identity	Enabling people to 'reconnect to their culture and Country', including enabling people to learn about their culture and to learn their language
6	Housing for Ewamian people	Addressing shortages of suitable housing and overcrowding
7	Role models	Seeking to address the lack of role models, itself seen as a consequence of the cycle of 'bored-ism', domestic violence and trauma
8	Addressing bored-ism	The cycle of bored-ism, in which people drink and take drugs, because they are bored and see themselves as having no alternatives, which leads to crime. A criminal history then, in turn, prevents people from accessing opportunities and the cycle continues. Such behaviours have become entrenched as the social norm, as young people follow their parents. Addressing these behaviours was seen as separate to providing opportunities; a separate project needs to 'break the cycle' by intervening to prevent bored-ism and its consequences

Priority projects in order of their relative importance for the future of the Ewamian people were education, opportunities, health and means of addressing domestic violence. Each of these projects was ranked as more importance than the offer of $100 per week rebate per household. Although this information cannot be used to provide a precise estimate of the 'value' of any of the priority projects, it can be concluded that they are each 'worth' more than $100 per week per (Ewamian) household.

Having theoretically 'solved' the problems by assuming the successful implementation of the top four projects identified to address social challenges – education, opportunities, health and domestic violence – the EAC Board members were then able to identify the next round of projects that they thought would help them reach their desired healthy people-healthy Country sustainable future.

Round 2 assumed people were able to focus on nature–people interactions, with projects proposed and prioritised that could underpin a desired and sustainable healthy people-healthy Country future.

The projects and their final rankings from the second round are shown in Table 5-2. These projects contrasted markedly to those identified in Round 1. Each project reflecting the desire to restore the inseparability of Ewamian people and Country, and to enable them to practice that culture on Country.

Table 5-2. Ranked projects round 2 – achieving a sustainable 'healthy people, healthy Country' future.

Final Rank	Project	Description (direct quotes from Ewamian participants indicated by quote marks)
1	Ewamian Rangers on all Country	Extending the current Ranger program (which cares for Talaroo) to ensure the whole of Ewamian Country is managed appropriately including reintroducing traditional fire management practices (firesticks) across Country
2	Family back on Country	Enabling Ewamian people, including elders and young people, to visit and spend time on their Country
3=	Ewamian businesses on Country	Enabling Ewamian people to establish businesses on their Country, to generate jobs and economic benefits for their people
3=	Cultural activities on Country	Helping more Ewamian people to find and practice their cultural identity – artefact-making (didgeridoos, etc), cultural lore, stories and storytelling, dance
3=	Develop housing on Country	Enabling Ewamian people to spend time living on their Country
6	Leadership on Country	Involving Ewamian in local politics and decision-making, providing a 'voice for our people' thus enabling them 'taking control of our destiny'
7	Rehabilitation of Country	Involving Ewamian in working with others in the region, to appropriately clean up the old mines on Country and to revegetate, thereby caring for Country while also providing business and employment opportunities

In Round 2, the EAC Board members also agreed to include the same payment vehicle used in Round 1, $100 per week to each Ewamian household as a rebate on living expenses (food, rent, etc.). Notably, all projects were again prioritised above the theoretical $100 per week rebate. Again, this information cannot be used to provide a precise estimate of the 'value' of any of these projects, but we can nevertheless conclude that they are each 'worth' more than $100 per week to a (Ewamian) household.

5.3.2 Identifying and understanding contemporary barriers to caring for Country

All the projects identified for Round 1 sought to address social ills which were seen to afflict the Ewamian people, in particular, but others in society, more generally. A clear focus of every project was to build the human, social and institutional capital of the Ewamian

community. For example, ‘Education Ewamian way’ seeks to build connections throughout the community by improving knowledge of their history, stories and language while, at the same time, improving general educational standards.

It was also clear during the discussions from which these proposed projects emerged that the EAC Board were unable to focus on benefits from nature, or providing stewardship services to their traditional lands, until these problems had been overcome. That is, until they had repaired the damage to the social and human capital of their community.

It also seemed clear from discussions, and from the importance of the temporal dimension within the Ewamian story (from the pre-colonial past, through colonisation, to the present in which they are making progress towards rebuilding their cultural connections to Country towards a desired future) that a significant component of the damage to the Ewamian community can be attributed to the processes that separated them from Country.

Ecosystems services provided at any place and time are derived from the natural resource endowments in that location. However, the literature explains that people can only benefit from the endowments it they have entitlements, capabilities (as proposed by Sen (Nussbaum, 2003; Sen, 1976) and access (as explained in Ribot and Peluso (2003) Theory of Access). These theories explain how people can fail to benefit from ecosystem services not because they are degraded or don’t exist, but because they are not distributed to all people who could benefit. A simple illustration of entitlements is provided by Sen: ‘starvation is a matter of some people not having enough food to eat, and not a matter of there being not enough food’ (Sen, 1981, p. 434).

Entitlements are based on formal and informal rights. The distribution of benefits relates to whether they have (or do not have) the rights required to enable them to enjoy the benefits of ecosystem services. With entitlements to natural resources people are also able to build their capabilities (including skills and knowledge) to use and enjoy them. The theory of access advances the literature beyond a focus on property rights and recognises that a broader set of structural and social relations determine who is able to benefits from nature and natural resources: ‘Someone might have rights to benefit from land but may be unable to do so without access to labor or capital. This would be an instance of having property (the right to benefit) without access (the ability to benefit)’ (Ribot & Peluso, 2003, p. 160).

For the Ewamian people, the impact of colonisation, including but not limited to their separation from their Country, resulted in their loss of entitlements and capabilities, and restrictions to their access. Each of these factors prevent (or significantly reduce) the flow of benefits from ecosystems services, acting as barriers to the wellbeing they deliver. Hence, the need for the Round 1 projects to directly address the damage to the Ewamian people’s social and human capital.

The Round 2 projects assumed the required rights and the abilities to benefit from ecosystem services on Country. Many of the projects proposed involved the Ewamian people exercising their stewardship responsibilities as TOs and custodians of their lands, thus strengthening the flow of benefits from people to nature. Thus, **the barriers preventing the Ewamian people from benefiting from the flow of ecosystems services (lack of rights and access) have also limited the flow of benefits back to nature from people caring for Country.**

6. Insights from Mungguy

The material presented in Sections 5 and 6.1 summarises key parts of a more complete analysis, reported on in: Larson, S., Jarvis, D., Stoeckl, N., Barrowei, R., Coleman, B., Groves, D., Hunter, J., Lee, M., Markham, M., Larson, A., Finau, G., Douglas, M. (In review) Piecemeal stewardship activities miss numerous social and environmental benefits associated with culturally appropriate ways of Caring for Country

6.1 Mungguy workshop – overview

We also partnered with the Mungguy people, TOs of the land in the southern part of the KNP (Figure 4-2). Building on the experience gained from the workshop with the EAC, we co-developed a workshop designed to learn more about the Mungguy people's views on 'connections to Country' and the links (or otherwise) to western notions of ecosystem services, and to leverage those insights to suggest ways in which SEEA might incorporate Indigenous cultural values. The workshop was held at Pine Creek (just outside the border of KNP on traditional Mungguy lands) in February 2020.

During the two-day workshop, five members of the Mungguy community and three western-trained scientists co-designed four related activities. We used processes similar to those developed and trialled with the Ewamian people, but activities were tailored to the distinct circumstances, culture and history of the Mungguy people. Like the Ewamian workshop, key concepts/points raised during each activity were first captured on post-it notes, then grouped into themes. The group discussed how the themes were connected – adding arrows to the model to illustrate the connections.

Activity 1. *Stories about people's connections to Country*. The Mungguy TOs were first invited to create their own conceptualisation (mental model) of Indigenous connections to Country.

Activity 2. *What people can do for Country*. We then discussed activities that would strengthen cultural connections and help the TOs look after people and Country. From there, the TOs developed a list of activities/projects that could be pursued to achieve those ends. Participants were asked to individually prioritise projects to best represent the perceived benefits that each project would bring for their people; scores were then combined and the combined scores were shared (individual scores were kept private).

Activity 3. *Social decision-making*. Participants were then encouraged to discuss the projects and the overall scores from Activity 2, enabling deliberative social views to develop. Participants were provided with the opportunity to adjust their scores.

Activity 4. *Strengthening connections to Country.* The 'top' three projects were discussed in relation to the Mungguy conceptual model of the nature-people connected system (Activity 1) to understand how the projects were thought to be able to strengthen peoples' connections to Country.

6.2 Mungguy models and projects

6.2.1 Understanding and strengthening connections to Country

The first mental model created by participants during this session was centred around spiritual connections to the land (Figure 6-1). The spiritual connections were seen as wheels, interlinked to form a three-dimensional sphere. Five themes were identified. They were Cultural places; Being on Country; Looking after Country; and Bush tucker, all of which were linked to a fifth central theme of Spiritual connections to Country and connected to each other (Figure 6-1). A second connected model of historical timelines (Figure 6-2) showed Mungguy cultural connections to Country divided into three distinct time frames: ancient past; recent past to present; and desires for the future. Each of these themes is further described in Table 6-1.

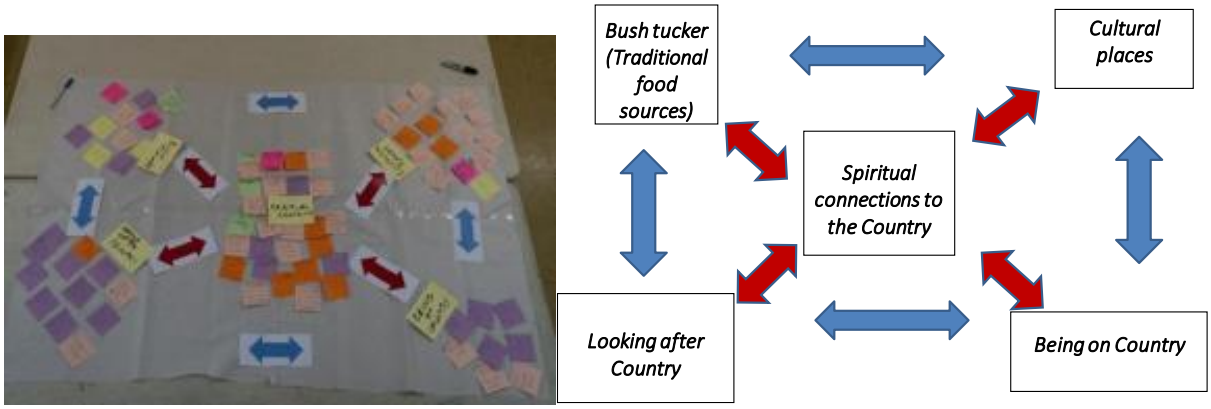


Figure 6-1. Mental model of the connections to the Country as created by Mungguy participants (left) and schematised (right).

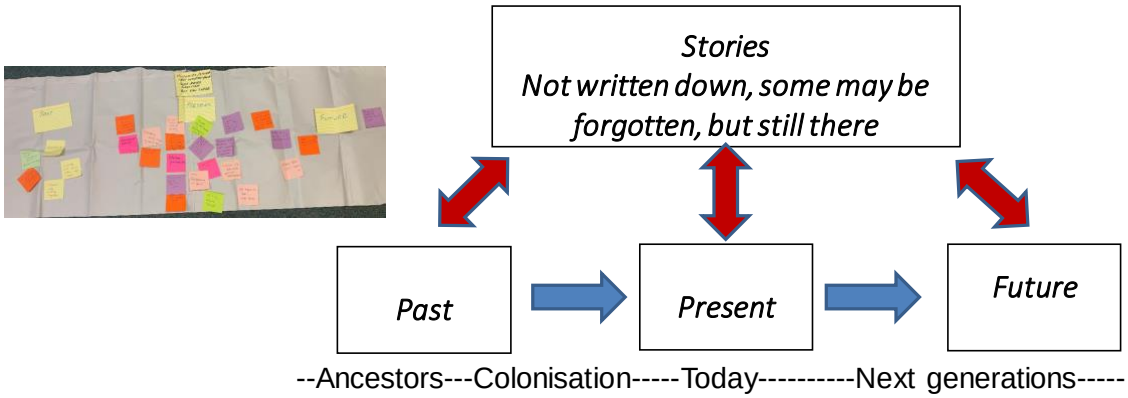


Figure 6-2. Mental model of the timelines, as created by Mungguy participants (left) and schematised (right).

The mental model developed by the Mungguy participants is distinct, but similar to those Indigenous models in the literature and the model developed by Ewamian people. The interconnectivity of all aspects of connection to Country, the central linking theme of spirituality and the holistic approach to people and nature are themes that distinguish

Indigenous models from the western scientific model of disembodiment. Consistent with the Ewamian model and with other Indigenous models reported in the literature, 'the whole' is valued, not its various parts.

However, what constitutes 'the whole' will be different to different people, as it is context and culture specific. This is a critical distinction. This means the use of inclusive approaches that account for diversity of worldviews ('inclusive language and framing', (Kadykalo et al., 2019)), must allow both for similarities between models ('general perspective', values of importance to all, (Kadykalo et al., 2019)) *and* the measurement of values that are unique and context specific ('context-specific perspective', that is, the hybridisation of generalising and context-specific perspectives, (Kadykalo et al., 2019)).

Table 6-1. Description of the cultural connections to Country themes.

Theme	Brief description (direct quotes from Mungguy participants indicated by quote marks)
Bush tucker	One perceived connection to Country was through consumption of traditional food from the land (bush tucker). The spiritual importance of the bush tucker is not just in providing sustenance to the body, it also acts as an important conveyor of traditional knowledge and techniques, and of more general understanding of land and seasons. In the words of one participant, 'Look at the land like Woolworths [Australian supermarket chain] – our food, our survival, a little bit of commercial gain – but you can't damage it'.
Looking after Country	Looking after Country is therefore an essential aspect of connection to the land. The management of pests and feral animals, bushfires, recording and maintaining rock art sites, were all mentioned as essential for the health of the Country.
Being on Country	'Walking round' is seen as important for wellbeing, as well as taking old people back on Country and listening to their stories. One's Country is perceived as the 'most beautiful place' increasing individual and community wellbeing. Not only is being on Country important to its people, it is important to Country – 'Country is getting lonely' if not regularly visited by its Traditional Owners.
Cultural places	There is a wide range of cultural places on Mungguy Country, with more than 3,000 registered sites. These include caves in which groups lived during wet seasons, as well as specific places for men; young men; women; birthing places; rock art sites; and dreaming sites. Country was described as being for men but also made for women. Participants described how 'feelings get stronger in special places', and that 'Country is our churches and our cemeteries'.
Spiritual connections to Country	All of the themes presented above are important building blocks contributing to the spiritual connections to the land. The 'lore' (traditional rules) and 'protocols' that set out appropriate behaviour on the land, as well as stories and knowledge, are passed down from generation to generation: 'pass on knowledge to next generation'; 'spirits still caring for Country and looking after'. An individual's connection to Country and feelings related to it are very strong. In the words of the participants: 'I was born here – I am part of the story', 'Country tells you where to go – feelings tell you to go', 'feelings that grandfathers are here', 'feel history, feel ancestry', 'grandparents still care for Country and care for me', 'Country welcomes you'.

6.2.2 Strengthening connections to Country

Participants discussed steps that would need to be taken to strengthen cultural connections and help look after people and Country. Three main themes emerged from the analyses of the voice recordings and written notes (Table 6-2): Making decisions; Sharing culture; and Caring for Country. There are similarities to the findings from the Ewamian workshop, but due to the different historical experiences that have shaped the present, the Mungguy people put more weight on self-determination, governance and independent decision-making. This supports the findings of Addison et al. (2019) who demonstrated that, in line with Sen's (1999) thesis of development as freedom, Indigenous groups involved in natural resources co-management programs – as the Mungguy are in KNP – conceptualise their development as a path towards control, leadership, empowerment and independence.

By contrast, government stakeholders' vision of development is more closely aligned to Sen's conceptualisation of capabilities, in which the aim is to increase human and social capital, thus focusing on the relative uptake of jobs or training (Addison et al., 2019).

Participants stressed the need to 'Respect the land' and 'Share Country the way we want to share it'. There were suggestions of 'Walking with Parks' so that Parks Australia staff can 'Understand Country' and 'Listen to Aboriginal culture and Aboriginal land protocols'. Opinions were also voiced that 'Parks should do what the Traditional Owners tell them', and 'We should be doing things ourselves, not relying on Parks'. Participants also discussed the need for greater collaboration on behalf of Parks, in which TOs are part of an employment scheme and have access to the infrastructure of Parks; securing maintenance and management contract from Parks; the establishment of an Indigenous ranger group; and receiving more training.

6.2.2.1 The 'right people' caring for Country the 'right way'

An important emerging theme was the importance to TOs of not only **what** is done on the land, but also **who** does it and **how** is it done: 'just the right people can go' and 'Rock art maintenance needs to be done by the right people'. In words of participants, 'Where, how and who cares for Country matters'; [it is] 'Not just what you do, but how'.

Table 6-2. Themes emerging from the discussion on what would strengthen cultural connections and help look after people and Country.

Theme	Sub-theme
Making decisions	
Sharing culture	- with young people - with others
Caring for Country	- Managing, using traditional knowledge - Monitoring, using traditional knowledge - Activities - Logistics

6.3 Mungguy model and the prioritisation ('valuation') of projects/activities

6.3.1 The prioritisation of projects to care for Country

Discussions about connections to Country, and ways of strengthening the connections (Activities 1 and 2) underpinned the subsequent development of a list of projects that could be pursued in the future. When framing the task (of developing projects), participants were directed to focus on projects to enhance those connections. They first developed a list of projects which were scored in two iterative exercises (Activities 2 and 3) to achieve a group consensus on their relative importance and/or feasibility (Table 6-3).

Discussions focused mostly on the proposed ranger base and outstation projects – that emerged as the highest and lowest scoring projects. The proposed ranger station was considered the most achievable / likely to occur; outstations were considered expensive and thus less likely to be established, at least within the foreseeable future. Some participants who had initially scored the outstations highly revised their scores based on the insights of other participants (Activity 3).

Statistical tests were used to check the final scores for the projects after the participants had discussed their initial scores and then resubmitted. This confirmed that the difference in scores was statistically significant (Kruskal-Wallis equality of proportions test; significant at 0.05 probability level), suggesting the group discussions facilitated a deliberative social decision. Such decision-making is better aligned with Indigenous community values than simply tallying individual preferences.

Table 6-3. List of projects proposed and prioritised by participants, with both the scores before and after joint discussion.

Final rank	Project description	Score before	Score after
1	Rangerbase and on Country management and monitoring	9.5	9.8
2	Maintenance of rock art	9.0	9.2
3	Walking burns	8.3	8.5
4	Managing visitors e.g. cultural walks	6.5	8.3
5	Chopper burns for carbon farming	7.8	8.0
6	*$20 per week power bill reduction for all Mungguy houses*	*7.0*	*7.2*
7	Mungguy outstations on Country	7.5	6.0

The three most highly ranked projects in both rounds were: walking burns; rock art maintenance; and ranger base and on-Country management and monitoring. For each project, we asked participants to discuss (Activity 4):

- exactly what they thought the activity involved and who should undertake it
- how the activity/project would influence the core components of the model built in Activity 1 (Figure 6-1), namely:
    - cultural places
    - being on Country
    - looking after Country
    - bush tucker
    - spiritual connections.

6.3.1.1 Burning Country

Two different processes of 'burning' Country to trigger regeneration and reduce bushfire risk were identified as potential projects: 'walking burns' (no. 3) and helicopter or 'chopper burns' (no. 5). Although both involve burns, walking burns scored notably higher than chopper burns. This provided an opportunity to discuss the value/benefits of the *processes* of caring for Country – that is, *the 'right people' caring for County the 'right way'* – rather than merely the outcome of an activity.

'Walking burns' or 'cold burns' are low intensity, slow burns of Country for regeneration/risk management. This outcome, however, is not their only objective. During walks participants are also expected to learn about rock art; walking tracks; plants and animals; and men's and women's places. Participants also learn about how to survive in the wild, how to understand threats such as buffalos and snakes, and their own resilience. At its heart, a walking burn fosters observation and sensitivity to the environment, enabling participants to learn and feel the Country. This style of burning Country is critical, as it uses natural barriers to protect flora and fauna and sacred sites. Sometimes, burns need to take place at night time, and windy days should be avoided. Men and women TOs (senior), young TOs, and Parks Australia rangers should be doing walking burns together. Walking burns were strongly linked to the five themes of cultural connection identified by the Mungguy people (Figure 6-3).They contributed to being on Country, looking after Country, cultural places and bush tucker, all of which reinforced the spiritual links of people to Country Figure 6-3a.

By contrast, helicopter burns does not build connections to Country and rather than creating a spiritual connection, they detract from it (Figure 6-3b). Although burning from helicopters takes place relatively frequently, discussions focused on the desiraiblity of it being largely replaced by walking burns. The risks to plant life, animals or secret and rock art sites from chopper burns was stressed (Figure 6-3b). It was considered suitable only when access by foot was not possible or too dangerous. From a spiritual and 'connection to Country' perspective, chopper burns are a very different activity to walking burns.

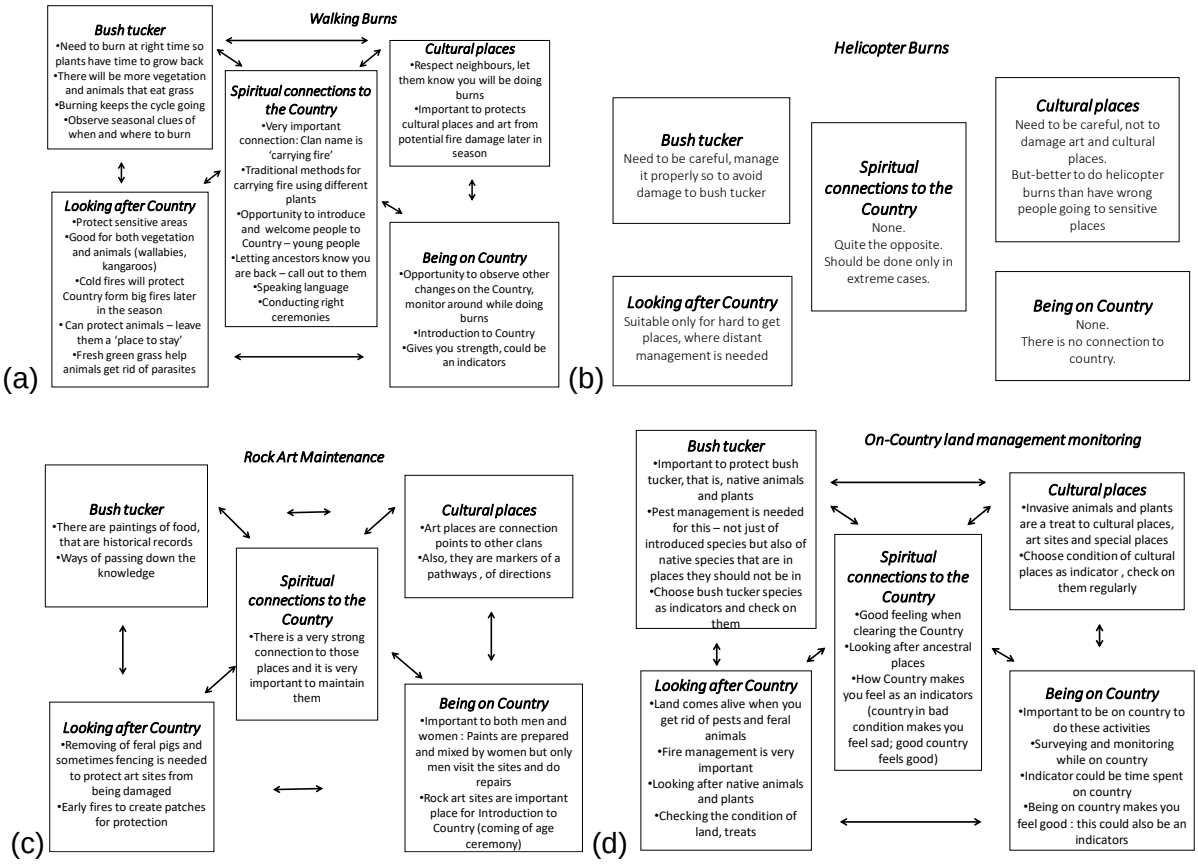


Figure 6-3. Perceived connections of each suggested project with the Country: (a) walking burns, (b) helicopter burns, (c) rock art maintenance and (d) on-Country land management and monitoring.

6.3.1.2 Maintaining rock art

Most of rock-art sites are accessable on foot only. Maintenance activities include removing dead wood to prevent fire creeping and burning around rock art. This is achieved through early/light burns that are performed very carefully, to protect rock art during subsequent fires. The installation of fencing might also be needed onsite to keep out pigs, wallabies and dingoes. Data on the condition of the rock art should be recorded to help prioritise future management actions. The male TOs of the three clans with the right to care for rock art should be doing this work, however suitable Parks staff (young men of a certain age) can come along and visit art sites. TOs do not have to wait for Parks Australia – rock art maintenance should be done when it suits the three clans, informing Parks about their intention to do it. How rock-art maintencance strengthens to connections to Country in shown in Figure 6-3c.

6.3.1.3 Ranger base and on-Country management and monitoring

Discussions of on-Country land management and monitoring first focused on the logistics and skills required of rangers, before considering the actvities rangers could undertake. These included, but were not limited to, managing feral animals, weeds and pests; maintaining rock art; managing fire regimes (both chopper and walk burns); managing visitors and education program; undertaking plant, animal and cultural surveys and monitoring; and activities dictated by the Indigenous seasons, such as tasks that coincide with the blooming of a particular flower.

The final discussion focused on monitoring the effectiveness of on-Country management. Participants proposed some potential indicators of success (Figure 6-3d). As indicators aligned with the Bush tucker, Cultural places and Looking after Country themes, participants suggested: the condition and abundance of selected bush tucker species; the condition of art sites and cultural places; the condition of land; and the status of threats to Country (e.g. invasive species). Such indicators were consistent with the approach of ecosystem services accounting. However, potential indicators aligned with the themes of Being on Country and Spiritual connections to Country were centered around people's wellbeing, not the condition of the ecosystem/land. As being on Country makes people feel good, satisfaction levels recorded in response to questions such as 'How satisfied are you with the opportunities you have to spend time on Country?' may be used as an indicator here. Similarly, for spiritual connections, as Country in good condition makes people feel good, while Country in poor condition makes people sad. Hence, 'How does Country makes you feel?' could be used as an overall indicator of the condition of the land Figure 6-3d).

6.3.2 Can a monetary 'value' be ascribed to the projects or the components of the model they influence?

The conceptual models co-developed with our Mungguy partners suggest complexity, connectivity and community are omnipresent when considering Indigenous cultural values. This means it is inappropriate to use traditional non-market valuation methods (e.g. travel cost, choice modelling, replacement cost) to 'value' individual parts of the system (such as the regulating services attributable to a hectare of shrubland that is in 'good' condition). However, **it is possible to prioritise 'bundles' of relevant and interconnected goods/services** (Grainger & Stoeckl, 2019). While it is not possible to measure and report individual values for such 'bundled' goods/services, insights from collective assessments can be used to learn more about systems (as a whole) and to generate information to support decision-makers.

The theoretical 'money' based project added to the Mungguy people's project list was a $20/week power bill reduction for all Mungguy households. All except one of the Mungguy projects were scored higher than this monetary benefit. As with the Ewamian workshop, this information cannot be used to provide a precise estimate of the 'value' of any of the priority projects. However, we can conclude all but one are 'worth' more than $20 per week to a (Mungguy) household. We could also make other meaningful comparisons using the priority project rankings. For example, while chopper burns can generate potentially significant revenues associated with carbon farming, they have little or no influence on the core elements/themes of the Mungguy mental model, and raised concerns about potential harm (Figure 6-1). By contrast, walking burns were considered to generate positive impacts across the model. In theory, such insights could inform estimates of the monetary 'value' of the parts of the model. In this case, all parts of the model were positively influenced by walking burns. This means **these parts have a minimum 'bundled' worth that is greater than the revenues earned through chopper burns**. We do not have sufficient information to determine how much more, nor would it be appropriate to deconstruct their collective value into constituent parts (e.g. 'valuing' the cultural places relative to bush tucker).

7. Discussion, conclusions and recommendations

7.1 Workshop findings, ecosystem services and the System of Environmental-Economic Accounting – Ecosystem Accounting

Insights from the Ewamian workshop allowed us to build our initial conceptualisation of the nature-people system and ecosystem services which was subsequently confirmed and extended using insights from the Mungguy workshop.

The development of the model is illustrated in Figure 7-1. The first panel, Figure 7-1a, illustrates the relationship between the environment and society, the key focus of the SEEA EA. 'Nature' is measured and accounted for in the SEEA EA by two physical stock accounts (ecosystem extent and ecosystem condition) and one account measured in monetary terms (monetary ecosystem asset). Nature provides a flow of benefits, that is, ecosystems services. These are represented in the SEEA EA accounting measured in both physical (size or extent) and monetary units. The services represent the flow of benefits that contribute to the wellbeing of individuals and society.

The second panel, Figure 7-1b, extends the system model by recognising the values of reciprocity and related reciprocal norms between people and the land they manage and care for (Comberti, Thornton, Wyllie de Echeverria, & Patterson, 2015; Cooper, Brady, Steen, & Bryce, 2016; Delevaux et al., 2018; Díaz, Pascual, Stenseke, Martín-López, Watson, Molnár, Hill, Chan, Baste, Brauman, et al., 2018; Morishige et al., 2018).

The third panel, Figure 7-1c, illustrates the feedback loop identified in this research project and reported on here and elsewhere (Stoeckl et al., 2021), in which the wellbeing benefits flowing to individuals and society from nature can arise directly from the acts of providing stewardship services to nature, rather than flowing only via ecosystems services.

The fourth panel, Figure 7-1d, highlights the interconnectivity within each of the components of the system model. Neither nature nor society comprises entirely separable and separate goods, services and people. Rather, each comprises 'bundles' of many interconnected and inseparable parts that together are worth far more than the sum of the individual parts. This panel highlights the need to take account of synergies and interrelationships when considering the parts of the system, and the complex system as a whole (Stoeckl et al., 2018).

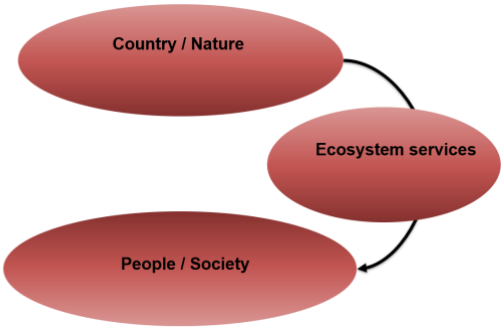
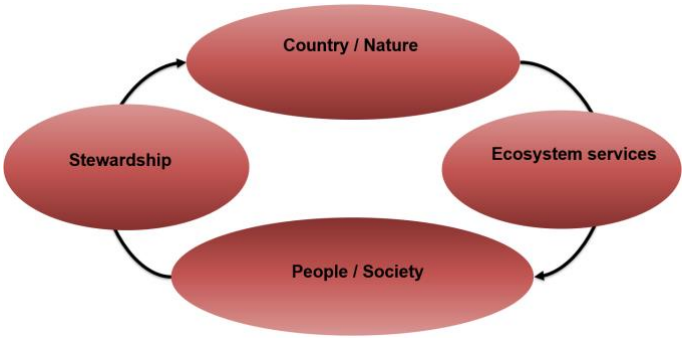
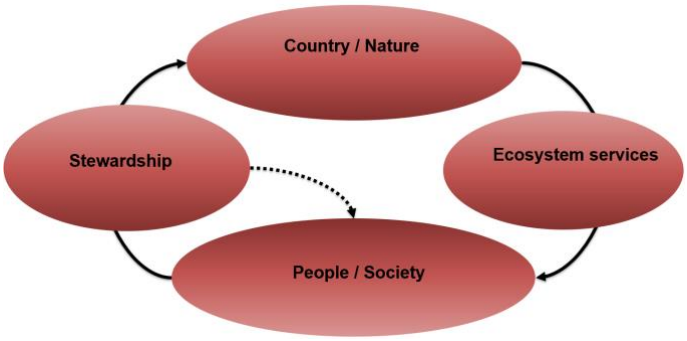
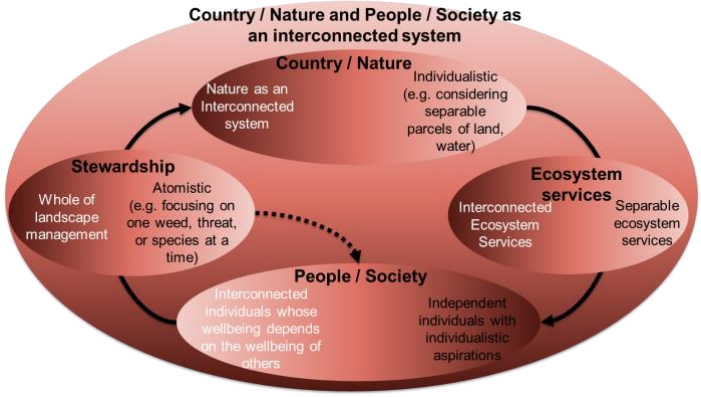
‘Model’	Relevance to SEEA EA
	(a) A simplistic representation of the western-science concept of ecosystem services – effectively showing the way in which nature (Country) benefits people. These are the benefits that are primarily the focus of SEEA EA.
	(b) A slightly more holistic representation, showing that there is an important reciprocal relationship (stewardship) whereby the activities of people benefit nature (or, harm as when activities generate pollution). The full suite of (integrated) SEEA (SEEA CF and SEEA EA together) arguably includes elements of this reciprocal flow, for example, by including additional accounts that consider expenditure on land management/ stewardship activities (environmental protection expenditure account) and by including the impact to the environment, enhancement or degradation, within SEEA EA monetary ecosystem stock accounts, although these two separate accounts and accounting entries are not explicitly linked.
	(c) Workshop discussions highlight that stewardship activities do not only benefit nature (and thus indirectly benefit society by improving the ecosystem condition and thus the flow of ecosystem services), but stewardship activities themselves, have wellbeing impacts for society. This suggests that SEEA (CF & EA) accounts may need to include additional measures that directly consider the wellbeing of people.
	(d) Although western scientists often conceptualise the system as comprising separable and additive components measurable at individual scale, Indigenous perspectives prioritise connectivity and ‘collectives’ – for example, viewing the landscape in its entirety rather than as parcels of land. This suggests that, in some cases (including, but not necessarily limited to Indigenous contexts), the SEEA EA accounts may need to measure/monitor collective ‘bundles’ of goods and services, rather than individual components.

Figure 7-1. Using learnings from the workshop to enhance understandings of the human–nature system and to begin to identify things which may need to be considered within the SEEA EA if wanting to acknowledge Indigenous connections to Country.

7.1.1.1 Modeling indefinite sustainability – real world and accounting limitations/barriers

We hypothesise that the dynamic and reciprocal model shown in panel (d) Figure 7-1 is indefinitely sustainable, provided the stewardship activities undertaken by humans to support nature are sufficient to replenish any drawdown in (natural) capital that occurs when humans benefit from nature (as when they enjoy ecosystem services). The SEEA EA accounts focus on the extent and condition of ecosystems. The importance of doing so is clear because it is evident that if ecosystems are maintained then ecosystem service flows will also be maintained. However, we also note that:

- The existence of ecosystem services does not guarantee people will be able to benefit from them. This is analogous to starvation caused not by a lack of food, but due to the inability of those starving to access it. If people do not have access to the benefits of ecosystem services, then there is no 'value' to record in the SEEA EA. Although this may seem incongruous, economics formally defines 'value' as improvements in wellbeing (individual and social welfare) – and it is economic values which are measured in the SEEA EA. Ecosystem service accounts within the SEEA EA require the economic unit using a service (e.g. farmer, household, government etc.) to be specified. If the ecosystem service (a flow) has no users and, hence no definable/measurable 'value' then neither does the asset (since in the SEEA EA system, asset values are calculated as the present value of the flow of service values).
- The system modelled is not sustainable over the long term if it is not maintained – people must be able to care for Country (and, so, care for themselves). A sustainable system can be described, in Indigenous terms, as one that maintains 'healthy people, healthy Country'. With little or no discounting, the goal of indefinitely preserving (or improving) the system is the same as that of wanting to maximise asset values. This is consistent with the goal of preserving asset values within SEEA EA and Australia's EEA.

This means **it will be important to measure/monitor more than just the extent and condition of ecosystems if the aim is to maintain ecosystem asset values into the future.**

Ecosystem asset values are a function of ecosystem service values, which do not *only* require ecosystems to exist and to be in good condition, but which *also* require humans to be able to benefit from the services (no benefit, no value) and to be able to maintain the condition of the ecosystem into the future.

7.1.1.2 A new model of connections to Country and barriers to reciprocating benefit flows

Figure 7-2 (below) incorporates the core insights above to deliver a final model that is subtly different to that in Figure 7-1d. First, it explicitly recognises structural **barriers that can prevent people (individuals and society more widely) from accessing/benefiting from ecosystem services from nature (blue barrier).** Second, it explicitly recognises the structural **barriers that can prevent people from being able to undertake stewardship activities (green barrier)** which could benefit nature. The presence of either or both structural barriers (noting that the second barrier is driven by many of the same factors as the first) act as breaks or leakages from the system, thus disrupting the sustainable nature-people system that can maintain 'healthy people, healthy Country' over time. These issues were evident in both the Ewamian and Mungguy workshops.

The second workshop with the Mungguy also highlighted an additional and critically important structural barrier. That is when Country is not cared for the 'right way', many of the benefits of caring for Country are not reaped. This was exemplified by the difference between 'chopper burns' and 'walking burns' on Country. Both are, notionally, stewardship activities that that 'look after Country'. However, the benefits of 'chopper burns' (in which a pilot, rarely a TO, flies over head) are limited to carbon credits associated with reductions in future bushfire intensity*:* other associated co-benefits of 'walking burns' that connect to Country are lost. Such **'disembodied stewardship' is represented as an orange barrier**.

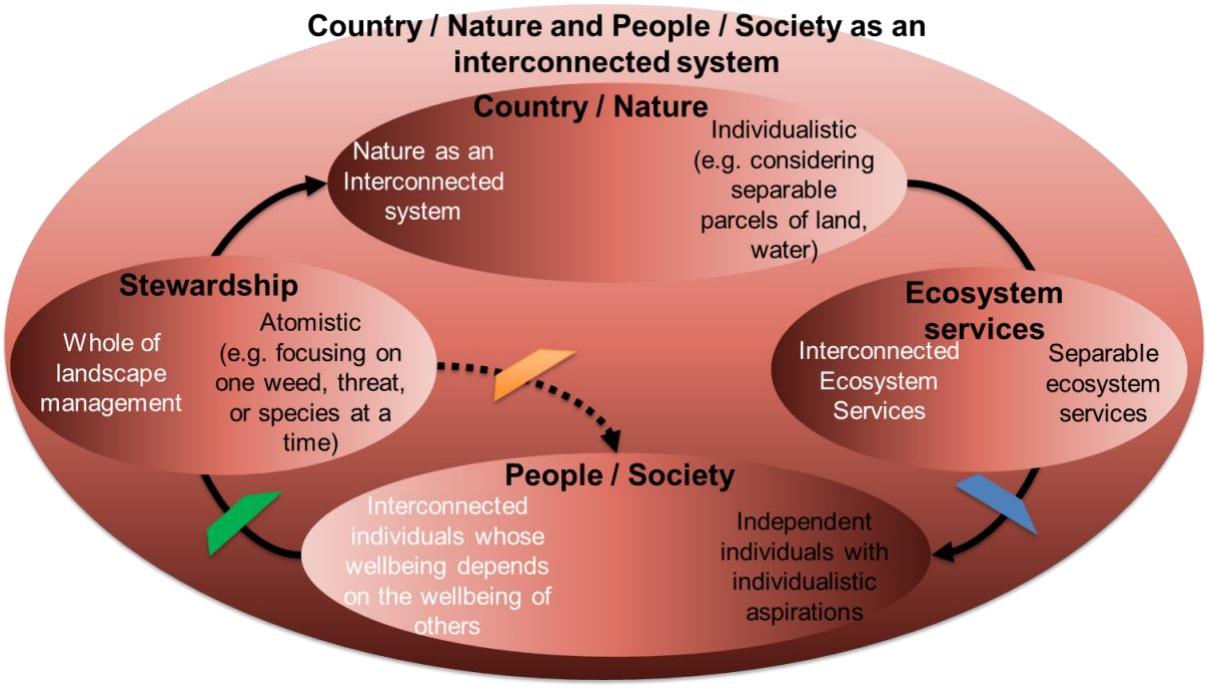


Figure 7-2. Our revised framework which includes structural barriers. First, barriers can prevent people from accessing ecosystem services (blue, right). Separate barriers can prevent people from being able to undertake stewardship activities (green, left) or from benefiting directly from stewardship activities (orange, middle).

7.1.1.3 Recognising and capturing ubiquitous interconnectivity in valuation models

The ubiquitous interconnectivity of the Indigenous nature-people system is well described in both Australian (Stoeckl et al., 2021) and international literature (Chan et al., 2012; Lyver et al., 2017; Matuk et al., 2020; Pascual et al., 2017). Likewise, the literature highlights the presence and importance of relational values, a theme strongly supported by our findings. Yet, these remains largely ignored in valuation approaches (Díaz et al., 2015; Jacobs et al., 2016; Kadykalo et al., 2019; Pascual et al., 2017).

Although representatives of Indigenous groups do discuss the benefits ecosystem services generate for individuals, such benefits were primarily discussed in reference to families, groups and the wider society. This is consistent with research that has found that in many cultures individual values are not dominant. Rather, community values matter most (Gould et al., 2019; Graham, 1999; Grainger & Stoeckl, 2019). Further, as Stoeckl et al. (2018) suggest, different types of goods and services can benefit individuals and communities in different ways. This means current national accounting approaches – and the geographic information system (GIS) mapping they employ – cannot fully represent an Indigenous nature-people system. Rather, as only atomistic, individualistic and separable values can be captured, there is no opportunity for relationships and connections across space and time to be captured and valued.

In addition, in both case studies, participants also discussed historical timelines that stretch from the ancient past; to the recent past to present; and into a desired future. The critical importance of time and the different time scales of relevance to Indigenous peoples, compared to non-Indigenous Australians, have already been reported in literature (Stoeckl et al., 2021), Differential timelines are of relevance when introducing the idea of 'discounting' flows of ecosystem services values. We thus agree with the calls in economic literature that the use of hyperbolic or quasi-hyperbolic (declining) discount rates or similarity relations is preferred (Laibson, 1997; Rubinstein, 2003), and that different types of ecosystem services might warrant different discount rates (Costanza et al. (2021). Indigenous Australian's have the oldest culture on earth, with temporal perspectives that greatly exceed the 300-year limit after which some economists suggests discount rates should fall to zero (Weitzman (2001).

7.1.1.4 When the whole is bigger than the sum of its parts

The SEEA EA is underpinned by spatial analysis – containing details on ecosystem extent and condition, and ecosystem services, across geographic space. However, the concept of separately identifying and valuing different parcels of land is not in accordance with Indigenous worldviews. Traditional Owners/stewards seek to care for all of their Country, and do not value some places over others; instead all of Country is interconnected and inseparable. Although Indigenous groups are willing and able to prepare cultural maps of their Country, highlighting locations of particularly cultural or spiritual significance (such as the Gunbower Yemurriki Map created by the Barapa people and reported by McConachie, Jenny, Reinke, and Arrowsmith (2020), this does not indicate that the rest of the Country is less significant. The connectivity between people and place across space and time, and the quality of these connections and relationships is vital; the value of the whole is much more than the sum of the parts.

We support the urgent call by Hill et al. (2021) for cultural differences to be taken seriously in humanity's efforts to conserve and restore nature. Respectful collaboration between different

knowledge systems and worldviews can also significantly enrich the empirical, methodological and epistemological bases for action to stem the decline of nature and create more sustainable futures (Hill et al., 2021).

7.1.1.5 What role, if any, for monetary values?

In our workshops with the Ewamian and with Mungguy peoples we tested a project prioritisation process[15], using a deliberative social decision-making process (considered to provide results more in line with community values, compared to systems that simply tally individual preferences (Grainger & Stoeckl, 2019)) to prioritise the projects of interest to the participants. A comparison of the scores across the projects provided an indication of the relative importance of the projects.

By then including a project with a clear monetary value (in addition to the projects developed by participants) we were able to determine that those projects prioritised over the monetary project had a value greater than that $ value to their community. While we had insufficient information to use our method to provide a precise estimate of the value of the benefits provided by each individual project, this preference approach warrants further exploration. This approach could facilitate the estimation of **the value of 'bundles' of related and interconnected benefits**, increasing our understanding of the reciprocating nature-human model for a particular Country, thereby proving useful new insights and information for decision-makers.

7.1.1.6 Beyond 'ecosystem capacity' – understanding who has the 'capacity' to access benefits

'Ecosystem capacity' is recognised as important within the SEEA EA – but is not explicitly accounted for. It is defined in the SEEA EA as 'the ability of an ecosystem to generate an ecosystem service under current ecosystem conditions, 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' (UNCEEA, 2021, p. 146). That is, ecosystem capacity is concerned with whether the ecosystem is being used in a sustainable manner. This concept is also relevant to Indigenous reciprocating models. The SEEA EA recommends modelling should be undertaken to assess the potential capacity of an ecosystem to provide ecosystems services, and that such assessments and associated discussions can directly support the interpretation and application of the information provided within ecosystem services accounts.

We agree with this recommendation but go further: we recommend that the 'capacity' of society to access and/or benefit from ecosystem services and to provide stewardship services should also be assessed and modelled, as part of process of preparing Australia's new EEA EA accounts. The relationship between the capacity of ecosystems to provide ecosystem services and ecosystem accounting is shown in Figure 7-3. This has been adapted from the UNCEEA (2021, p. 145 Figure 6.1) to include society as an important component of the linked socioecological system.

[15] The prioritisation process involved participants developed a list of potential projects, which were then scored across two rounds with discussion between each round of scoring.

While understanding of the capacity of the ecosystem is important in informing policy and management decisions that help people to benefit from ecosystem services, the insights from our workshops (discussed above) demonstrate that **understanding the capacity of people to access these benefits is also vital and should be fully reflected within the accounts**.

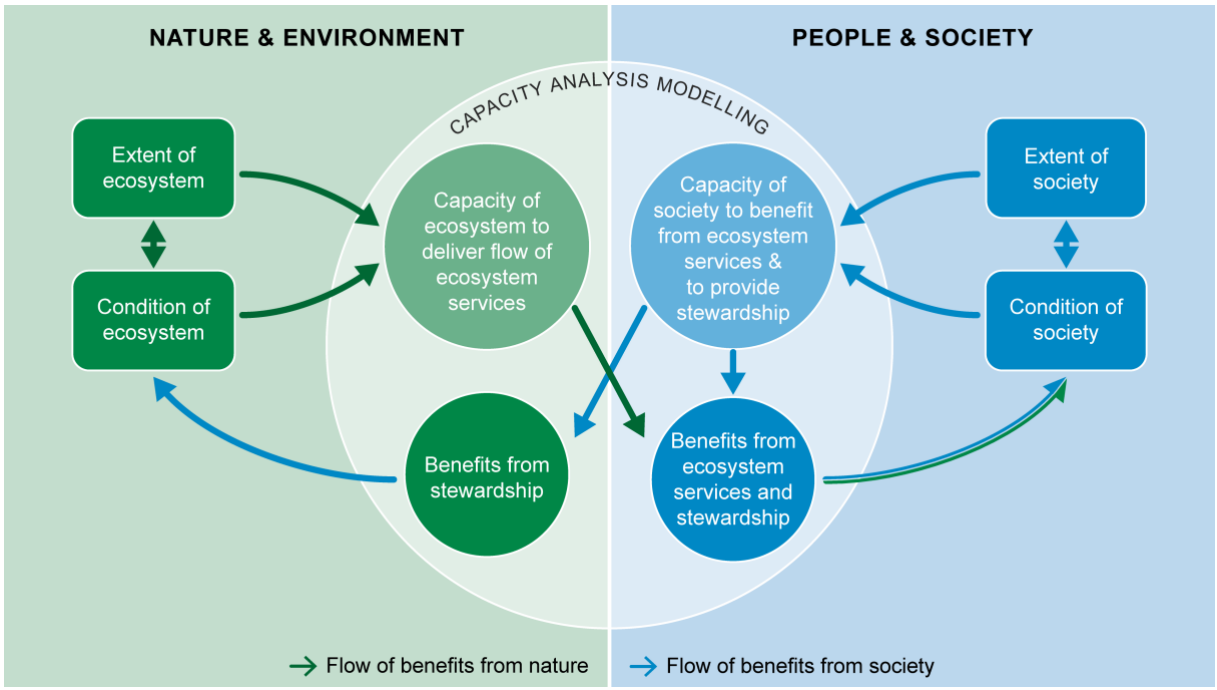


Figure 7-3. Relationship between capacity, ecosystem accounting and society. Flows depicted by green arrows represent the flow of benefits recognised within SEEA EA, adapted from SEEA Committee of Experts on Environmental-Economic Accounting (2021) System of Environmental-Economic Accounting – Ecosystem Accounting: Final Draft, Figure 6.1, page 145 (UNCEEA, 2021) (which was itself based upon Maes et al. (2018)). We add society to the relationship, with blue arrows depicting flows of benefits from society. Further, we add the need for capacity analysis modelling to include capacity of ecosystems to deliver ecosystem services (as recommended by SEEA EA) but also to include modelling of the capacity of society to benefit from ecosystem services and to provide stewardship services.

7.1.1.7 Towards an interconnected society–nature accounting system

Recognising an interconnected nature–people system – and the barriers that can prevent or impede the flows of benefits through that system to society or to nature – extends the scope of the policy questions that can be explored within this framework (Figure 7-3). It is important to recognise the framing and scale of questions may differ when adopting an Indigenous peoples' perspective, as opposed to a national perspective. Indigenous TOs have stewardship responsibilities over their own lands, so they are concerned with maintaining the health of *their* Country and *their* people; goals that are inextricably linked. A national government has responsibility for the entire country and all the people within it. This implies the prioritisation of different values, with consequential impacts on the key problems identified, and the appropriate solutions, including the policy levers used.

Simplistically, we recommend that those developing and intending to use ecosystem accounts (assumed here to be policy-makers) should first focus on the questions and decisions most relevant to them, then seek to account for those. Just as the hammer may not be the appropriate tool to fix every situation, the accounting systems and indicators used to inform policy-makers may not identically reflect the accounting systems and indicators

needed to inform others. The system thus needs to be flexible and tailored to address the particular needs of different people – in this case, TOs. The extent and condition of the environment is important, but so too is the 'condition' of people and society; similarly, the benefit flows from people to nature, and the flows to people from caring for nature, are also important, in addition to the flows of benefits (ecosystem services) from nature to people. Thus, by including these elements, and seeking to operationalise the links between different peoples' priorities and project choices, the information from such accounts and indicators/measures can better support decision-making.

The adoption of an Indigenous perspective aligns with the SEEA EA standard, which recognises that multiple perspectives are available, and that different value perspectives will provide different values. The SEEA EA mainly focuses on spatially separable values of anthropocentric origin. The insights from our transdisciplinary work with our Indigenous partners clearly illustrates the potential benefits that could arise from recognising these wider/alternate value perspectives within, or alongside, the SEEA EA accounts (including the development of supplementary satellite EA accounts). Furthermore, in addition to including the information formally within accounting tables, this information could be represented in innovative ways, such as by use of video footage of Indigenous people on Country illustrating their cultural connections, values and benefits to and from Country. Such representations would increase the accessibility of the information developed by the accounting process to Indigenous people, and could encourage the take up and use of the accounting information by Indigenous peoples.

During our research we were informed of progress made by DAWE and partners on the parallel project testing ecosystem services accounts preparation following SEEA EA principles for the GKP Forest Icon site. The authors of this work have identified that one limitation was that Indigenous Australians' knowledge and perspectives were not included within the conceptual models upon which the GKP ecosystem accounts were based, and identified an opportunity for future improvement by working with Indigenous Australians to identify how, or if, Indigenous ecological knowledge could be woven in, or developed in parallel to, conceptual models.

We believe our work has made a solid first step towards this, having worked with two Indigenous groups to develop their conceptual models of their cultural connections to their Country, and considered how these relate to more traditional western science conceptualisations. While there were some key similarities between the models developed by each Indigenous group, there were also some key differences. This highlights the importance of testing the approach more widely with other Indigenous peoples, and recognising that different recommendations may arise from working in different locations with different people. Consequently, a context specific approach should be adopted when seeking to develop EEA EA accounts for different locations.

7.2 Additional (broad classes) of indicators that could be considered in the System of Environmental-Economic Accounting – Ecosystem Accounting

The ineffectiveness and discrimination of single-value approaches has been discussed in the literature for several years now (Jacobs et al., 2016), with recommendations for plural valuation cultures (Tengö et al., 2017). Inclusive conceptualisations incorporating different

worldviews, frameworks, timelines and languages would be required to make accounting frameworks suitable for use at various scales and for a range of audiences (Hill et al., 2021). To capture the full extent of the nature-people system:

- Not all indicators can be biophysical in nature (condition of the land, i.e. condition of the creek; number of species; hectares of mangroves). Some indicators must monitor 'stocks and flows' of people and the spiritual connection to their lands/Country.
- The key question of 'what are people managing (nature) for?' has to be answered before the 'right' outcomes can be defined and suitable indicators assigned. And, as this question is scale and audience dependent, the 'right' outcomes and suitable indicators may be context-specific. This means hybrid models are needed, in which some indicators/variables might be suitable for all, while others may be context-specific.

Figure 7-2 allows us to identify additional (broad classes) of indicators that could be considered when seeking to capture Indigenous connections to Country within, or alongside, EEA EA related monitoring activities. These are set out in Table 7-1. We have deliberately described indicators in general terms – using the core components of Figure 7-2 as column headers to ensure that all core elements of the model are considered.

With this format as a foundation, we have added several key elements. a) the importance of the condition/capacity of society to enjoy the benefits provided by ecosystem services, b) the further benefits that can flow to nature and back to society by enabling/supporting the 'right' people to care for Country in the 'right' way. This highlights the importance of the 'flows' (the relationships) between the 'stocks' of nature and society, and, hence the need for appropriate indicators to monitor the quality of those flows. (We have not identified indicators relevant to ecosystem extent and conditions, as these are well covered elsewhere).

We have not sought to prescribe a specific suite of indicators. Just as we need the 'right' people to look after Country the 'right' way, the 'right' people should also determine what should be monitored and measured. While we have provided a generalised model and transferrable approach and method. However, the development of specific indicators should be Indigenous-led and context specific, empowering the TOs of the land and society that we seek to account for. We emphasise the critical importance of working with Indigenous communities to test, refine, and appropriately contextualise indicators: one size will not fit all. However there are existing examples of Indigenous-led and developed environmental monitoring, such as the Bininj/Mungguy Healthy Country Indicators[16], a model that could be adopted to developing appropriate SEEA EA indicators.

[16] For further information on this work see https://www.nesplandscapes.edu.au/projects/nesp/healthy-country-indicators

Table 7-1. Enabling factors (to generate ecosystem-services values) and additional (broad classes of) indicators that could be included in Environmental-Economic Accounting – Ecosystem Accounts to better capture core factors relevant to Indigenous connections to Country.

	Ecosystem asset (stock) SEEA EA	**Ecosystem Service (flow) SEEA EA**	**Society (stock)**	**Natures benefits from people (flow) (SEEA)**	**People benefit from looking after Country (flow)**
Enabling factors (must be present for people to be able to (a) benefit from ecosystem services [no benefit, no 'value' – of either flow or asset] and (b) maintain condition of Country [thus ensuring long term sustainability]).	*Ecosystem must be present and in good condition (extent and condition).*	*TOs must have access to Country.*	*TOs must be healthy enough to get out on Country and appreciate services.*	*The Country must be looked after the right way.*	*The 'right' people (TOs) need to look after Country.*
Potential indicators to measure/monitor Some can be general, some context-specific.	Numerous examples through the literature (including condition of sacred sites) – not repeated here.	Number of people who are able to go out on Country – the places they are able to access and the length to time they are able to stay. Could also keep track of age, gender (etc) of visitors and of activities undertaken while there. Could also aim to monitor perceived benefits (flow) from native title, Indigenous Protected Areas (IPAs), Indigenous Land Use Agreements (ILUAs), etc.	Could monitor overall (subjective) wellbeing of people; in addition to monitoring objective indicators of wellbeing (that may include things such as income, housing, education, physical health, etc – these should be selected by community) Land tenure relating to native title (IPAs, ILUAs etc).	Extent to which TOs are satisfied that their Country is being looked after the 'right way'. Extent to which Traditional knowledge and practices are used when caring for Country &/or satisfaction of TOs that the correct practices are being used. Extent to which TOs manage and make decisions.	Number of TOs who can go out and care for Country (relative to number of non-TOs caring for Country).

7.3 Conclusions

At the outset of this project, we problematised the potential of any system (especially one based on western values) to capture Indigenous cultural connections to land. While not perfect, such an endeavour is necessary as systems of accounts are a pervasive feature of western life (Burchell, Clubb, Hopwood, Hughes, & Nahapiet, 1980), so a compromise between Indigenous and western values is necessary (Gallhofer et al., 2000). The development of such a system must include Indigenous peoples at every stage, because it is their cultural connection to land that we seek to capture. In this project, we have strived towards this goal and through deep, respectful and meaningful engagement with TOs. We have collaborated to identify indicators/measures that are relevant for their decision-making purposes as stewards of their Country. Through a review of the literature and discussions with TOs and board members, we identified the key aspects of traditional accounting/economic valuation that conflict with Indigenous worldviews. These included placing a monetary value on the environment, ignoring the non-use values of ecosystems, accounting for ecosystems without the people and valuing land for the purposes of comparisons between various parcels of land. Aware of these conflicts with western economic valuation/accounting, we worked with TOs to identify how they perceive their cultural connections to Country and used western science knowledge to determine how to best integrate this within the SEEA framework.

We found that the one-way flow of ecosystems benefits to people and the various ecosystems service categories and monetary values that underpin emerging ecosystem accounting frameworks **were fundamentally incompatible with Indigenous values**, concepts and relationships with Country. This means, the **'value' of Indigenous land management cannot simply be captured by integrating Indigenous practices into Australia's overarching EEA EA.**

However, we worked with **our Indigenous partners to develop an alternative, parallel 'valuation' model and a generic process and set of indicators** to enable connections to Country to be accounted for. This will enable future Indigenous-led partnerships to develop specific, context specific indicators for Australia's diverse Indigenous communities.

7.3.1 Key findings and recommendations

The diversity of cultural accounts means that the accounts themselves are not as important as the process by which these accounts are prepared. Instead of using a fixed set of metrics as the starting point and then collecting those metrics, the process must begin by working with people to identify what should be counted/prioritised, how it should be counted and how it should be presented.

Our two case studies highlighted the distinct histories, cultures, experiences, economic activities and the varying capacities of Indigenous people to access and care for their land. This diversity of connections to Country, means a commensurate diversity in local priorities and indicators/measures. While this may impede comparability, it is important to note the goal of Indigenous groups is not to compare their Country to another group's Country, but to monitor and understand the 'health' of their own Country and people (*healthy people, healthy Country*). Likewise, for governments at every level, the inclusion, for the first time, of cultural connections to Country will not enable comparisons between Countries. However, such new

insights can inform discussions and decision-making and provide additional data to be considered with monetary/economic values. Our key recommendations are:

7.3.1.1 Additional 'people-focused' indicators are needed for ecosystem accounting to capture Indigenous connections to Country

As the Australian Government embraces EEA EA accounting, it is clearly important to monitor the extent and condition of ecosystems, the capacity of ecosystems to deliver services and the flow of benefits from those ecosystems to people (a core task for S/EEA EA accounting). However, our research and the resulting new model (Figure 7-2 and Figure 7-3) highlights the importance of monitoring/measuring equivalent stocks and flows associated with the *people* who are an integral part of this connected system.

This modified view of the core contributors to EEA accounts suggests **generic groups of additional indicators (**Table 7-1**) could be used alongside (but not integrated into) existing accounts to better capture key relationships/variables/issues that support Indigenous connections to Country**. These include, but are not limited to, indicators of: TOs' access to Country; the socioeconomic condition, health and wellbeing of TOs; and whether Country is being looked after the 'right way' by the 'right' people (this should also consider governance and management). And, just as the 'right' people have to look after Country the 'right' way, it is also important that the 'right' people determine what should be monitored and measured; accordingly, such decisions are likely to be context specific. We have not sought to prescribe a specific suite of indicators, as this would directly contradict this key finding.

7.3.1.2 The development of specific indicators for 'valuing' connections to Country must be Indigenous-led

Accounting for cultural connections is an iterative process and future projects could develop specific measures, based on our generic ideas, and evaluate their relevance for TOs and government. This would further refine a systematic process for engaging with Indigenous Australians to account for their cultural connections to their land/Country.

Given the incompatibility of the one-way western concept of the provision of ecosystem services to society and the circular Indigenous model of connections to Country – and the diversity of Indigenous communities – the development of specific indicators must be Indigenous led and context specific. The collection of specific indicators that reflect the distinct culture, history, practices and circumstances of each Indigenous group should be led and/or directed by TOs, following appropriate knowledge-sharing protocols. The additional data could be used by TOs to support decision-making as well as more broadly. For example, it may inform or enrich the Australian government's emerging ecosystem accounting system or the development of guidelines around EA worldwide.

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