Experimental ecosystem accounts for the Gunbower-Koondrook-Perricoota Forest Icon Site

Summary from the Land and Ecosystem Accounts Project

Background

In April 2018, Commonwealth, state and territory environment ministers agreed to a Strategy for a common national approach to environmental-economic accounting.

The Strategy committed Governments to apply the United Nations framework, the System of Environmental-Economic Accounting (SEEA).

The Commonwealth's Environmental-Economic Accounts Board chose the Gunbower-Koondrook-Perricoota Forest Icon Site (GKP) as a case study for developing ecosystem accounts for the policy priority of water management, supported by the Murray-Darling Basin Authority (MDBA).

Ecosystem accounts present environmental, social, cultural and economic information about ecosystems. These dynamic communities of plants, animals and microorganisms and their physical environment provide a range of ecosystem services that our wellbeing and economy depend upon.

The Gunbower-Koondrook-Perricoota Forest Icon Site

GKP is located on the River Murray north-west of Echuca and covers an area of 56,020 hectares across the Victorian and NSW sides of the river (Figure 1). In Victoria, Gunbower Forest is part national park and part state forest (managed by the Victorian Government). In NSW, Koondrook-Perricoota Forest is made up of several state forests managed by Forestry Corporation of NSW.

The entire icon site is a Ramsar-listed wetland, contains the second largest extent of river red gum forests in Australia, and is a nesting site for internationally protected migratory waterbirds.

GKP is also one of six icon sites that are regularly monitored for ecological health under The Living Murray program. GKP provides recreational, tourist and cultural activities, as well as timber, pollination and honey, carbon sequestration, and water supply and water quality services to the regional economy.

The GKP case study

This case study's aims were to:

- improve approaches to develop ecosystem accounts
- increase capacity to develop high-quality ecosystem accounts across multiple government agencies in Australia
- demonstrate the value of ecosystem accounting to leaders
- increase uptake of ecosystem service assessment and valuation by Government.

Figure 1 The Gunbower-Koondrook-Perricoota Forest Icon Site

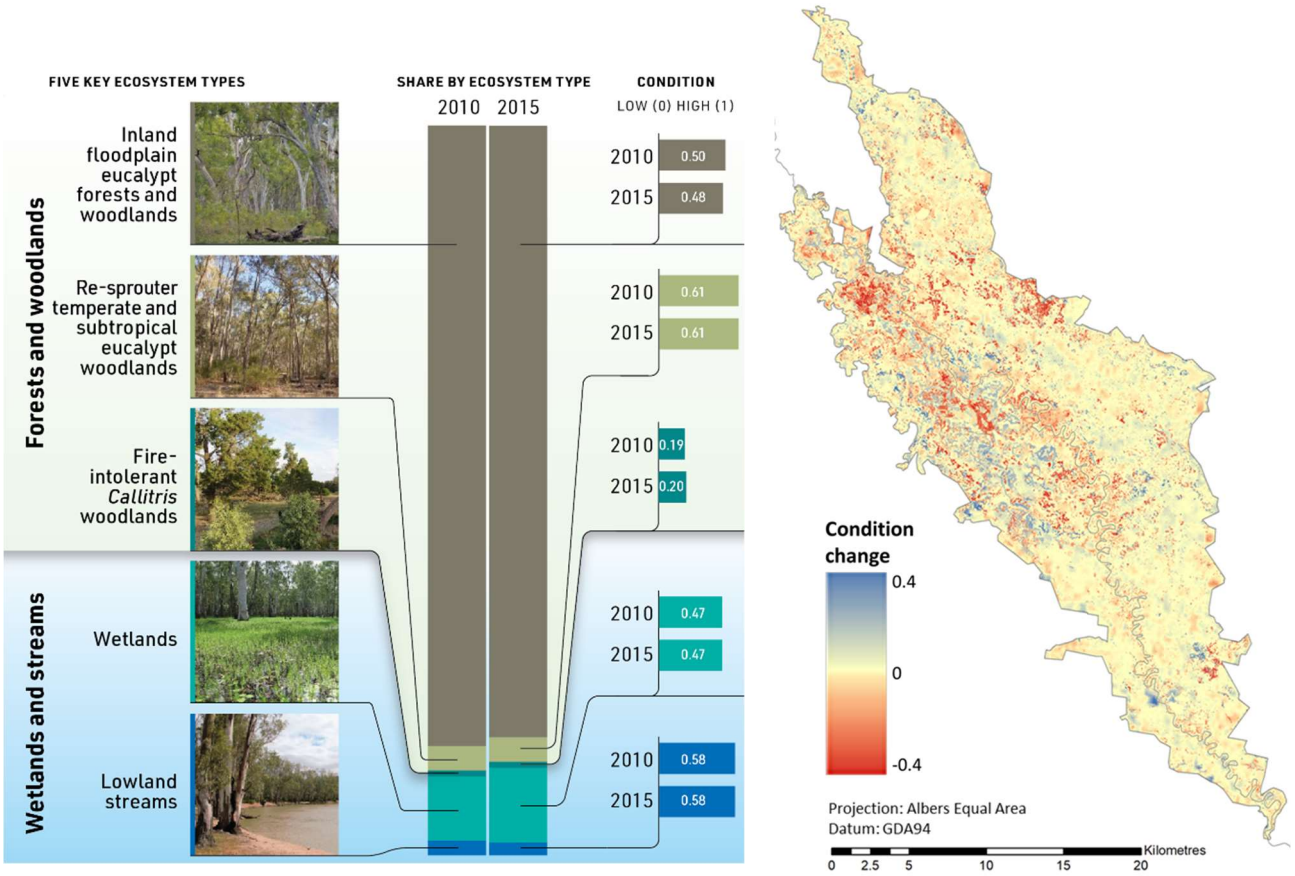

Figure 2 Extent and change in condition of 5 ecosystem types in GKP in 2010 and 2015. Extent is shown as share of the total GKP area of 56,020 ha. Condition is measured on a scale from 0.0 (ecosystem completely removed) to 1.0 (highest level of ecological integrity for that ecosystem type). In the map, blue colours indicate an improvement in condition and red values a decline. Actual condition change exceeded the +/- 0.4 range in a small number of cells.

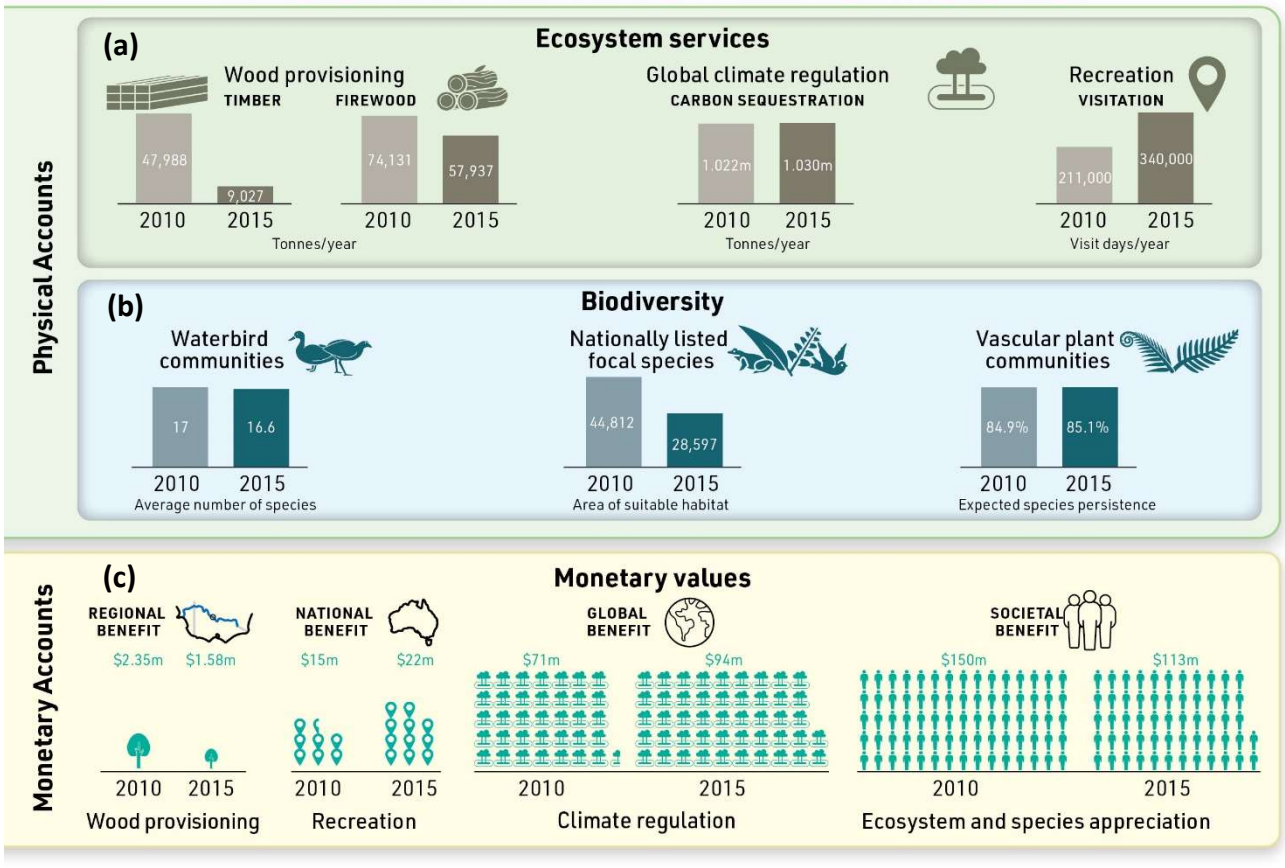

Figure 3 – Quantitative accounts (annual figures) (a) Ecosystem services provided by GKP ecosystems. This is a small subset of the services that the GKP ecosystem provides. Ecosystem services for First Nations Australians and water flow regulation were assessed qualitatively (see McLeod et al. (2021)). (b) Assessed biodiversity in GKP. (c) Monetary values of selected ecosystem services provided by GKP ecosystems. Note that these are annual 'flow' values, covering both use (wood provisioning, recreation and carbon) and non-use values (ecosystem and species appreciation).

Experimental ecosystem accounts

The GKP experimental ecosystem accounts show, in a systematic and simplified way, changes in:

- the extent and condition of GKP ecosystems (Figure 2)
- the ecosystem services provided by GKP ecosystems (Figure 3a)
- biodiversity (Figure 3b)
- the monetary value of some ecosystem services (Figure 3c).

This project was a proof of concept using limited time series, and demonstrates how to connect biophysical and economic information in an ecologically meaningful way.

How can the ecosystem accounts be used?

Management of the GKP and other important sites in the Basin largely focuses on environmental objectives and outcomes. Ecosystem accounts for GKP can help provide credible and trusted information that can be used to understand how a healthy environment provides benefits to people (for example, by providing timber, honey or recreation).

The accounts can help address three policy challenges identified during user consultation in 2019:

- a better way of quantifying the balance between social, economic and environmental outcomes
- better understanding of how environmental management helps people who visit GKP or benefit from ecosystem services provided by the GKP
- better information for ensuring the health of GKP ecosystems for the future.

Technical methods and expertise

For this project, scientists, economists and accounting experts have built on decades of international work to further develop accounting methods that tailor, extend, and more strongly couple existing recognised techniques including:

- the Australian Ecosystem Models Framework, a nationally comprehensive set of conceptual models of ecosystems, which was used to distinguish between changes in GKP ecosystems that are due to natural variability versus human actions
- the Habitat Condition Assessment System, which provides Australia with its first consistent, repeatable, and cost-efficient assessment of habitat condition for biodiversity
- the BILBI biodiversity assessment system, which uses best-available biological and environmental data, modelling and high-performance computing to assess biodiversity change at fine spatial resolution across the global land surface
- methods for assessing the physical flow and monetary value of provisioning services, regulating and maintenance services and cultural services, including the supply of native timber, firewood and honey; global climate regulation (via carbon sequestration and retention); water regulation, pollination, spiritual, artistic and symbolic services (via cultural heritage connection); and recreation-related services.

The methods align with the SEEA Ecosystem Accounting framework, and are designed for scaling to regional and national ecosystem accounts.

Find out more

This document summarises the following report:

McLeod R, Eigenraam M, Schmidt RK, May D, Cheesman J, Dawson L, Richards AE, Ferrier S, Goff S, Harwood TD, Mokany K, Obst C and Prober SM (2021) *Experimental ecosystem accounts for the Gunbower-Koondrook-Perricoota Forest Icon Site*. A report from the Land and Ecosystem Accounts Project. Department of Agriculture, Water and the Environment, Australia.

See eea.environment.gov.au/gkp for this report and other products, including companion technical reports with the detailed methods and data sources. Account-ready datasets are published for conceptual models, ecosystem extent, ecosystem condition and biodiversity.

Find out more about environmental-economic accounting for waste, land, ecosystems and oceans at eea.environment.gov.au/.

Citation: McLeod R, Eigenraam M, Schmidt RK, May D, Cheesman J, Dawson L, Richards AE, Ferrier S, Goff S, Harwood TD, Mokany K, Obst C and Prober SM (2021) Experimental ecosystem accounts for the Gunbower-Koondrook-Perricoota Forest Icon Site: public summary. A report from the Land and Ecosystem Accounts Project. Department of Agriculture, Water and the Environment, Australia. CC BY 4.0.

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