

Frequently Asked Questions for GKP - 10 September 2021

This resource has been put together by the project team to help support understanding and interpretation of the accounts for GKP.

RATIONALE AND SCOPE

Q: Why is the data used in the report from 2010 and 2015?

A: One of the key innovations for the ecosystem accounts was to use a new land cover dataset that has been developed by Geoscience Australia. This dataset was developed specifically for the Experimental National Land Accounts and was limited to the 2010 and 2015 years as the data for land use is linked to the ABS farm survey, which occurs every 5 years. GA will shortly be releasing a more detailed time series on land cover.

Q: Why was this site chosen?

A: The site was one of 14 sites that were nominated by Commonwealth, state and territory government agencies for consideration in the project. The 14 nominees were assessed by the Land and Ecosystem Accounts Project (LEAP) team against a set of criteria: a) policy relevance b) ecological complexity and c) mix of ecosystem services. The Interjurisdictional Steering Committee for Environmental-Economic Accounting agreed to develop pilot ecosystem accounts for 2 sites that best meet this criteria: the GKP site and Kakadu National Park.

Q: Why couldn't we quantify household timber collection?

A: There are many ecosystem services that were relevant to the site, and the choice was made by the team to focus in detail on a smaller number of services, rather than less detail on a larger number of services. Services were selected by the LEAP Team based on an initial review of the full set, considering the interest from consultations, relevant methods and an initial sense of data availability.

Q: Have we engaged with First Nations Australians?

A: Engagement has been challenging over the period of the study's development due to COVID, but we're keen to complement the western-style UN SEEA work with a desktop chapter on First Nations Australians' perspectives that 'opens the door' for substantive engagement in this area.

BIOPHYSICAL

Q: How can we interpret the 0 to 1 condition score?

A: Condition is the quality of an ecosystem. It is measured in terms of its abiotic and biotic characteristics and is expressed as the degree of similarity of a given ecosystem state to its reference state. An ecosystem condition score of 1 means the ecosystem is in reference state - it can maintain its characteristic composition, structure, function and self-organisation over time within a natural range of variability. This reference state sets a benchmark for ecological integrity.

A condition score below 1 indicates degradation or loss of ecological integrity relative to the reference state. A score of 0 indicates a state that is completely departed from reference and has no biological elements remaining from its original reference state.

The 0 to 1 scaling of ecosystem condition means that it can be used to report 'effective habitat area' given the extent of an ecosystem or other land unit of interest. An area with a higher condition score has a larger 'effective habitat area' when compared to an area with the same extent but lower condition score.

Q: Why are the condition results different from The Living Murray assessment of GKP for the two time periods?

A: The TLM rating for Koondrook-Perricoota Forest was 'D' for 2010/11 and 'D' for 2015/16. For Gunbower Forest the rating was 'B' for 2010/11 and 'B' for 2015/16. This contrasts with the ecosystem condition index for GKP, which declined slightly between 2010 and 2015 and was marginally higher for Gunbower Forest compared to Koondrook-Perricoota Forest. These differences are due to the use of different benchmarks and spatial sampling from which the departure in condition is assessed for each method. For the ecosystem condition index, the reference state of the ecosystem is used as the benchmark and condition is assessed using spatially continuous, remotely sensed data. For the TLM rating, condition is assessed against the benchmark of icon site objectives from on-ground data collected at point locations across the icon site. One other difference is that the TLM results are shown in financial years whereas the GKP accounts are presented in calendar years.

Q: Why is there such a dramatic reduction in suitable habitat compared to the condition results?

A: The difference in suitable habitat for the 10 species is likely to be driven by relative moisture availability, given 2015 was a much drier year than 2010 (249 mm of rainfall in 2015 vs 642 mm in 2010). This may have influenced the land cover classes that overlap with 'suitable habitat' for each species considered - in other words, the changes in land cover attributes such as reduced tree cover may have been interpreted as a change in the land cover class (Accounts report, section 8.4).

The suitable habitat for focal species is a customised, discrete measure: either 'suitable' or 'not suitable'. This means that relatively small changes in these land cover attributes (e.g. reduced tree cover) can result in large areas changing in terms of their suitability for occupation by the focal species, based on the land cover attributes that are used to define habitat suitability for species.

In contrast, the condition index is a measure of the quality of habitat for biodiversity overall (based on ecological integrity). It assumes that changes seen when recovering from short-term perturbations do not necessarily mean a decline in condition. It is a more sophisticated measure that takes into consideration natural variability of ecosystems.

Q: Why is this work 'experimental'?

A: This work was a test of applying an international standard for ecosystem accounting to Australia's unique ecosystems. The Australian government wanted to ensure that accounts could both comply with the standard and also be faithful to robust 'cutting edge' Australian ecosystem science. Therefore the project tested whether DAWE and CSIRO's innovative 'AusEcoModels' framework could be used to underpin accounts. Now that the team has proven this is possible and beneficial, and the international standard is finalised, we can create accounts that do not have the 'experimental' tag.

Q: Can we say that the condition of the site improved between 2010 and 2015?

A: Despite natural flooding of the icon site in 2010, 2011 and 2012 and environmental watering of the icon site in 2014 and 2015, no improvement in the ecosystem condition was recorded across the

whole icon site, though changes were seen in localised areas. This is because ecosystems are slow to change in response to incremental perturbations and measurements of condition will reflect a combination of recent and historical events. In the case of GKP there was no floodplain inundation between 2000 and 2010 during the millennium drought. These dry conditions would be reflected in the condition index measured in 2010 and 2015. Future accounts are likely to detect the impacts of the 2014 and 2015 environmental watering, particularly when analysed in combination with auxiliary information from extensive monitoring data and the substantial ongoing research on icon sites (e.g. through the Flow-MER project and the WERP Program).

Q: Can these ecosystem accounts be used to understand change?

Accounts describe historical change, and natural resource managers will need to distinguish between changes in the system that are natural (e.g. driven by water cycles) and those that are due to recent human actions. The ‘ecologically meaningful’ approach to ecosystem classification and condition assessment applied by CSIRO is an ideal tool for interpretation of this change.

Q: Can we say that the change in the site condition was because of environmental watering?

A: We can’t say that changes in condition of the icon site were due to environmental watering because the main environmental watering events occurred at the end of the accounting period in 2014 and 2015. A positive shift in ecosystem condition requires long-term, persistent change in ecological drivers, and is more likely to be observed as a collective response of multiple species after sustained environmental watering over a number of years. In addition, between 2010 and 2015 there was a reduction in timber harvesting at the icon site. This will also impact the future condition of the icon site. While the state and transition models assist in disentangling the effects of environmental watering, compared to altered harvesting regimes, additional analysis is required using more precise monitoring data and other auxiliary information.

SERVICES AND BENEFITS

Q: What is driving the large change in the size of benefits between the two years?

A: The greatest increase in service value is for carbon sequestration – from \$71M to \$94M. This change is not substantively driven by the difference in physical flows, but in the difference in the price of carbon for the two periods.

Q: Recreation: 340,000 visitor days for 2015 seems high. Did we do a sense-check of visitation numbers?

A: - Respondents from greater Sydney reported large visitor numbers in the survey, but tourism operators and council say more people come from Melbourne than Sydney, so the survey is wrong. To accommodate this, we reduced the Sydney survey numbers to match Melbourne.

Note that this is total visit-days (i.e. each visit may take a single day, or multiple days), not visits; average visitor days per visit are around 1.35 visitor days for Gunbower NP and around 1.2 visitor days for KP.

Finally, when survey respondents are asked to recall events long in the past (as in the case of this survey), ‘recall error’ is common. Therefore the confidence in these results are low. Future implementations of this method could improve things by X, Y, Z.

Q: Will the results for carbon be consistent with a standard FullCAM run?

A: No, the GKP method makes use of the finer scale ecosystem data available through the CSIRO work:

- Fullcam doesn't assess carbon sequestration or storage in wetlands, so sequestration rates from literature (Carnell et al 2018) were matched against the GKP wetland states and expressions to estimate sequestration and storage.
- For other ecosystem types, ecosystem attributes in FullCAM were modified based on vegetation characteristics measured in TLM monitoring plots (which had been classified into different ecosystem expressions), including initial stem density, maximum above-ground biomass, maximum and average tree age, standing dead biomass.
- This offers a more accurate estimate of carbon sequestration when compared to a standard FullCAM run as it considers a more comprehensive range of local vegetation characteristics and current default values for FullCAM underestimate maximum above ground biomass. It also means the ecosystem accounts were coherent across the accounts for extent and ecosystem services.

Q: Why are there different dollar values placed on carbon?

A: The exchange value is based on the 'price' of 1 tonne of carbon in the market, whereas the welfare value is based on the 'social cost of carbon' – i.e. the damage to the economy of 1 tonne of carbon.

- The welfare value approach focuses on valuing the economic and social damages arising from changes in weather patterns and associated natural disasters that can be associated with carbon emissions. In contrast to the carbon price (exchange value), this non-market valuation method represents the marginal social cost of producing carbon emissions or the marginal social benefit (avoided costs) of sequestering carbon. The social cost of carbon based welfare value approach is covered in detail in the technical report.

Q: Why didn't the team use the Australian Carbon Credit Units as the exchange value?

A: The World Bank Global median carbon exchange price was preferred by the lead consultants (Marsden Jacob Associates) for carbon valuation as these values reflect prices for carbon based on observed market transactions.

- Market prices provide an accurate exchange value of carbon and allow more reliable calculation of the resulting benefit to local, national and global beneficiaries. In comparison, the ACCU exchange value is derived from the funding awarded to projects by the Commonwealth's Emissions Reduction Fund. The weighted average price of ACCU's purchased represents a proxy for carbon prices in Australia but does not explicitly represent an exchange value.

Q: Why do we include both welfare and exchange values?

A: The exchange value is used in the UN SEEA as it is conceptually consistent with the system of national accounts, of which GDP is a core indicator. GDP measures economic productivity - not the wellbeing of Australians. However, sometimes policymakers are more interested in measures of wellbeing including welfare values.

- The welfare value is presented to demonstrate the potential gap between the value the market currently places on the benefits from GKP and the benefits available to society.
- Different policy questions will require different information to answer questions. The exchange value is used when questions relate to economic productivity, and where consistency with the system of national accounts is important. Welfare values are more useful when considering the improvements in the wellbeing of Australians.
- From Dasgupta:
 - *Economists have long advocated that the criterion for project appraisal should be the net present value (NPV) of the flow of social benefits. The idea is to measure the flow of benefits, net of costs, in terms of the accounting values of the flow of goods and services. The procedure then involves summing the flow of net benefits, discounted at social discount rates. But summing a project's benefits over time amounts to the change in inclusive wealth that would be brought about by the project. It is entirely satisfying that a criterion long in use in social cost-benefit analysis matches the requirement that policy analysis should be conducted in terms of the effect of policies on inclusive wealth. Notice though, there is no connection between GDP and the NPV of investment projects. To advocate the use of GDP to measure economic progress while advancing NPV as the criterion for project appraisal is bad economics. We have no explanation for why the two have managed to survive simultaneously.*
- Because of the consistent approach that is taken to the biophysical elements of the ecosystem accounts under UN SEEA the estimation of welfare values are more reliable. This is because the estimates of welfare would be all based on a consistent set of biophysical data, as compared to the current approach where every estimate is likely to use a different physical basis.