

# Considering the environment in national strategic thinking

Forum sponsored by the Department of Agriculture,  
Australia21 and the Crawford School of Public Policy,  
Australian National University

Australian National University  
15th November, 2013



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# Contents

<b>Glossary and acronyms</b> .....	<b>4</b>
<b>Executive summary</b> .....	<b>5</b>
This forum.....	5
Benefits to people from natural environments.....	5
Opportunities to tackle wicked problems.....	6
The UK experience demonstrated the benefits of including the environment and diverse stakeholders in national strategic thinking.....	6
Australia has taken steps towards better strategic dialogue about the environment and human well being.....	6
But there are several opportunities for Australia to do much better .....	7
Looking to the future.....	7
Conclusions.....	8
Next steps.....	8
<b>Introduction</b> .....	<b>9</b>
This forum.....	9
Propositions .....	10
Setting the scene.....	10
<b>Benefits to people from natural environments</b> .....	<b>11</b>
<b>The UK experience demonstrated the benefits of including the environment and diverse stakeholders in national strategic thinking</b> .....	<b>13</b>
About the UKNEA.....	13
At its heart was the ‘ecosystem approach’ .....	13
An ecosystem services framework and language encouraged broad strategic dialogue – but effort was required to explain why valuing the environment is a government-wide issue .....	15
New, and better, strategic insights.....	16
Ecosystems as infrastructure.....	17
Institutional silos are a major impediment to national strategic thinking .....	17
Other key lessons .....	17
Follow-on phase.....	18
<b>Australia has taken some steps towards better strategic dialogue about the environment and human well being, but has stopped short in key ways</b> .....	<b>19</b>
Ecosystem services frameworks are being used strategically in some regions.....	19
Australia has some national survey data, and plans to collect more.....	19

Some Australian Government departments have explored using ecosystem services frameworks ....	20
Non-government organizations also use ecosystem services frameworks to varying degrees.....	21
Ecosystem-services frameworks and language have been useful in engaging stakeholders at local scales .....	22
Institutional silos are also an impediment in Australia .....	23
Australia's government has not made integrating the environment with other aspects of policy development a high priority .....	23
New institutions might be needed .....	23
<b>Looking to the future.....</b>	<b>25</b>
Progress to date .....	25
Little evidence that Australian thinking is heading in the direction of system-level strategic assessments.....	26
Responsibility and leadership must go beyond government .....	27
Next steps.....	27
<b>Conclusions, including suggestions from working groups .....</b>	<b>28</b>
Suggestions from working groups in summary .....	28
The importance of common language was recognised.....	28
There is an appetite for developing some products, for use by governments and other sectors, that clarify and adapt language, concepts and frameworks from other parts of the world in the context of Australia's particular culture, environments and approaches to decision-making .....	29
There was support among many Forum participants for a national dialogue of the sort facilitated by the UKNEA .....	30
Immediate next steps .....	30
<b>Appendix 1: Programme .....</b>	<b>31</b>
<b>Appendix 2: Speaker biographies and abstracts.....</b>	<b>34</b>
<b>Appendix 3: Reports from working groups .....</b>	<b>48</b>

## Glossary and acronyms

A21	Australia21, a not-for-profit research and development organisation, which prepared the report on ecosystem services ( <a href="http://www.daff.gov.au/natural-resources/ecosystem-services/ecosystem-services-report">http://www.daff.gov.au/natural-resources/ecosystem-services/ecosystem-services-report</a> ) for DAFF, on which this Forum was based ( <a href="http://www.australia21.org.au">www.australia21.org.au</a> )
ABS	Australian Bureau of Statistics
BoM	The Australian Government's Bureau of Meteorology
DAFF	The Australian Government's Department of Agriculture, Fisheries and Forestry, which commissioned the A21 report on ecosystem services and was the primary funder of the Forum. DAFF became Department of Agriculture in 2013
EPBC Act	The Environment Protection and Biodiversity Conservation Act (1992)
ESP	Ecosystem Services Partnership ( <a href="http://www.es-partnership.org/esp">http://www.es-partnership.org/esp</a> ), an international network that supports and promotes thinking and dialogue about benefits to humans from nature.
UKNEA	The United Kingdom's National Ecosystem Assessment ( <a href="http://uknea.unep-wcmc.org">http://uknea.unep-wcmc.org</a> ), a national assessment based on the concept of ecosystem services and embedding this concept in decision-making at multiple levels. Professor Roy Haines-Young, Nottingham University, gave a presentation on the UKNEA at this Forum
MEA	The Millennium Ecosystem Assessment ( <a href="http://www.maweb.org">http://www.maweb.org</a> ), an international assessment that considered the past, present and future relationships between ecosystems and human well-being.
TEEB	The Economics of Ecosystems and Biodiversity ( <a href="http://www.teebweb.org">http://www.teebweb.org</a> ), an international programme that explored the ways in which the natural environment provides benefits to humans. TEEB was stimulated by the MEA.

## Executive summary

### This forum

This forum considered key propositions arising from a 2011 discussion paper by Australia21 (A21):

- Australia would benefit greatly from better national strategic thinking about its future that:
  - involves people from across all sectors of Australian society, and
  - includes consideration of the interactions between humans and the natural environment that affect human social and economic well-being as well as the status of other species.
- Recent thinking about how to describe and assess the benefits that people get from the natural environment have provided language and concepts that can support such strategic thinking.

Around 100 people attended, representing commonwealth and state governments, non-government organizations, CSIRO, Australian and overseas universities, farmers, industry and community bodies, farmers, and other private individuals.

Copies of presentations can be found on the A21 web site at: <http://www.australia21.org.au/research-archive/australians-in-the-landscape-2/ecosystem-services/presentations-from-november-15th-forum/#.UtdxpaWBJr4>.

### Benefits to people from natural environments

The term 'ecosystem services' is commonly used to describe the ways in which processes in ecological systems (ecosystems) contribute to human social and economic well-being (Table 1).

**Table 1: A typical classification of ecosystem services**

Category	Description and examples
<b>Provisioning services</b>	Services that lead to the provision of goods essential for human well-being, including: food; clean water; building materials; fibre; and medicines
<b>Regulating services</b>	Services that lead to regulation of the environments in which people live, including: regulation of air quality; regulation of climate and weather; mitigation of floods and other extreme events; stabilisation of soils, waterways and landscapes; and control of pests and diseases
<b>Cultural services</b>	Services that lead to cultural, spiritual and emotional fulfillment and mental and physical health, including: educational and recreational opportunities; sense of place and cultural connection; and spiritual experiences
<b>Supporting services</b>	Processes that support other services, including: primary production, soil formation, nitrogen cycling, and pollination - some recent classification regard these as intermediate processes that are not direct services in their own right.

There is increasing interest in assessing the benefits from these services – in social and/or economic terms – and communicating them in everyday language to improve dialogue and decisions about the environment and its relationship to human well-being.

## Opportunities to tackle wicked problems

Australia faces many ‘wicked problems’ (complex problems that are hard to define and analyse, are interpreted differently by different parts of society, and often lead to conflicting views on solutions). Many have major environmental components. Examples include: population; water management; support for Indigenous Australians; immigration; food security; national security; environmental management and conservation.

The language of ecosystem services and similar concepts is one way to facilitate this sort of dialogue required to address wicked problems. Experts agree that tackling wicked problems requires broad and open dialogue to establish trust and common understanding of the issues. While not all stakeholders will agree on solutions, they are more likely to accept decisions because their viewpoints have been heard and considered.

## The UK experience demonstrated the benefits of including the environment and diverse stakeholders in national strategic thinking

The use of an ecosystem-services framework allowed the UKNEA to engage a wide range of people in assessment of the state of the environment and in strategic thinking about the UK’s future. The United Kingdom’s National Ecosystem Assessment (UKNEA), which passed through several phases between 2007 and 2011, aimed to embed ecosystem-services thinking within policy processes in the UK.

Ecosystem-services language was successfully aligned with the language of economics and finance spoken by many of the most influential government agencies (Treasury, Finance and Prime Minister’s departments). This included considering how the environment can contribute to national infrastructure and to real growth in the economy and human well-being.

Considering all benefits from the environment to society, including ones that are not at present traded in markets, often resulted in options likely to produce higher overall values to society than the conventional focus on market-priced goods alone.

There was strong demand from community groups, businesses, academics and government and non-government organisations to be involved, leading to many public-private partnerships.

## Australia has taken steps towards better strategic dialogue about the environment and human well being

It was acknowledged that many of the elements required for a national strategic dialogue about the role of the environment in Australia’s future are already being developed here.

Collection of relevant information is being reviewed and, hopefully, improved. The National Land and Water Resources Audit in the early 2000s provided national baseline data on the state of natural environments. The Bureau of Meteorology and the Australian Bureau of Statistics reported on the strategic collection of further environmental information and development of national approaches to environmental-economic accounts.

Ecosystem services language is being used by government and non-government agencies. The Department of the Environment and the Department of Agriculture reported on how they use ecosystem services language to communicate with stakeholders, with varying degrees of success. The National Farmers Federation and a leading farmer gave examples of how this style of thinking is creating opportunities for land managers to manage for multiple societal benefits. The non-government environment organisations WWF and ACF both reported that the language of ecosystem services is allowing them to develop public-private partnerships to manage key environmental infrastructure.

Ecosystem services and resilience frameworks have been developed and used successfully by communities in Australia. Several speakers gave examples of how regional and urban communities are using these frameworks to think and plan strategically about future environmental management.

### But there are several opportunities for Australia to do much better

The UKNEA showed the importance of government making strategic dialogue about the role of the environment in a country's future a national priority, which is not currently the case in Australia.

Major impediments relate to information and institutional arrangements. Both this Forum and the A21 report suggested that, despite the advances reported above, there remain critical gaps in information that limit our ability to assess the contributions of ecosystem services to human well-being at a national scale. Various possibilities for improving institutional arrangements have been identified, but chief among these is addressing the practice of partitioning complex problems into parts that are addressed by different departments with little cross-fertilisation.

Daniel Connell illustrated this issue using the Murray Darling Basin. He concluded that Australia is still not good at taking a whole of system approach to managing the multiple social, economic, environmental and other issues that intersect with natural resource management. This, he argued, is largely because, under current institutional arrangements, it is easier to break complex problems into pieces and deal with them separately, despite the attendant risk of perverse outcomes.

John Williams identified several immediate strategic priorities on behalf of the Wentworth Group of Concerned Scientists: Land-use planning and environmental regulation to maintain a healthy environment and to promote development; strengthening regional natural resource management authorities; building a system of National Environmental Accounts to inform investment and policy decisions; securing Australia's conservation estate and taking effective action to protect threatened species; using markets to repair and maintain natural capital.

In a comparison between approaches in Europe, North America and Australia, Simone Maynard argued that Australia should develop products that clarify principles and provide guidance about the nature of ecosystem services and benefits for use within government and in dialogue across government, industry and the broader society.

### Looking to the future

John Williams concluded that: 'The future therefore depends upon the evolution of a more subtle and resilient story about human-earth interactions, in which energy, water and climate are central and



where a new story evolves to empower a transition to a society that lives within the means of a finite planet and improves global well-being at the same time’.

Professor Robert Costanza concluded that an important next step should be considering much richer scenarios for Australia’s social and ecological futures than have been developed previously. Such scenarios should consider the full spectrum of interactions between humans the natural environment and should be supported by the sort of national strategic conversations exemplified in the UKNEA. Attempts to encourage such national conversations are being made by numerous groups around Australia, but they require stronger support from national leaders to be effective.

## Conclusions

The following conclusions were drawn by the organisers, from the presentations and discussion at the Forum, including the recommendations of working groups:

- Australia faces several wicked problems that have major environmental components.
- There was strong recognition that addressing these wicked problems would be assisted by national-scale, cross-society dialogue to help all interest groups achieve common understanding about how the environment interrelates with other aspects of life and how these interrelationships might develop in Australia’s possible futures.
- There was strong recognition of the importance of a common language to allow governments to talk meaningfully with other sectors of society about the role of the environment in Australia’s future, and for parts of government to talk meaningfully with one other.
- Concepts, frameworks, and case studies are now available to develop a common language, and there was strong support among bureaucrats, scientists, non-government organisations, industry bodies, community groups and others for products that explain and promote such a language.
- Some of the institutional arrangements to support national strategic thinking are in place or under development (e.g., networks for collecting and interpreting key information and refining concepts) but other institutions (e.g., forums for broader conversation, like those provided by the UK’s National Ecosystem Assessment) are absent or poorly developed.
- The concept of the environment as another form of essential infrastructure is a promising platform for engaging most sectors of Australian society in strategic thinking about the nation’s future and cooperative public-private actions for the common good.

## Next steps

Several participants in the Forum suggested that a cross-sector working group should be established. This would bring together businesses, government and non-government organizations, researchers and others to encourage dialogue about how benefits from the environment can be integrated better into national policy and the thinking of political leaders. Australia21 is exploring how it might take a facilitation role, recognizing that several organizations are already making substantial progress.



# Introduction

## This forum

This forum followed from a 2011 discussion paper,<sup>1</sup> by Australia21 (A21), on ecosystem services to the then Department of Agriculture, Fisheries and Forestry (DAFF). This forum was convened to consider some of the key propositions arising from the A21 report (see below).

An open invitation was issued and distributed through government-stakeholder networks, the Australian National University's seminar notification system and Australia21's distribution network. Over 120 people (registered to receive details of the forum and this report (around 100 attended on the day). Participants represented Commonwealth and state governments, non-government organizations, CSIRO, Australian and overseas universities, farmers, industry and community bodies, farmers, and other private individuals (Table 2). The participation was heavily skewed towards Commonwealth government agencies and Australian universities.

**Table 2: Registrations for this Form**

Affiliation	Number of people registered
Community organisations	2
Commonwealth government	51
Consultants	8
CSIRO	7
European Union	1
Farmers	2
Industry peak bodies	4
Overseas universities (UK, Denmark, USA)	3
Non-government Organisations	9
Private individuals	2
Research & Development Corporations	2
State government	5
Australian universities	27

The forum was structured around four keynote presentations from leading researchers with experience applying the concept of ecosystem services thinking to policy and management challenges, two panel sessions drawing on the experiences of people from government, industry and non-government environment organizations, and a time in the final session of the day for attendees to form working groups to consider key issues that had emerged.

The programme for the day is given in Appendix 1, and Appendix 2 includes abstracts and biographies of speakers. Appendix 3 summarises the considerations of the working groups. Copies of presentations can be found on the A21 web site at: <http://www.australia21.org.au/research-archive/australians-in-the-landscape-2/ecosystem-services/presentations-from-november-15th-forum/#.UtdxpaWBJr4>.

<sup>1</sup> [www.daff.gov.au/natural-resources/ecosystem-services](http://www.daff.gov.au/natural-resources/ecosystem-services)

Speakers and other participants in the Forum were encouraged to consider and discuss the conclusions of the Australia21 report, but not necessarily agree.

## Propositions

Two propositions advanced by the A21 report formed the starting point for the Forum:

- that Australia would benefit greatly from better national strategic thinking about its future that:
  - involves people from across all sectors of Australian society; and
  - includes consideration of the interactions between humans and the natural environment that affect human social and economic well-being as well as the status of other species
- that recent advances in thinking about how to describe and assess the benefits that people get from the natural environment have provided language and concepts that can support such strategic thinking.

## Setting the scene

In setting the scene for this forum, Professor Steven Cork reviewed key literature from public administrators, strategic analysts, business leaders, economists and others (including the seminal work by the Australian Public Service Commission 'Tackling Wicked Problems') making the case that Australia faces numerous 'wicked problems' (complex problems that are hard to define and analyse, are interpreted differently by different parts of society, and often lead to conflicting views on solutions). Example include: population; water management; treatment of Indigenous Australians; immigration; food security; national security; environmental management and conservation. Experts agree that tackling such problems requires broad and open dialogue to establish trust and common understanding of the issues. This does not guarantee agreement on solutions, but it offers the possibility that actions by decision makers will be accepted because different viewpoints have been heard and considered. Professor Cork argued that many of these wicked problems have an environmental component and that the sort of language developed around ecosystem services and similar concepts allows people from across broad sectors of society to engage in productive strategic conversations about how the environment and human well-being might interact.

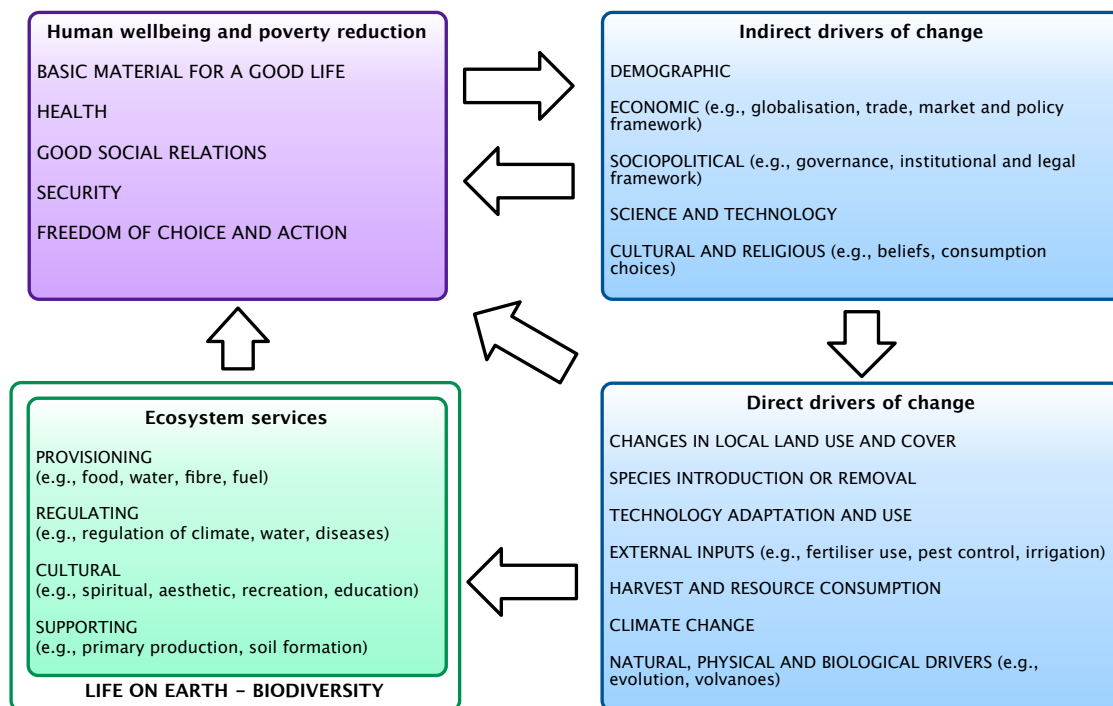
Professor Cork summarised key developments over the past decade, including improvements in the definitions of processes, services and benefits, so that ecosystem services language aligns better with the languages of ecology and economics and so that double-counting in environmental-economic accounts can be minimised. These aspects were previously barriers to adoption of ecosystem services frameworks for some decision-makers.

Finally, two key questions were posed:

- Are governments in Australia able and willing to engage in strategic conversations about Australia's future across government and across society (or are they, for example, constrained to only ever deal with parts of complex problems related to the responsibilities of individual departments)?
- Are other parts of society able and willing to play a role in encouraging strategic conversations about Australia's future?

## Benefits to people from natural environments

The term 'ecosystem services' is commonly used to describe the ways in which processes in ecological systems (ecosystems) contribute to human social and economic well-being. Other terms have been used, such as 'environmental services' and 'nature's benefits'. The use of the term 'ecosystem' was originally intended to convey the importance of many species interacting with one another and with the non-living environment in the provision of benefits like provision of soil in which crops can grow, purification of water, stabilisation of landscapes, and control of pests. Frameworks have been developed for naming and classifying ecosystem services and relating them to both drivers of change (which influence ecosystem processes) and human well-being (to which ecosystem services contribute (Figure 1).



**Figure 1: A simplified version of the conceptual framework relating drivers of change, ecosystem services and human well-being from the Millennium Ecosystem Assessment.**

Most classifications include components like the following:

- Provisioning services (services that lead to the provision of goods essential for human well-being, including: food; clean water; building materials; fibre; and medicines)
- Regulating services (services that lead to regulation of the environments in which people live, including: regulation of air quality; regulation of climate and weather; mitigation of floods and other extreme events; stabilisation of soils, waterways and landscapes; and control of pests and diseases)
- Cultural services (services that lead to cultural, spiritual and emotional fulfilment and mental and physical health, including: educational and recreational opportunities; sense of place and cultural connection; and spiritual experiences)
- Supporting services (processes that support other services, including: primary production, soil formation, nitrogen cycling, and pollination - some recent classification regard these as intermediate processes that are not direct services in their own right).

Increasingly, it has been found that the benefits from these services can be assessed and, often, measured in economic terms that allow them to be considered along side more obvious financial benefits in decision-making. Although economics has long sought to make such assessments, the development of simple terms and concepts, like those in the dot-points above, have made it easier for groups of people from different backgrounds to be involved in productive conversations about their relationships with the natural world and how their decisions might affect their own well-being in previously unrecognised ways. A prime example is the foregoing of development in water catchments, which has been shown for many towns and cities around the world to be far more beneficial economically than allowing development that reduces the ability of the catchment to provide the ecosystem service of water purification.

The A21 report reviewed progress in relation to the concept of ecosystem services. Various speakers in the Forum also mentioned progress in several areas:

- clearer and more consistent frameworks relating the processes that occur in ecosystems to the ways in which these processes can be made use of by humans, the types of benefits provided and the beneficiaries;
- tools for assessing the state of ecosystems and their ability to meet demand for benefits from humans;
- complex models of the interactions between humans and ecosystems at a range of spatial scales, leading to maps and other support for tactical and strategic decision-making; and
- development of language, concepts and frameworks that link thinking about ecosystem services to similar thinking in other disciplines (including economics, business, and social science).

It was noted that a journal titled 'Ecosystem Services' has now started and that the number of publications on this topic has grown exponentially in the past decade.

Several major national and international projects - including the Millennium Ecosystem Assessment (MEA), The Economics of Ecosystems and Biodiversity (TEEB) and the UKNEA - have focused successfully on embedding this sort of thinking in government and business decision-making. An international network called the Ecosystem Services Partnership (ESP) has been established to facilitate dialogue among ecosystem services researchers and practitioners.

# The UK experience demonstrated the benefits of including the environment and diverse stakeholders in national strategic thinking

## About the UKNEA

The first keynote speaker was Professor Roy Haines-Young, from the University of Nottingham in the United Kingdom. Professor Haines-Young played a key role in the UK's National Ecosystem Assessment (UKNEA).<sup>2</sup> The UKNEA (<http://uknea.unep-wcmc.org>) provided a comprehensive overview of the state of the natural environment in the UK and a new way of estimating national wealth. It produced, in 2011, a white paper aimed at embedding ecosystem services thinking within the policy environment and processes of the UK. This white paper followed from scoping and commissioned research between 2007 and 2010, which were stimulated by a national sustainable development strategy and an action plan. The UKNEA process involved close collaboration between experts, clients and users.

The six guiding principles of the UKNEA were:

- taking a more holistic approach to policy-making and delivery, with the focus on maintaining healthy ecosystems and ecosystem services;
- ensuring that the value of ecosystem services is fully reflected in decision-making;
- ensuring environmental limits are respected in the context of sustainable development, taking into account ecosystem functioning;
- taking decisions at the appropriate spatial scale while recognising the cumulative impacts of decisions;
- applying adaptive management of the natural environment to respond to changing pressures, including climate change; and
- identifying and involving all relevant stakeholders in the decision and plan making process.

## At its heart was the 'ecosystem approach'

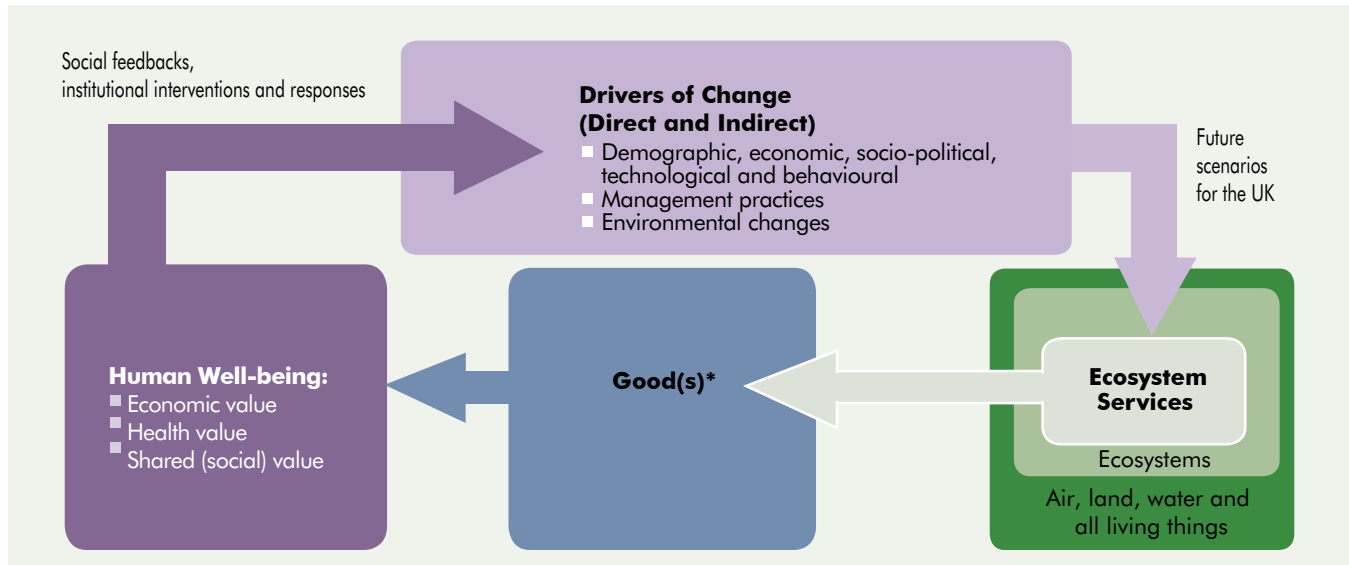
The UK's Department for Environment, Food and Rural Affairs (DEFRA) recognised a need for a holistic (system-level) underpinning for policy making, based on the principle that maintaining healthy ecosystems ensures the delivery of benefits from nature to people (Figure 2). This philosophy is based

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<sup>2</sup> Professor Haines-Young's presentation is available on Australia21's web site at: <http://www.australia21.org.au/research-archive/australians-in-the-landscape-2/ecosystem-services/presentations-from-november-15th-forum/#.UtdxpaWBJr4>



on the twelve principles of the 'ecosystems approach', as adopted by Parties to the Convention on Biological Diversity (<https://www.cbd.int/decision/cop/default.shtml?id=7148>). These are the same twelve principles recommended to the Australian Government in 2011 in the review of the Environment Protection and Biodiversity Conservation ACT (EPBC Act)<sup>3</sup> and recognized as being consistent with both recent and planned future national approaches to conservation in Australia.<sup>4</sup> These principles were clearly embedded in the approaches to environmental policy described by all speakers from Australian Government departments in the morning panel session of this Forum. Similar principles were espoused by John Williams, on behalf of the Wentworth Group of Concerned Scientists.



**Figure 2: Conceptual framework for the UKNEA,<sup>5</sup> showing the links between ecosystems, ecosystem services, good(s), valuation, human well-being, change processes and scenarios. Note that the term good(s) includes all use and non-use, material and non-material benefits from ecosystems that have value for people.**

<sup>3</sup> Australian Government (2011) The Australian Environment Act: Report of the Independent review of the Environment Protection and Biodiversity Conservation Act 1999 - Final report. Australian Government, Canberra, <<http://www.environment.gov.au/system/files/resources/5f3fdad6-30ba-48f7-ab17-c99e8bcc8d78/files/final-report.pdf>>. Note: The principles are explicitly mentioned in point 1.45 on page 57, but are implied throughout the report by reference to the 'ecosystem approach' or similar words, and are reflected in a range of the recommendations.

<sup>4</sup> Australian Government (2011) Australian Government Response to the Report of the Independent Review of the Environment Protection and Biodiversity Conservation ACT 1999. Australian Government, Canberra, <<http://www.environment.gov.au/system/files/resources/605a54df-7b33-4426-a5a8-51de24b29c71/files/epbc-review-govt-response.pdf>>. Note: The responses to the review of the EPBC Act do not specifically refer to the 12 principles but do state that Australia's Biodiversity Conservation Strategy shares the same principles of a whole-of-ecosystem approach to conservation as the Convention on Biological Diversity. The biodiversity strategy and the responses together show support for most of the 12 principles, including the importance of understanding ecosystem functions, undertaking actions at relevant scales, recognizing interactions between human society and ecosystems, considering the roles and influences of markets, and considering all forms of relevant information, including scientific, Indigenous and local knowledge.

<sup>5</sup> UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge, UK.

## An ecosystem services framework and language encouraged broad strategic dialogue – but effort was required to explain why valuing the environment is a government-wide issue

The use of an ecosystem services framework and language at the core of the UKNEA did allow a wide range of people to be involved in the assessment and subsequent strategic thinking about a number of scenarios for the UK's future. It was found that some of the concepts and language had to be modified to connect with the language of economics and finance spoken by many of the most influential government agencies (i.e., Treasury, Finance and Prime Minister's departments).

A key message to Whitehall was that the environment is important in many policy areas, including:

- public health
- economic growth
- sustainable businesses
- education
- culture
- climate change
- sustainable transport

In particular, it was necessary to consider how ecosystem services might relate to policy objectives of 'economic growth'. This was not a problem, as the language and concepts of ecosystem services do not include any value judgments or ideological tenets (i.e., the concept seeks merely to identify what benefits are possible under different decisions – consideration of which mixes of ecosystem and other benefits is most desirable must then be based on the value judgments of those including in the decision-making process).

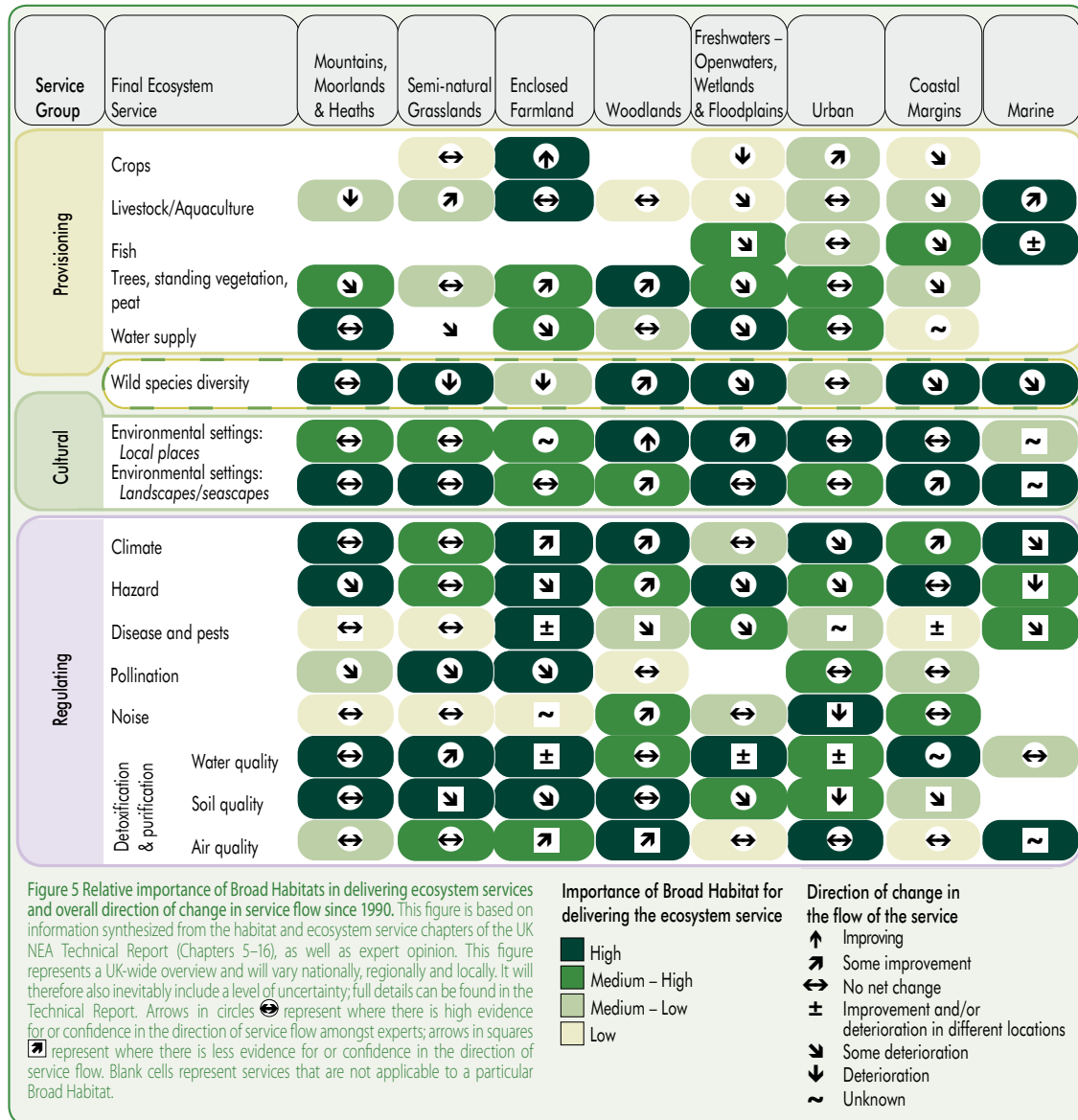
Similarly, the UKNEA was communicated with slogans like: "Ask not what you can do for nature – ask what nature can do for you". This picks up on the central thrust of ecosystems-services thinking, which is that many of the relationships between people and nature can be considered in the same way as we conceive the giving and taking of services in business environment. Slogans like the one above were thought to be a good way to 'change the terms of the debate' and to connect with those in the general public and businesses who are used to thinking of the environment as something separate from mainstream life – and perhaps something that is a responsibility rather than as asset. Some people, however, in both the UK and Australia, object to this as over-commercialisation of nature.

There was strong demand from community groups, businesses, academics and government and non-government organisations to be involved in the UKNEA. Once this opportunity was provided, it was necessary to encourage high-quality involvement by identifying champions within major government and non-government sectors. In this way, it was possible to consider several scenarios for the future of the UK that involved different approaches to managing the interactions between people and the environment.



## New, and better, strategic insights

The UKNEA provided assessments of how the state of the environment in the UK is changing and how that is likely to affect the benefits obtained by people. It also communicated a large amount of complex information in readily understandable ways using an ecosystem services framework (Figure 3).



**Figure 3: Example from the UKNEA<sup>6</sup> showing how a large amount of information, about trends in the state of the environment and the benefits provided to humans, was communicated simply using an ecosystem services framework**

<sup>6</sup> UK National Ecosystem Assessment (2011) The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge, UK.

One of the most important lessons from the UKNEA is that bringing together information on how the environment and society interact, and using that to support cross-societal strategic thinking about a nation's future, yields important insights that are unlikely to be surfaced in less strategic and holistic thinking. Furthermore, many of those insights are counter to what is commonly thought by the public and even leading decision-makers.

Key conclusions of the UKNEA that resonated with non-environmental government agencies included:

- The conventional focus upon market-priced goods alone can result in decisions that produce lower overall values to society
- All the major ecosystem services generated by a change in resource use need to be assessed – spatially / temporally
- Significant value increases can be obtained from targeted planning by incorporating all potential services and their values and that this approach also conserves biodiversity

### Ecosystems as infrastructure

Another way in which ecosystem services language was brought into better agreement with the language of non-environmental government agencies was to recognise that ecosystems can be considered as a type of infrastructure that, like other infrastructure, can be used to deliver services to society. As pointed out by Paul Sinclair (ACF), a similar conversation is being developed in Australia around 'green infrastructure' (e.g., the forests of the Great Dividing Range that provide a range of ecosystem services to towns and cities along Australia's east coast). The concept of green infrastructure also featured prominently in at least two previous national forums on ecosystem services in Australia, also supported in part by the (then) Department of Agriculture, Fisheries and Forestry.<sup>7 8</sup>

### Institutional silos are a major impediment to national strategic thinking

The silo approach to allocating responsibilities for public issues, which is typical of the UK and Australian governmental structures, remained a partial barrier to open, cross-societal dialogue. However, the focus of the UKNEA on easily recognizable benefits from nature to humans improved the ability of departments to talk with one another about complex social-ecological issues, and this might be the basis for future strategic conversations.

### Other key lessons

Other major lessons from the UKNEA included:

- Managing for ecosystem services must be done as part of a broader strategy.
- Assessments must be authoritative; assessments depend on partnerships.

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<sup>7</sup> Maynard S. (2011) An Australian Ecosystem Services Event. International River Symposium, Brisbane.  
<[http://archive.riversymposium.com/index.php?element=A3E\\_MAYNARD.pdf](http://archive.riversymposium.com/index.php?element=A3E_MAYNARD.pdf)>

<sup>8</sup> Maynard S., Landers D., Cork S. & Graymore M. (2011) Challenges and solutions to developing and applying riverine ecosystems services assessments. International River Symposium, Brisbane.  
<<http://archive.riversymposium.com/index.php?page=Proceedings>>

- There needs to be a legacy (i.e., if a nation embarks on such a process of information gathering and dialogue, it must have thought about how it plans to store and use the information and how the dialogue will be taken into decision-making processes in an on-going way).

While there are some examples already of the dialogue from the UKNEA being considered in government decision-making, it is still too soon to say how much it will change government's processes. Non-government sectors, on the other hand, have been enthusiastic about the possibilities of broader collaboration across society for dealing with complex social-ecological challenges.

### Follow-on phase

The UK Government is supporting a two-year long follow-on phase of the UKNEA, which will further develop and promote the arguments that the UKNEA put forward and make them applicable to decision and policy making at a range of spatial scales across the UK to a wide range of stakeholders. This phase includes both national and local initiatives. One national initiative is the National Capital Committee whose role is to help the Government better understand how the state of the natural environment affects the performance of the economy and individual well-being, and advise the Government on how to ensure England's 'natural wealth' is managed efficiently and sustainably. Local scale initiatives include various local nature partnerships, knowledge networks and schemes for paying land managers for environmental stewardship and producing ecosystem services and benefits (such as purification of water, and regulating flood risk).

## Australia has taken some steps towards better strategic dialogue about the environment and human well being, but has stopped short in key ways

Ecosystem services frameworks are being used strategically in some regions

In setting the scene for the Forum, Professor Cork pointed out that community groups, regional bodies and researchers have been applying ecosystem services frameworks to analyse how the state of the environment is changing and how that potentially affects the well-being of people in several regions around Australia. These analyses have supported strategic conversations about how social, economic and environmental aspects of planning and management can be integrated to enable better preparation for multiple plausible futures. Such regions include: southeast Queensland; Central West NSW; Namoi NSW; Goulburn Broken Victoria; and Onkaparinga South Australia. Figure 4 is an example of how such an approach has been applied recently to the Murray-Darling Basin. Professor Cork pointed out that even though this analysis is imperfect, due to limited information availability, it nevertheless provides a basis for strategic conversations among stakeholders about future options.

Australia has some national survey data, and plans to collect more

Among workshop participants there was considerable enthusiasm for the sort of dialogue generated by the UKNEA to be encouraged in Australia. Few participants, however, thought that the same process as used in the UK should be considered in Australia. This is mainly because many of the elements of nation-wide assessment of the environment have already been attempted in Australia, or are being developed.

For example, the National Land and Water Resources Audit in the early 2000s was a national audit of the state of natural resources.

At the Forum, speakers from the Department of Meteorology (BoM) and the Australian Bureau of Statistics (ABS) reported on the substantial progress being made towards including measures of the extent and quality of natural resources in national accounts, and the ways in which ecosystem services are being considered for inclusion in:

- collection of new data and development and explanation of approaches to environmental accounting as part of the National Plan for Environmental Information (<http://www.bom.gov.au/environment/activities/accounts.shtml>), and

- application of the System of Environmental-Economic Accounts (SEEA) (<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4628.0.55.001main+features10May+2012>).

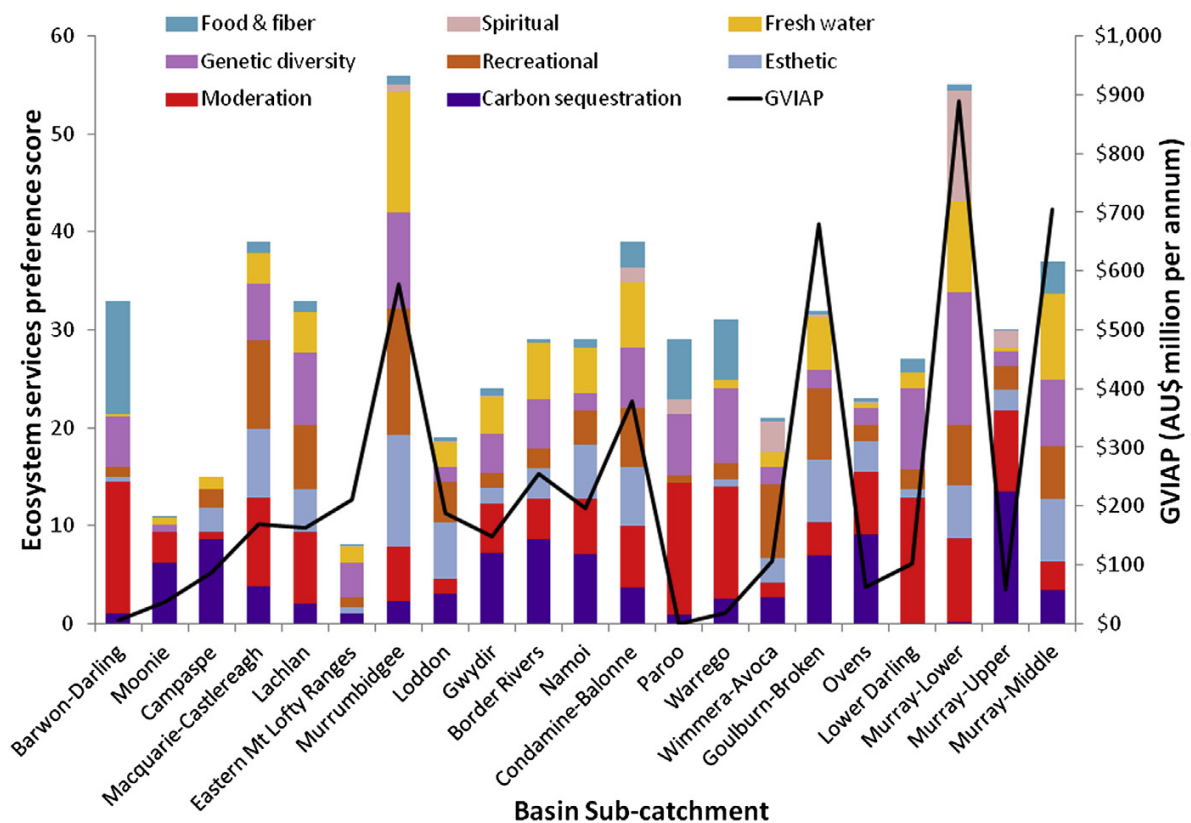
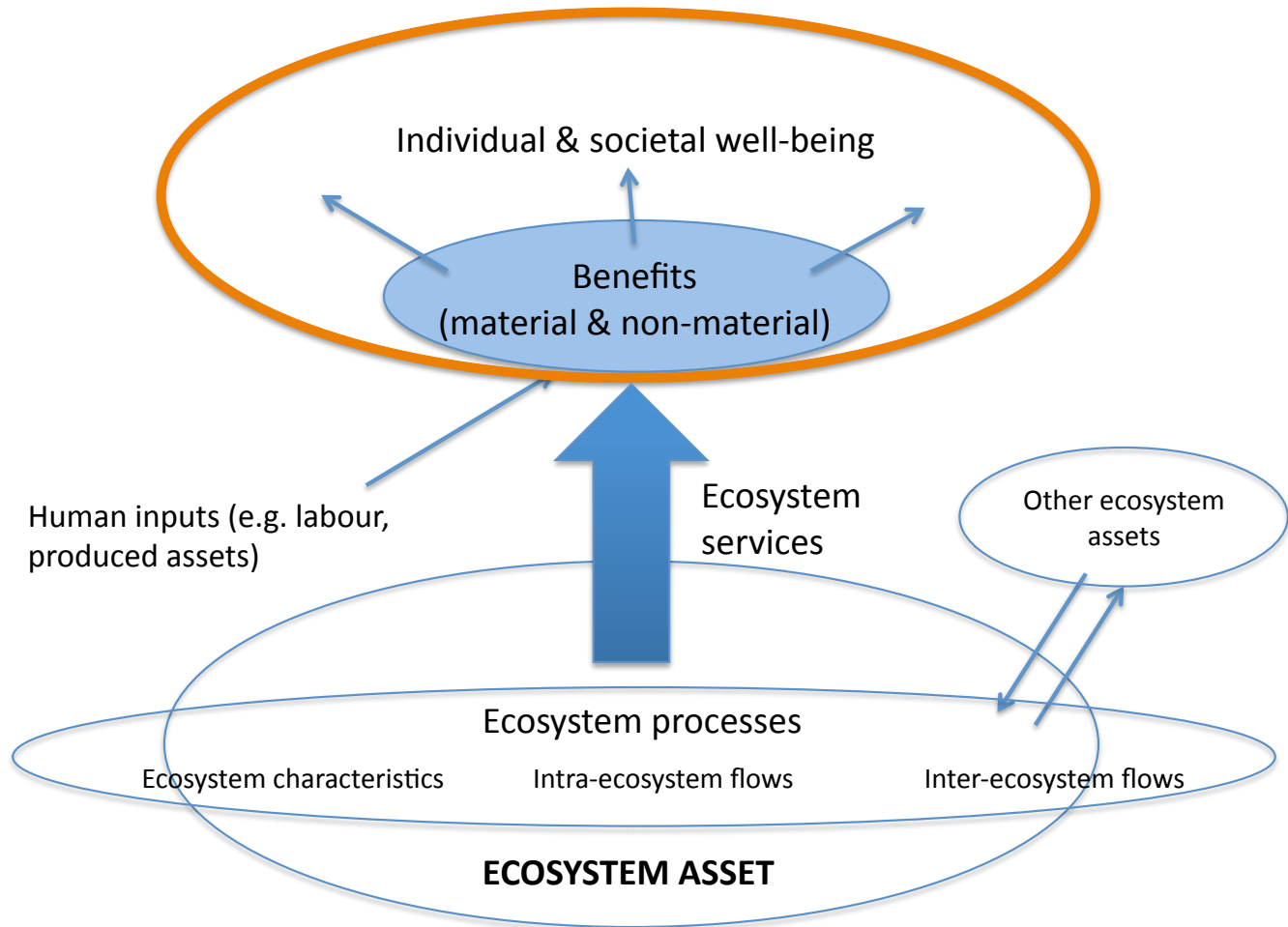


Figure 4: Recent study by Liu et al.<sup>9</sup> comparing perceptions about the importance of ecosystem services (preferences expressed in surveys of a focus group and the public) in a range of sub-catchments in the Murray-Darling Basin. Also shown is the gross value of irrigated agricultural production (GVIAP) in each sub-catchment.

## Some Australian Government departments have explored using ecosystem services frameworks

Speakers from the Department of the Environment and the Department of Agriculture reported on how they already use ecosystem services language to communicate with stakeholders, with varying degrees of success. They both also gave the opinion, however, that current data provide general guidance only and that significant gaps still exist, especially in relation to mapping of natural resources (especially the condition of the resource base). Similarly, there is only limited understanding of the impacts of land management practices on the quality of the resource base, and the ecosystem services provided.

<sup>9</sup> Liu, S., Crossman, N. D., Nolan, N., and Ghirmay, H. (2013). Bringing ecosystem services into integrated water resources management. *Journal of Environmental Management* 129: 92-102.



**Figure 5: Conceptual framework for the System of Environmental Economic Accounts (from Richard Mount's presentation)**

The Department of Environment recently released the 'Cleaner Environment Plan' (November 2013) with themes around clean water, clean air and clean land, as part of an effort to counter the perception that the environment is a drag on the economy. Better information on contributions of the environment to national accounts will encourage informed dialogue on this topic.

The Department of Agriculture has commissioned several reports in the past few years to clarify the concept of ecosystem services in relation to agricultural systems, including soil. Future opportunities for both departments include developing a currency for ecosystem services and making messages simpler for the public.

Non-government organizations also use ecosystem services frameworks to varying degrees

Deb Kerr (from the National Farmers Federation) and Sam Archer (a leading farmer and agricultural innovator) reviewed a series of other case studies in which markets and other incentives for better environmental management have been applied successfully by farmers, but both pointed out that this



is still a relatively short list. Deb Kerr posed the question whether these can grow or will they likely remain 'niche' market opportunities, suggesting that the latter is more likely. Sam Archer spoke of his personal experience of increasing the carrying capacity of his land by doing environmental projects that were originally for environmental benefits alone. It was agreed in subsequent dialogue that there are many such examples that have not yet been well documented.

Speakers from WWF and the Australian Conservation Foundation (ACF) both reported on how the language of ecosystem services is allowing them to talk strategically with businesses, governments and other sectors of Australian society to create new economic opportunities that also have major social benefits. Paul Sinclair (ACF) pointed out that 93% of the 80% of Australia's people who live within 50 km of the coast depend on the ecological integrity of the Great Dividing Range for their water supply and its quality. Sean Hoobin (WWF) reported that the Great Barrier Reef adds 6 billion dollars annually to Australia's economy.

John Williams outlined the thinking of the Wentworth Group of Concerned Scientists. He identified several immediate strategic priorities: Land-use planning and environmental regulation to maintain a healthy environment and to promote development; strengthening regional natural resource management authorities; building a system of National Environmental Accounts to inform investment and policy decisions; securing Australia's conservation estate and taking effective action to protect threatened species; using markets to repair and maintain natural capital. Subsequently John brought our attention to the considerable progress that has been made in NSW by catchment management organisations apply ecosystems services and resilience thinking to strategic thinking about current and future catchment management.<sup>10 11 12</sup>

## Ecosystem-services frameworks and language have been useful in engaging stakeholders at local scales

Simone Maynard and Steven Cork both gave examples of how ecosystem services frameworks have been developed by communities and used successfully to think strategically about future environmental management at local to regional scales. All speakers, however, reported mixed success in establishing and maintaining strategic dialogue between government and non-government sectors and across government itself at a national scale.

Simone Maynard's comparison of approaches to ecosystem services in Europe, the USA and Australia revealed there are many different ecosystem service assessment methodologies (frameworks) available for use. These frameworks were developed for different purposes, by different organisations with varying missions and mandates, at different scales and in different cultural and political environments; so no existing framework is directly transferable to an Australian context. She said that a participatory

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<sup>10</sup> Natural Resources Commission (2010) Progress Towards Healthy Resilient Landscapes: Implementing The Standard, Targets and Catchment Action Plans. Natural Resources Commission, Sydney.

<sup>11</sup> Ryan S., Broderick K., Sneddon Y. & Andrews K. (2010) Australia's NRM Governance System. Foundations and Principles for Meeting Future Challenges. Australian Regional NRM Chairs, Canberra.  
<[http://actnrmcouncil.org.au/files/NRM%20Governance\\_0.pdf](http://actnrmcouncil.org.au/files/NRM%20Governance_0.pdf)>

<sup>12</sup> Wilde B. (2013) Strategic Planning On The Coast: The Benefits Of Applying Systems And Resilience Approaches. In: 22nd NSW Coastal Conference 2013. East Coast Conferences.  
<<http://www.coastalconference.com/2013/papers2013/Bryce%20Wilde.pdf>>

stakeholder process at the national scale is required to develop a multi-scale ecosystem services framework specifically for Australia. Although the framework must allow flexibility of application by stakeholders, it would provide: a common language for strategic dialogue across them; tools for nested ecosystem service assessments from local to national scales; an opportunity to evaluate and monitor ecosystem services over long timeframes; and principles and guidance about the nature of ecosystem services and benefits for use by all stakeholders. The importance of developing a common framework was highlighted by the different ways in which ecosystem services is being applied in other countries (e.g. flood and hurricane mitigation, green infrastructure, biodiversity strategies, agricultural policy), with limited ability to repeat, transfer, up-scale, down-scale, communicate or integrate information across programs to better inform natural resource management and policy making.

### Institutional silos are also an impediment in Australia

The presentations at the Forum, and interviews reported in the A21 report, suggest that gaps in information and institutional impediments, especially the practice of partitioning complex problems into parts that are addressed by different departments with little cross-fertilisation, are the main impediments to achieving the sort of dialogue that the UKNEA achieved. It was acknowledged by some government bureaucrats at this Forum that one of their biggest challenges is to get key people from the relevant departments in the same room to think about the importance of environmental accounting and how to involve others such as states and private organizations, such as banks.

### Australia's government has not made integrating the environment with other aspects of policy development a high priority

It was suggested that one major difference between Australia and the UK is that, as evidenced by the UKNEA, the UK government sees reconciling social, environmental and economic aspects of policy as a national priority.

### New institutions might be needed

In setting the scene at the beginning of the Forum, Steven Cork asked whether there might be a need for better connections between existing institutions or even some new institutions to facilitate the sort of national strategic dialogue that the A21 report recommended. Research elsewhere around the world suggests that often the sorts of institutions that are missing are ones that provide links between existing government and non-government organizations and other interest groups within society, which otherwise would not communicate or cooperate effectively.<sup>13</sup> Several speakers and the working groups at this Forum concluded that there is a need to encourage a common language and better networks to support consideration of the environment in national strategic dialogue, suggesting that some key linkages are either absent or not functioning optimally.

Several other elements of the discussion at this Forum relate to the issue of institutional gaps.

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<sup>13</sup> Walker B., Barrett S., Polasky S., Galaz V., Folke C., Engstrom G., Ackerman F., Arrow K., Carpenter S. & Chopra K. (2009) Looming global-scale failures and missing institutions. *Science* 325, 1345.



As reflected by most speakers, especially Professors Cork, Haines-Young and Costanza, current ecological knowledge and thinking point to the importance of considering limits to resource use and/or degradation beyond which rapid, often irreversible, change that affects societies and economies is likely. Economics and policy-making processes struggle to deal with non-linear change, especially when the timing and location of that change is uncertain.

One institutional approach to dealing with environmental uncertainty at multiple spatial and temporal scales is to encourage monitoring, review and decision-making institutions at multiple scales (i.e., 'polycentric governance'). The UKNEA focused on embedding the ecosystem services concept to support decision making at local to national scales, which looks for signs that environmental limits are being approached, and prepares responses at an appropriate scales.

The development of national environmental accounting in BoM and ABS is seeking to emulate this approach to a degree. Some actions are being taken in the states (e.g., NSW has integrated Catchment Management Authorities and Livestock Health and Pest Authorities to form Local Land Services) are aimed at achieving integrated approaches.

Sam Archer, a Nuffield Scholar who spent a year studying institutions for environmental management overseas, advocates an independent, self-funded model, legislated but operated by an NGO, which encourages voluntary, non-prescriptive, whole of landscape management focused on marginal land (possibly called something like a 'national stewardship centre').

Sean Hoobin (WWF) argued that the scale of the challenge faced by the Great Barrier Reef, which is affected by decisions taken by a range of different levels of government and different landuses, requires an initiative of the scale of the Murray Darling Basin Plan, although he conceded that investment at this scale is unlikely in the current environment.

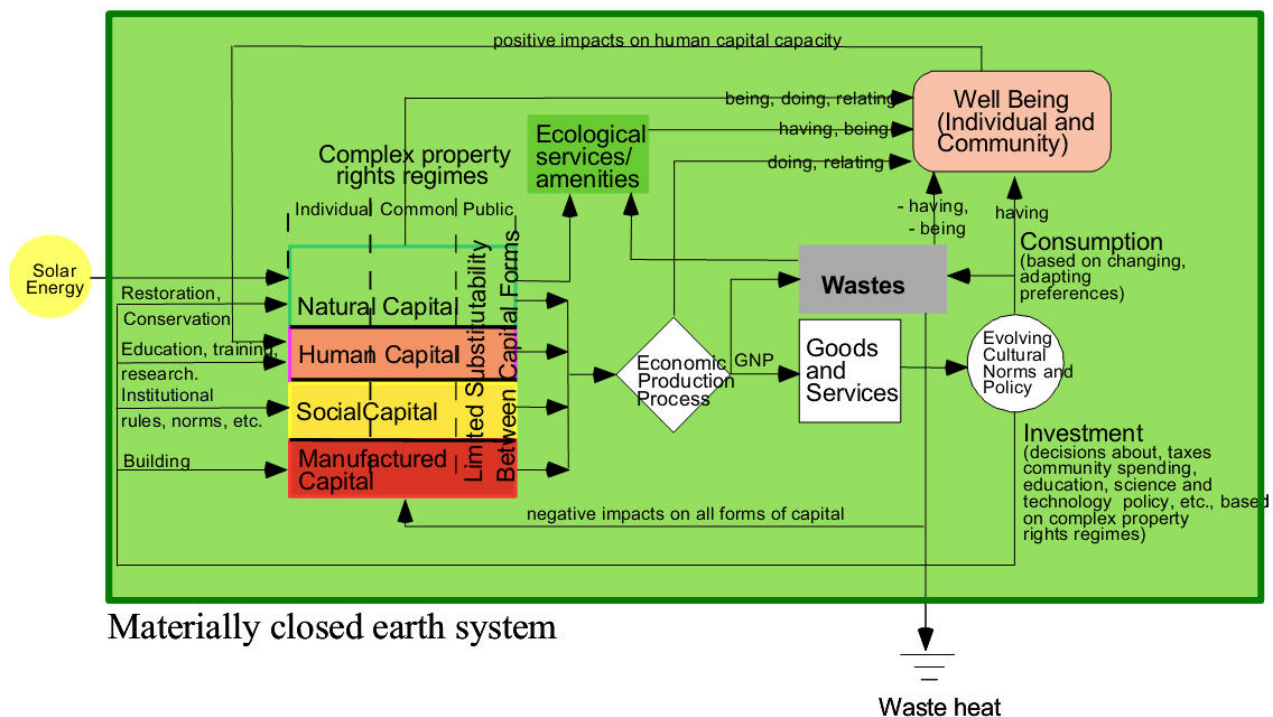
Paul Sinclair (ACF) also emphasised the importance of having institutions (government and non-government) capable of managing a natural asset as large as the Great Dividing Range, and the benefits it provides to a wide range of beneficiaries in different jurisdictions

The UKNEA emphasised the importance of building and maintaining a capacity for ongoing maintenance and momentum, particularly given that over the long run there are events such as changes in government, economic crises, and retiring champions that can stall progress and undermine strategic plans.

## Looking to the future

### Progress to date

Professor Robert Costanza reviewed progress in applying ecosystem services thinking in policy and management around the world. He explained how the concept of an empty world (i.e., a world in which there were more than enough resources to meet human needs and human actions had minimal effects on how the planet functioned) is being replaced by the realization that the world is now so 'full' of people that our actions significantly affect global resources and processes (Figure 6). Many scientists now argue that the world is entering a new era of world development that they call the 'Anthropocene' (the human-dominated era).



**Figure 6: Conceptual relationships between natural capital, other forms of capital, economic production and other parts of the earth system (from Professor Costanza's presentation and Costanza et al. 1997<sup>14</sup>)**

With this change in thinking, there is growing demand by decision-makers and citizens for language, concepts and tools that help us assess the needs of humans in relation to what the environment can provide. One manifestation of this demand is the growing realisation that Gross Domestic Product (GDP) is an inadequate measure of progress in terms of human well-being, and this is leading to

<sup>14</sup> Costanza R., Cumberland J. C., Daly H. E., Goodland R. & Norgaard R. (1997) An Introduction to Ecological Economics. St Lucie Press, Boca Raton.

growing interest in Genuine Progress Indicators (GPI). Both Professor Costanza and Professor Haines-Young reported that national leaders around the world are requesting briefings on how to promote strategic dialogue about well-being in relation to environmental management. Most speakers in the Forum echoed this message in one way or another. Professor Costanza reported that Australia's rate of genuine progress has been declining since 1997, due largely to declining natural capital.

Work by Professor Costanza and colleagues, the UKNEA and TEEB have shown that both market and non-market values from well-managed ecosystems are much higher than decision-makers have previously recognised. Government bureaucrats reported that they too want tools that will help them move from assessing success against individual programme's objectives to assessing the societal contributions of multiple programmes. Professor Costanza gave examples of how the state of the environment and production of ecosystem services scenarios about possible and desirable futures are re-emerging as a key platform for considering the environment in national strategic thinking

A centerpiece of the UKNEA was a set of scenarios for alternative UK futures. This was a device to help stakeholders engage with the uncertainties about how drivers of change and environmental, social, economic and other factors might interact to affect human well-being in the future. The scenarios had simple names: 'Green and pleasant land', 'Nature at work', 'World markets', 'Local stewardship', 'National security' and 'Going with the flow,' and tried to make the scenarios spatially explicit. The scenarios provided the basis for the economic valuation work, identifying market values and non-market aspects such as greenhouse gas emissions, recreation, urban green space.

Professor Costanza mentioned a project he is currently involved in that brings together past scenarios about Australia's possible futures and uses this synthesis as a way to generate dialogue across society about the futures that are possible and the ones that Australians would prefer. The scenarios have been synthesised and a survey is about to be conducted.

Also mentioned was the Australia 2050 project, initiated by the Australian Academy of Science to encourage thinking about pathways to sustainable futures by 2050. The second phase of that project (<http://www.science.org.au/policy/australia-2050/>) involved a workshop with around 60 prominent Australians in which participants were asked to explore and model the sorts of strategic conversations that might be required if Australians generally are to develop sufficient understanding of their own assumptions and those of others to engage in truly strategic dialogue about the future. The participants were asked to have a series of respectful conversations about how Australia might progress along four archetypical trajectories: continued growth; restraint; transformation; and catastrophe.

## Little evidence that Australian thinking is heading in the direction of system-level strategic assessments

Daniel Connell considered the Murray Darling Basin as an example of how Australia currently deals with complex issues involving interactions between society, the economy and the environment. He was pessimistic about the lack of progress that has been towards managing the multiple social, economic, environmental and other issues that intersect with water management. He concluded that the challenges have long been recognised and a lot of work has been done to address institutional issues (e.g., establishment of the Murray Darling Basin Commission, passing of the Water Act 2007, establishment of the Murray Darling Basin Authority, and development of the Murray Darling Basin

Plan) but that a key deficiency remains in the approach to managing water at this scale: The MDB plan focuses on key 'environmental assets' rather than 'systems', largely because it is easier with current institutions and mechanisms to identify and manage parts of a system than to manage the system, and its functions, as a whole.

## Responsibility and leadership must go beyond government

It is well documented that Australia differs from some other countries (like the USA) in having a strong reliance on government to deal with common-good issues like environmental management. The A21 report questioned whether this is unhelpful when managing ecosystem services, since private and public benefits accrue across society. Australia<sup>21</sup> had previously prepared a strategic plan for ecosystem services management that identified roles for all sectors of society.

The UKNEA also developed a national plan that included roles for funders, national agencies, research councils, local authorities, NGOs, businesses, utilities, government departments, scientific experts and others. To a large extent this plan involved empowering the 'willing and able', reflecting a lot of interest in this new kind of science.

There was a strong call for leadership in this area, but uncertainty about where it might come from.

Various initiatives were held up by Forum speakers as examples of partnerships and networks involving the whole of society (e.g. MEA, UKNEA, ABS/BOM/CSIRO collaborations, ESP, and Future Earth initiative <http://www.icsu.org/future-earth>).

It was suggested that Australian governments could play an important role in supporting strategic conversations about social, economic and environment interactions, but should not try to always lead these conversations. These ideas are based on initiatives in other countries (e.g., the USA and the UK, as described by Simone Maynard), where it was argued that assessments and dialogue should not be run by governments, but should occur independently as the leader needs to have scientific credibility, to be at arm's length of politicians, not be biased by politics, be flexible and not be short-sighted. This model appears to have been successful in engaging a wide range of stakeholders.

## Next steps

John Williams concluded that: 'The future therefore depends upon the evolution of a more subtle and resilient story about human-earth interactions, in which energy, water and climate are central and where a new story evolves to empower a transition to a society that lives within the means of a finite planet and improves global well-being at the same time'.

Professor Costanza concluded that an important next step should be considering much richer scenarios for Australia's future than have been developed previously. Such scenarios should consider the full spectrum of interactions between humans the natural environment, and should be supported by the sort of national strategic conversations exemplified in the UKNEA. Attempts to encourage such national conversations are being made by numerous groups around Australia, but they require stronger support from national leaders in governments, the economy and broader society to be effective.

## Conclusions, including suggestions from working groups

The section draws out key conclusions from the Forum, with special emphasis on the suggestions made by the working groups (see Appendix 3 for details of working group deliberations).

### Suggestions from working groups in summary

In the final session of the Forum, interested participants formed into working groups to consider key issues that had emerged during the day. The working groups delivered suggestions for improving Australia's ability to have cross-societal strategic conversations about the nation's future. Details are given in Appendix 3.

Key suggestions were:

- Develop frameworks and explanatory documents that engage with the concepts and disciplinary languages used by different government departments and sectors of society, to allow these departments/ sectors to talk productively with one another about cross-cutting social-ecological issues
- Enable and encourage networking among those interested in developing ecosystem services concepts further (using as far as possible some existing networks)
- Using the UKNEA as an example, consider what elements exist within Australia and what additional information, institutions, and other elements should be developed to enable a national strategic conversation about how future environmental and other resource management might affect human well-being and the status of other species.

### The importance of common language was recognised

The need for language that connects with multiple sectors has been recognised by environmental policy developers and decision-makers for over a decade in Australia, although combining language from different disciplines has often been a source of confusion and miscommunication.

The need for developing and using a common language emerged in various ways throughout the Forum, including:

- It was observed by international and Australian speakers that understanding of environmental issues is still very limited in some areas, apparently because most people (including bureaucrats)<sup>15</sup> have difficulty relating environmental concepts to their everyday lives

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<sup>15</sup> A government bureaucrat related a true story in which he was told by a central agency officer that he (the officer) did not “get the environment”. This officer likened the economy to the engine of a car and the upholstery to social issues, but suggested the environment was the “fluffy dice hanging from the



- The concept of ecosystem services has been successful in helping many people, in a variety of developed and undeveloped countries, understand the relationships between people and nature and engage in meaningful strategic dialogue about ways to balance social, economic and environmental policy and management, showing that common language can be very powerful
- Examples are emerging of how dialogue across environmental and economic sectors has revealed new economic opportunities (e.g., new markets for ecosystem services that help farmers in Australia and around the world make profits and serve society better, public-private investment in management of major environmental infrastructure such as the Great Barrier Reef and the Great Dividing Range in Australia, and the recognition in the UKNEA that ignoring the environment had led to lower returns on public and private investment).
- It was argued, notably by Simone Maynard, that an essential basis for common language is a national framework, including classification, information and tools (it was agreed that such a framework should be capable of flexible application for different purposes and some suggested that different frameworks might be required for different purposes).
- A simple message that does not compromise policy or scientific integrity is the aim (as recognised by the UKNEA and experiences in Australia).
- Development and application of common language won't eliminate the reality that viewpoints, interests, and access to information differ widely across society – but common language allows these differences to be explored constructively if people are willing.
- The UK and Australia have both experimented with government-community partnerships, which could be built on to facilitate national strategic thinking once common language is available.
- Confusion about the language of ecosystem services has often arisen from difficulties marrying this concept with existing ways of interpreting the significance of the environment – but the situation is improving as researchers and practitioners have focussed in the past decade on bringing the languages of economics, ecology, social science, and public administration together.
- Green infrastructure is an emerging concept connecting ecosystem services thinking with mainstream development thinking, which could be a focus for productive dialogue in the immediate future in Australia.
- Gaming and the use of social media are emerging as ways to engage current and future generations in understanding social-economic-environmental interconnections and experimenting with new policy possibilities

There is an appetite for developing some products, for use by governments and other sectors, that clarify and adapt language, concepts and frameworks from other parts of the world in the context of Australia's particular culture, environments and approaches to decision-making

The working groups broadly supported the need to develop products that clarify and explain the principles of ecosystem services thinking (noting that there was some difference of opinion about how

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rear-view mirror". This powerful story illustrates that much more work is required to explain the role of environmental processes in supporting Australia's society and economy.

prescriptive such products should be). It was recommended that one or more working groups be set up to develop these products through dialogue with stakeholders across government, and non-government sectors (noting that the process of developing a framework is as important, if not more important, than the results). These products should also include clarification of what tools are available for considering ecosystem services in decision-making (see later section on tools).

## There was support among many Forum participants for a national dialogue of the sort facilitated by the UKNEA

In dialogue throughout the day, and in the working group sessions in the afternoon, there was strong support for the sort of cross-sector strategic dialogue achieved by the UKNEA. It seemed to be broadly acknowledged that the political climate in Australia at present is not conducive to a process like the UKNEA and that, anyway, several of the elements of that process have already been completed or under development. It was agreed, however, that there is need to consider what existing networks can be used, or new ones created, to facilitate such dialogue.

In summary, there was a strong call from participants for some kind of forum, to allow those interested in exploring these issues to engage with one another cooperatively and collaboratively. The following are the key points from that small-group dialogue (see Appendix 3 for more detail):

- There's been a lot of progress on the science – a key remaining challenge is how to interpret and use that science in ways that it will engage the current government and they'll be willing to take it on.
- Asking what the environment can do for you may be a useful entry point for inviting government to see different ways of thinking, and firmly places the emphasis on the benefits of preserving ecosystems.
- It will be important to enable narratives that can be operational in the current political climate:

Note that another dialogue group concluded that the Ecosystem Services Partnership could be useful network to commence this dialogue.

## Immediate next steps

Several participants in the Forum suggested that a cross-sector working group should be established. This would bring together businesses, government and non-government organizations, researchers and others to encourage dialogue about how benefits from the environment can be integrated better into national policy and the thinking of political leaders. Australia21 is exploring how it might take a facilitation role in this regard, recognizing that several organizations are already making substantial progress.

# Appendix 1: Programme

**Table 3: Agenda**

Time	Activity	Speakers
0830-0900	Coffee and mixing	
0900-0920	Welcome	Paul Barratt AO, Chair Australia21 Mark Tucker, Deputy Secretary, Dept. of Agriculture
0920-0940	Setting the scene	Dr Steven Cork (Australia21, Ecoinsights, and Crawford School of Public Policy, ANU)
0940-1040	The UK National Ecosystem Assessment: Operationalising Ecosystem Service Thinking	Professor Roy Haines-Young (Nottingham University, UK)
1040-1100	<b>Morning tea</b>	
1100-1130	How the US, UK and Europe are applying ecosystem services thinking: lessons for Australia	Simone Maynard (SEQ Catchments and Australian National University)
1130-1230	Panel session and dialogue: What is Australia currently doing within the policy environment?	<ul style="list-style-type: none"> <li>• Dr Richard Mount (Bureau of Meteorology)</li> <li>• Bill Allen (Australian Bureau of Statistics)</li> <li>• Kimberly Green (Department of Agriculture)</li> <li>• Sean Sullivan (Department of the Environment)</li> </ul>
1230-1300	<b>Light lunch</b>	
1300-1345	How an ecosystem services framework has been, and could be, used for thinking about Australia's alternative futures	Professor Robert Costanza (Crawford School of Public Policy, ANU)
1345-1510	Panel session and dialogue: What could/ should Australia be doing?	<ul style="list-style-type: none"> <li>• Dr Daniel Connell (Crawford School, ANU)</li> <li>• Prof Robert Costanza (Ecosystem Services Partnership)</li> <li>• Dr John Williams (Wentworth Group)</li> <li>• Dr Paul Sinclair (Australian Conservation Foundation)</li> <li>• Sean Hoobin (WWF-Australia)</li> <li>• Deborah Kerr (National Farmers' Federation)</li> <li>• Sam Archer (Farmer and Nuffield Scholar)</li> </ul>
1510-1525	Summary of the day so far	Invited commentators
1525	<b>Afternoon tea and move to working groups (for those interested in staying)</b>	
1530-1630	Working group: Dialogue about key issues	Those who are interested in initiating collaborative projects/ working groups/ networks
1630-1640	Brief report back from discussion groups and conclusions	Brief summary of progress and further steps being contemplated
1640	End of forum	

## Potential questions for afternoon working groups

The final session of this Forum is an opportunity for participants to have targeted dialogue about key issues they identified throughout the day. The following are examples that emerged from Australia21's



Discussion Paper on Ecosystem Services (<http://www.daff.gov.au/natural-resources/ecosystem-services/ecosystem-services-report>) for the (then) Department of Agriculture, Fisheries and Forestry in 2012 (now the Department of Agriculture).

*Is something like the UK assessment warranted/ needed in Australia?*

In his keynote address, Professor Haines-Young reported on the UK's National Ecosystem Assessment (<http://uknea.unep-wcmc.org>) and how this has influenced policy and other decision-making in the UK. This raises questions for Australia, like:

- Might Australia benefit from a similar assessment now or at some point in the future?
- Who (individuals and/or organisations) might support such an approach and how?
- What challenges might need to be addressed?
- Would the approach used in the UK be suitable in Australia, or would modifications be required?

*Is there interest in creating a working group/ network to develop a common set of guidelines and language for use in government and between government and non-government agencies, business and the public?*

In its Discussion Paper, Australia21 recommended that a document, or documents, be produced to explain the concept of ecosystem services and to establish some common terminology that can be used, across government and between government and other sectors, to support strategic dialogue about interactions between the environment, the economy and society now and into the future.

- Is there support for such documents within government and/or beyond?
- Might the UK Government's publication called 'What Nature Can Do For You' (<http://archive.defra.gov.uk/environment/policy/natural-environ/documents/nature-do-for-you.pdf>) be a useful model?
- Is it feasible/ desirable to establish a government/ non-government working group?

*Is there interest in establishing a national ecosystem services network?*

In its Discussion Paper and previous dialogue (<http://shapingaustraliasfuture.blogspot.com.au/2012/05/new-national-network-for-ecosystems.html>), Australia21 has proposed a national ecosystem services network to allow interested people to share ideas about making this concept more useful for policy and other decisions.

Internationally, the Ecosystem Services Partnership (<http://www.es-partnership.org/esp>) has encouraged productive dialogue since 2008. Within Australia the National Plan for Environmental Information (<http://www.environment.gov.au/topics/science-and-research/national-plan-environmental-information>) and the Australian Bureau of Statistics (<http://www.abs.gov.au/ausstats/abs@.nsf/Products/4609.0.55.002~2012~Main+Features~Towards+Ecosystem+Accounting?OpenDocument>) have encouraged similar, but more limited, dialogue as have some non-government organisations, including ACF (<http://www.acfonline.org.au/be-informed/new-economics/valuing-environment>) and WWF (<http://www.sustainablemelbourne.com/events/business-biodiversity-and-ecosystem-services-valuing-the-earths-natural-capital-seminar/>).

- Are existing networks adequate or is something more needed?

*What can be done to improve the ways in which the environment is considered in national strategic conversations?*

Australia21's Discussion Paper emphasised that one of the most promising benefits of the concept and language of ecosystem services is to encourage and support more sophisticated strategic conversations about what sorts of future's Australia might have. Others, including Professor Costanza (ANU) and the Australian Academy of Science's Australia 2050 project (<http://www.science.org.au/policy/australia-2050/>), have made similar points. At present Australians have limited opportunities to engage in any sort of strategic conversations about the nation's possible futures, let alone the role of the environment in those conversations.

- What steps might be needed to improve this situation and how might we take the first steps?

## Appendix 2: Speaker biographies and abstracts

### Welcome and opening comments

*Paul Barratt AO, Chair Australia21*

*Paul Barratt has had over 40 years' experience of policy advising and international negotiations in the areas of defence, foreign relations, international trade and climate change. After completing an honours degree in physics he joined the Department of Defence as a scientific intelligence analyst. He undertook an intensive course at the Australian School of Nuclear Science and Engineering and completed a second degree, in economics and Asian Civilisations. He has been Secretary to the Department of Defence, Secretary to the Federal Department responsible for mining, oil & gas, agriculture, forestry and fisheries, Deputy Secretary of the Foreign Affairs Department and of the Trade Department, Special Trade Representative for North Asia, and Executive Director of Australia's leading business roundtable. He is now an independent consultant, and a director of Australia 21 Limited.*

*Mark Tucker, Deputy Secretary, Department of Agriculture*

*Mark Tucker has been a deputy secretary in the Department of Agriculture since February 2012. Mark is responsible for areas related to agriculture, fisheries and forestry production. As Chief Operating Officer he also oversees several areas of the department's corporate and governance responsibilities.*

*Current areas of priority include: drought reform; Agvet chemical reform; fisheries and forestry policy; natural resource management and climate change related to agriculture; and ongoing improvement of several corporate functions. Mark is the department's Indigenous Champion and Security Executive.*

*Mark has worked in the departments of the Prime Minister and Cabinet; Primary Industries and Energy; Communications, Information Technology and the Arts; and Sustainability, Environment, Water, Population and Communities.*

*During his career, Mark has been responsible for a wide range of public policy issues particularly in the environment, natural resource management, arts, heritage and indigenous conservation fields. He oversaw the merger of Australia's three major film bodies into Screen Australia, and for a period acted as Chief Executive Officer at the Australian Film and Sound Archive.*

*Mark is currently a board member of the Bundanon Trust, and prior to this was a board member for the National Portrait Gallery. Mark completed his Bachelor of Science majoring in Zoology and an Honours degree based on a thesis covering Antarctic marine systems.*

## Considering the environment in national strategic thinking: Setting the scene

*Dr Steven Cork, Australia21, Ecoinsights, and the Crawford School of Public Policy, ANU*

In 2011, the then Department of Agriculture, Fisheries and Forestry commissioned Australia21 to prepare a report on the concept of ecosystem services: how it has evolved over the past decade and how it has been, and could be, applied in policy. The report concluded that the naming and explaining of the benefits that people receive from the environment, which are at the heart of ecosystem services approaches, are among the most powerful contributions of this concept to society. The report argued that tackling many of the complex, ‘wicked’, problems that face Australia already, and will likely become bigger challenges in the future, requires dialogue across government and between government and the rest of society to both reach common understanding of the nature of the issues and build acceptance of the processes proposed for dealing with them. The concept of ecosystem services is one approach that has provided frameworks and language aimed at facilitating cross-society dialogue about interactions between humans and the environment.

Policy issues that could benefit from a more strategic, whole of government and society approach include: population; food security; water management; energy supply; mental and physical health; biosecurity; and even national security. Increasingly, there are calls to consider the role of the environment, along with other factors, in maintaining human well-being, now and into the future, and using well-being as a measure of national progress. Steps in this direction are being taken by agencies such as the Department of the Environment, the Bureau of Meteorology and the Australian Bureau of Statistics and by several non-government organisations represented in this forum.

At a technical level, the language and frameworks for ecosystem services are not perfect, but major progress has been made in the past 16 years on many fronts, including: consistency of definitions and typologies; linking ecological and social concepts with economics; assessing supply of and demand for environmental benefits; and considering the effects of land management practices on multiple ecological processes and their integrated outcomes at a range of spatial scales.

While further progress is needed in these areas, the report suggests that the major constraints on making better use of the concept of ecosystem services are institutional. For example: governments continue to consider that the environment is the domain of only one department; there are few mechanisms for cross-government or cross-society strategic dialogue about how environmental management might affect multiple portfolios, economic sectors and parts of society; and there is a pervading assumption that improving environmental management involves tradeoffs with social and economic progress.

But do we expect too much of government? Should we look to other formal and informal institutions to take a greater role in generating strategic dialogue? Are we already seeing this wider involvement emerging and can governments help by removing disincentives?

The Australia21 report made four high-level recommendations:

- 1: Develop a process for strategic dialogue and planning within the Australian Government that considers the full range of potential benefits from ecosystems along with other information relevant to strategic decisions.

- 2: Explore improvements to governance arrangements to encourage appropriate sharing of responsibility for strategic alignment of human well-being and ecosystem management across society
- 3: To support all of the above, continue and enhance initiatives to establish an appropriate and accessible set of information capable of supporting strategic dialogue about ecosystem management and human well-being
- 4: Build on and enhance Australia's investments in innovative ways to link ecological and economic research with business to drive desirable environmental change

Speakers and other participants in this forum are encouraged to consider the conclusions of the Australia21 report, but not necessarily agree. In today's forum we aim for constructive sharing of ideas about: how Australia might achieve better strategic thinking about its possible futures; how the environment might be better considered in that thinking; how progress can be made towards common language and concepts that facilitate two-way communication across disciplines, sectors and communities; and, ultimately, how all of this can be turned into better policies and decisions.

To shine a light on these and other questions, we are privileged to have Professor Roy Haines-Young as a keynote speaker, who will reflect on the outcomes of the UK's National Ecosystem Assessment, and Simone Maynard, who has recently completed an investigation of approaches to operationalising ecosystem services in the UK and the USA. Other speakers, led off by Professor Robert Costanza, will start some dialogue about what Australia could or should do in the future. The final session will give workshop participants the opportunity to start talking about next steps, including possible working groups and/or collaborative initiatives.

*Steven Cork is an ecologist and futurist. As an ecologist he spent 25 years in CSIRO researching the interactions between humans and the natural environment around the world. As a futurist he played a leading role in developing scenarios for the World's social-ecological futures for the United Nations' Millennium Ecosystem Assessment and has run similar projects with government and non-government groups around Australia. He has worked extensively as an advisor to governments on policy issues and as a government employee developing and implementing environmental policy. He now works privately as a futurist, strategist and ecological advisor as the Principal Consultant of EcoInsights and leads a project on the resilience of Australia in the private sustainability R&D organisation Australia21. He is also Director of Australia21. As an Associate of Interaction Consulting he facilitates workshops on strategic thinking for public servants. He is an Adjunct Professor in the Crawford School of Public Policy at the Australian National University. He was Deputy Chair of the committee that prepared the 2011 National State of the Environment Report.*

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## The UK National Ecosystem Assessment: Operationalising Ecosystem Service Thinking

*Professor Roy Haines-Young, Centre for Environmental Management, School of Geography, University of Nottingham, UK.  
Email: [Roy.Haines-Young@Nottingham.ac.uk](mailto:Roy.Haines-Young@Nottingham.ac.uk)*

The UK National Ecosystem Assessment (UK NEA) is an interesting case study for anyone interested in making ecosystem service concepts count in the policy and planning arenas. The initiative started in 2009, and following a major report from the initial phase of analysis in 2011, a second tranche of work has been funded that will deliver its results early in 2014. What is interesting in this follow-on phase is that the emphasis has shifted from establishing the 'basic science' and the 'base-line' for our ecosystem services, to operationalising the data and concepts in planning and policy. In this talk I will trace the evolution of this thinking and describe some of the key features of the most recent stages of the work, with a view to better understanding what is needed to use the outputs from the assessment.

The overall goal of the NEA and associated work is to try to embed the ecosystem approach and concepts such as ecosystem services and natural capital in decision making. What seems clear from the UK experience is that while support and leadership from central Government is essential, considerable effort needs to go into building capacity in the communities that make decisions about ecosystem services at local levels. Moreover, institutional and regulatory frameworks also need to change if we are to successfully embed ecosystem service thinking in what people do and how they plan. Key issues will be explored and illustrated by reviewing the kinds of work being done at national level through the newly established Natural Capital Committee and business networks, and at more local scales through such initiatives as biodiversity offsetting and local nature partnerships.

*Roy is Professor in Environmental Management and Director of the Centre for Environmental Management (CEM) in the School of Geography, University of Nottingham. His research interests focus on Ecosystem Accounting, land cover/use change, natural capital, biodiversity, resilience, ecosystem services, scenarios, modelling tools, e.g. Bayesian Belief Networks. Although trained as a natural scientist, he has sought to develop a stronger social content in his recent work. He has worked extensively with the policy makers in Central Government and its agencies, and recognises the need to develop a science that is responsive to the wider public debates about environmental issues. He is an adviser for environmental issues to research councils, but also Governmental Agencies. He is a co-author of the conceptual chapter of the TEEB report, lead author of the UK NEA scenario chapter and on the Expert Panel for the overall UK National Ecosystem Assessment. He is a founding member of the Ecosystem Service Partnership.*

*More information on: <http://www.nottingham.ac.uk/CEM/Haines-Young.html>*

## How the US, UK and Europe are applying ecosystem services thinking: lessons learnt for Australia

*Simone Maynard, South East Queensland Catchments and Australian National University*

In the opening address of the 10th Conference of the Parties to the Convention on Biological Diversity the Executive Secretary asked us to apologise to our children for our failure to meet the agreed 2010 targets and reduce the loss of biodiversity. The Millennium Ecosystem Assessment, the most comprehensive global assessment of ecosystem services conducted to date, identified nineteen of the twenty four ecosystem services assessed were in decline. It is now clear the business-as-usual approach to environmental management is unsustainable with population growth, associated resource consumption and land conversion placing significant pressures on the capacity of ecosystems to continue to support biodiversity and provide the life-supporting goods and services on which human well-being depends (e.g. clean air and water, buffering against extreme events, providing food and



timber, generating spiritual values - to name a few). The two fundamental changes that need to occur to improve environmental management (and hence the well-being of people) are the need to rapidly advance information and tools to forecast and quantify ecosystem service provision; and ecosystem services need to be explicitly and systematically incorporated into decision making by all sectors of society (e.g. business, industry, community, government, non-government and researchers). Globally, much has been achieved in terms of defining, classifying, measuring and valuing ecosystem services. The importance of ecosystem services to sustainable development and the well-being of people has been recognised and endorsed by world leaders, and emphasised in many international policies and programs including the World Commission on Environment and Development, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services and the UN Statistical Division through the revision of the System of Environmental-Economic Accounts. Slowly, attention has turned from the global scale to national scale ecosystem service frameworks, assessments and programs, for example in the US, UK and across Europe. The term 'ecosystem services' now also appears in many key documents across the environment and agricultural portfolios of the Australian Government and the states of Australia. To date however, information has not been collated, adopted or developed to incorporate ecosystem services into any of these programs. By sharing and comparing approaches to ecosystem services in the US, UK and across Europe, this presentation will argue the need for a national ecosystem services assessment methodology for Australia. The development of such a framework would enable a consistent approach to ecosystem service assessments across stakeholders, enabling the operationalisation of a concept that to date that has been limited in its application as a proactive tool to natural resource management in Australia.

*Simone is currently Ecosystem Services Manager at SEQ Catchments, the Regional Body managing natural resources in South East Queensland (SEQ). She is also a PhD Scholar at the Fenner School at ANU studying multi-scale frameworks for ecosystem service assessments. Although Simone is trained in environmental science (specifically, ecology and conservation biology), after nearly a decade of coordinating and facilitating multi-disciplinary working groups she calls herself a 'Specialist Generalist'. Simone works at the interface between government, industry, business, researchers and the community to develop and apply ecosystem service approaches at multiple scales. Simone has received numerous academic awards, scholarships and travel grants. In 2008 the SEQ Ecosystem Services Project which Simone manages, won a Planning Institute of Australia Award for Excellence.*

*In 2009 Simone was invited to become an Australia 21 Scholar. In 2011 Simone was invited to Parliament House to address the Prime Minister and federal Ministers on 'An ecosystem services approach to sustaining Australia'. Simone is on the Editorial Board for the Journal 'Ecosystem Services' and a Member of the IUCN Commission on Ecosystem Management. She is also Chair of the Australian Network and Oceania Regional Chapter of the Ecosystem Services Partnership (ESP); and chairs the Regional Chapters and National Networks for the ESP. Simone has sat on numerous programme Steering Committees, Expert Panels and completed reports and contracts for government and non-government agencies and consortiums in Australia and globally. Simone was a contributing Author on The Economics of Ecosystems and Biodiversity (TEEB) and contributes to the United Nation's revision of the System of Environmental-Economic Accounts (SEEA) through the Australian Government community of practice on national environmental accounting.*

## PANEL SESSION 1: What is Australia currently doing within the policy environment?

*Environmental Accounting from the perspective of the Bureau of Meteorology (from: 'Progress towards the development of a national plan for environmental information')*

*Dr Richard Mount, Bureau of Meteorology*

The Bureau of Meteorology has a new dedicated *Environmental Accounting Function*, which, as part of its contribution to the *National Plan for Environmental Information*, has developed a *Guide to Environmental Accounting in Australia*, and is initiating the production of environmental accounts. The ongoing development of the accounting function and the *Guide* is deeply influenced by the policy environment in Australia and draws on major international stands of work and thought including ecosystem services. The positioning of the Bureau environmental accounting activity also reflects the culture of the Bureau and has strong cooperative and interdisciplinary characteristics. The idea of translation across domain boundaries is an important touchstone for the activity. For example, while environmental accounting uses the language and concepts of business and economics, the Bureau activity also needs to speak to those with a conservation and resource management orientation. The speaker will present a brief summary of the resulting shape of the Bureau environmental accounting activity and a perspective on some of the linkages and role of this work, now and into the future.

### KEY POINTS:

- The *System of Environmental-Economic Accounts (SEEA)* includes ecosystem services and provides flexible and powerful pathways to account for the environment and ecosystems in non-monetary terms without requiring a reference to the economic system or monetary valuation. This opens the way to accounting for ecosystems from an entirely environmental perspective and for a range of non-monetary values. While such accounts are valuable for many purposes, the SEEA framework provides the added advantage of enabling strong links to the economic system, most powerfully through its inherent spatial structure.
- A range of complex challenges could benefit from an environmental accounting approach, including those related to social and economic issues. Benefits flow from improved information exchange leading to increased understanding, reduced risk and increased trust and confidence. This generally leads to increased accountability, reduced costs and increased investment in environmental management activities.

For more details, please see the *Environmental Accounts Landscape* review paper and the *Guide to Environmental Accounting in Australia* (due to be launched 11th December 2013) at <http://www.bom.gov.au/environment/activities/accounts.shtml>

*Dr Richard Mount is currently the Environmental Accounts Lead at the Bureau of Meteorology where he is responsible for the development of an Environmental Accounting Platform as part of the National Plan for Environmental Information. He was responsible for producing the Guide to Environmental Accounting in Australia, a major Australian Government publication introducing environmental accounting concepts, principles and practice for a wide range of policy-makers and practitioners. He is a member of the Wentworth Group of Concerned Scientist's NRM Environmental Accounting Trial*



## Considering the environment in national strategic thinking

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*Scientific Accreditation Committee and a member of the UN Statistics Division Expert Group on Ecosystem Accounting. Richard is a geographer and spatial scientist with a background in environmental information and reporting systems.*

### Australian Environmental-Economic Accounts

*Bill Allen, Australian Bureau of Statistics*

The ABS produces a number of environmental-economic accounts which can provide insight into the interactions between the economy and the environment, as well as describe stocks and changes in stocks of environmental assets. The challenge for ABS, and other producers of environmental accounts, is to engage with potential users of the accounts to better tease out those areas where the accounts can add further value.

*Bill heads the Environment Statistics and Integration Branch which is responsible for researching into and producing environmental-economic accounts, as well as driving the effective use of taxation data in the ABS and the integration of ABS economic and environment statistics through the use of common statistical infrastructure, processes and standards. While Bill's recent experience has been with economic statistics, he has spent much of his career as a statistical methodologist at the ABS advising on survey design, estimation and analysis. Bill has an active interest in driving the effective use of statistics and understanding data quality, having introduced the ABS Data Quality Framework. He also has experience in the market research sector, primarily with the public sector, having headed the Canberra Office for ACNielsen.*

### Department of Agriculture

*Kimberly Green, Department of Agriculture*

*Kimberly Green is currently the Acting Assistant Secretary, Sustainable Agriculture and Engagement Branch in the Sustainable Resource Management Division of the Department of Agriculture. Kimberly has been with the Department for 7 years, predominantly in Sustainable Agriculture policy but also contributing to the development of the National Food Plan white paper. She has been working in agriculture for over 20 years and is still associated with the family farm in Beachport, South Australia. Kimberly commenced with the state government as a horticulture inspector, extension officer and conducting research trials in the south-east of South Australia. Kimberly then moved to Adelaide, still with the state government, to establish the state's first co-regulatory system for plant health and worked in plant health and biosecurity policy. In 2005 Kimberly joined Plant Health Australia to develop Australia's first National Fruit Fly Strategy with government and industry with Professor Mal Nairn. Kimberly then joined the Department of Agriculture in 2006 in the Research and Information section of Sustainable Resource Management Division, and then as the Director, Sustainable Agriculture Policy.*

### Department of the Environment

*Sean Sullivan, First Assistant Secretary, Biodiversity and Conservation Division, Department of Environment*

*Mr Sullivan's responsibilities as First Assistant Secretary of the Biodiversity and Conservation Division focus on the delivery of key government biodiversity policy and programs. Sean has been in the portfolio for 18 years and prior to this, he worked in the Department of Primary Industries and Energy. During*

his time in the Environment portfolio he has worked on a variety of natural resource management issues including the regional forest agreement process, the establishment of the Australian Greenhouse office and the implementation of Australia's Oceans Policy in the National Oceans Office. Prior to his current position, Sean was in charge of the Policy and Communications Division. Before joining the Australian Public Service, Sean spent ten years at the Australian National University in undergraduate, postgraduate and research positions in science, ecology and environmental law.

## How an ecosystem services framework has been, and could be, used for thinking about Australia's alternative futures

Professor Robert Costanza, Crawford School of Public Policy, ANU

*Dr. Robert Costanza is a Chair in Public Policy at Crawford School of Public Policy. Prior to this, he was Distinguished University Professor of Sustainability, in the Institute for Sustainable Solutions at Portland State University. Before moving to PSU in Sept. 2010, he was the Gund Professor of Ecological Economics and founding director of the Gund Institute for Ecological Economics at the University of Vermont. Before Vermont, he was on the faculty at Maryland and LSU, a visiting scientist at the Beijer Institute in Sweden, and at the Illinois Natural History Survey. Dr. Costanza is also currently a Senior Fellow at the National Council on Science and the Environment, Washington, DC, and a Senior Fellow at the Stockholm Resilience Center, Stockholm, Sweden, and an Affiliate Fellow at the Gund Institute for Ecological Economics at the University of Vermont*

*Dr. Costanza received BA and MA degrees in Architecture and a Ph.D. in Environmental Engineering Sciences (Systems Ecology with Economics minor) all from the University of Florida.*

*Dr. Costanza's transdisciplinary research integrates the study of humans and the rest of nature to address research, policy and management issues at multiple time and space scales, from small watersheds to the global system. Dr. Costanza is co-founder and past-president of the International Society for Ecological Economics, and was chief editor of the society's journal, Ecological Economics from its inception in 1989 until 2002. He is founding co-editor (with Karin Limburg and Ida Kubiszewski) of Reviews in Ecological Economics. He currently serves on the editorial board of ten other international academic journals. He is also founding editor in chief of Solutions ([www.thesolutionsjournal.org](http://www.thesolutionsjournal.org)) a unique hybrid academic/popular journal.*

*His awards include a Kellogg National Fellowship, the Society for Conservation Biology Distinguished Achievement Award, a Pew Scholarship in Conservation and the Environment, the Kenneth Boulding Memorial Award for Outstanding Contributions in Ecological Economics, and honorary doctorates from Stockholm University and the Ecole Normale Supérieure de Lyon.*

*Dr. Costanza is the author or co-author of over 500 scientific papers and 23 books. His work has been cited in more than 11,000 scientific articles and he has been named as one of ISI's Highly Cited Researchers since 2004. More than 200 interviews and reports on his work have appeared in various popular media.*

*His specialties include: transdisciplinary integration, systems ecology, ecological economics, landscape ecology, ecological modeling, ecological design, energy analysis, environmental policy, social traps, incentive structures and institutions*

## PANEL SESSION 2: What could/ should Australia be doing?

### *Time to Regroup and Reassess?*

*Dr Daniel Connell, Crawford School of Public Policy, ANU*

The first IPCC report in 1990 and the Rio Earth Summit in 1992 stimulated extraordinary creativity and optimism in response to the growing global environmental crisis. Since the 1990s, however, government responses world-wide measured against their own commitments, have been abysmal. There also seems to have been an intellectual retreat. Internationally the concept of sustainability based on an ecosystems perspective, has been pushed aside by a focus on water security and the nexus between water, food and energy, reflecting a return to the narrow resource development priorities of earlier times. Similarly within Australia in the Murray-Darling Basin we now aim to protect environmental assets rather than restore ecosystem functions. Are these arguments fair? If so, have the conceptual underpinnings for policies promoting ecosystem services been eroded?

*Dr Daniel Connell works in the Crawford School of Public Policy in the Australian National University where he teaches courses dealing with environmental policy and trans-boundary hydrological systems. His publications include Water Politics in the Murray-Darling Basin published in 2007 and Basin Futures co-edited with Quentin Grafton and published in 2011. His current research focusses on issues related to institutional design and the governance of rivers in federal or multi-layered political systems such as Australia, South Africa, United States, Mexico, European Union (Spain), India, China and Brazil.*

### *A Perspective from a Founding Member of The Wentworth Group of Concerned Scientists*

*Dr John Williams FTSE, Wentworth Group of Concerned Scientists*

#### **Some background**

In 1911, John Muir observed... 'When we try to pick out anything by itself in nature, we find it hitched to everything else in the Universe.'

The world has a huge appetite for energy, water and food. The ecosystems and the natural resource base that provide all three are woven together and linked in a way that means we cannot manage one without impacting on at least one of the others. Energy, water and food each operate as threads in the fabric of life on this finite planet.

While water can be seen as the gossamer that links together the web of food, energy, climate, economic growth and human well-being, energy and the capture of carbon in food production are similarly important.

All three are strongly interdependent.

Can you see how the threads of the cloth are hitched to other threads in the fabric of our civilization? In past times we could pull threads and it did not seem to matter. Now it does. We have lived as if our planet is infinite and now we see that it is finite and for the first time we see our impact on the properties and function of the Planet Earth.

Our frame of thinking has to change.

The two centuries since the start of the industrial era has been a period of rapid and almost unbroken economic growth in much of the world, based upon exponentially increasing the use of energy and water resources and the atmospheric commons.

It is axiomatic that exponential growth cannot continue forever on a finite planet, leading to an emerging collision between the presently irresistible force of economic growth and the immovable reality of the finitude of Planet Earth.

This collision takes many forms and will occur over many decades, but its effects on water resources and climate are already plainly evident. The inevitability of the collision has led to a contest between two broad narratives about energy, water and climate in the 21st century - one framed around the paramount need for economic growth and the other around the paramount need to protect an increasingly fragile natural world.

Many features of recent public discourse (including the acceleration of the news cycle and the echo-chamber effect of interactive social media) have driven these narratives to become progressively more mutually antagonistic and incompatible.

- The future therefore depends upon the evolution of more subtle and resilient narratives about human-earth interactions, in which energy, water and climate are central.
- The evolutionary fitness test for these narratives is to empower a transition to a society that lives within the means of a finite planet and improves global well-being at the same time.

In summary then the bottom line is that we must change our incompatible stories about energy, water, food and climate. We cannot continue to foster one story that assumes an infinite planet and is framed around the paramount need for economic growth while maintaining the other story around the paramount need to protect an increasingly fragile natural world.

The future therefore depends upon the evolution of a more subtle and resilient story about human-earth interactions, in which energy, water and climate are central and where a new story evolves to empower a transition to a society that lives within the means of a finite planet and improves global well-being at the same time.

To take our first steps on this journey we in Wentworth Group see the following strategies important in Australia.

- Land-use planning and environmental regulation to maintain a healthy environment and to promote development.
- Strengthening regional natural resource management authorities.
- Building a system of National Environmental Accounts to inform investment and policy decisions.
- Securing Australia's conservation estate and taking effective action to protect threatened species.

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*John is a founding member of the Wentworth Group of Concerned Scientists, a Fellow of the Australian Academy of Technological Sciences and Engineering and holds the prestigious Farrer Memorial Medal for achievement and excellence in agricultural science. He is one of Australia's most respected and trusted scientists, with extensive experience in providing national and international thought-leadership in natural-resource management, particularly in agricultural production and its environmental impact.*

*John retired recently after nearly six years as Commissioner of the NSW Natural Resources Commission (NRC). He was former Chief Scientist, NSW Department of Natural Resources following his retirement from CSIRO as Chief of Land and Water in 2004. John is currently Adjunct Professor in Public Policy and Environmental Management at the Crawford School of the Australian National University and Adjunct Professor, Agriculture and Natural Resource Management, Institute Water, Land and Society, Charles Sturt University. He is also Director of John Williams Scientific Services Pty Ltd, which provides strategic advice and analysis in Agriculture and the Natural Resource Sciences.*

### A perspective from the Australian Conservation Foundation

*Dr Paul Sinclair, Australian Conservation Foundation*

Global demand for Australia's natural resources will drive pressure to dig, drill and clear beyond what have been the natural or legal limits of past exploitation. At the same time, every major national indicator of environmental health shows the nations soils, water, vegetation and biodiversity are seriously degraded or under threat.

Australia needs to consider it's natural wealth as a form of 'green infrastructure', just as - or often even more vital - to the well-being of Australians the existence of reliable telecommunications, efficient public transport, a high-speed rail network or networks of cycle paths.

'Business as usual' has meant ignoring green infrastructure and assuming it will always be able to provide whatever environmental services communities, or global markets demand. Instead, the Australian Government should make investment in the protection, restoration and management of green infrastructure a key pillar in its national agenda.

*Dr Paul Sinclair is the Director of Environmental Campaigns at the Australian Conservation Foundation and responsible for developing and managing campaign teams who build community, business and government support for initiatives that conserve and restore Australia's safe climate and ecosystems.*

### Making environment protection an economic priority

*Sean Hoobin, Policy Manager Freshwater WWF-Australia*

Tight government budgets are making the task of getting increased investment in environmental programs even more challenging. To secure funding strong arguments need to be made demonstrating that environmental investments will also bring economic returns. WWF-Australia is applying this approach in its campaign to boost the resilience of the Great Barrier Reef:



- With Great Barrier Reef tourism contributing \$6 billion and supporting 65 000 jobs the benefits of investing in a healthy Reef are easily demonstrated
- The solution to one of the key impacts on the Reef, agricultural pollution, is to assist farmers implement new practices, which not only cut pollution but also improve farm profitability.

Despite the clear economic benefits of such an approach there is simply not the scale of investment necessary to bring the transformational change needed to save the Reef. Prior to the election WWF-Australia released a discussion paper on a Reef Bank – a fund built from various income sources which could be invested in both commercial and public good actions to benefit Reef health. This idea has been taken up, in part, with the Australian Government’s announcement to establish a Reef Trust, which will combine government and private funds to improve coastal habitat and water quality along the Great Barrier Reef. Such a fund could become a model for investment in environmental programs but has some establishment challenges:

- Identifying a range of viable income streams
- Identifying commercial and semi-commercial projects which will allow the building of funds
- Investment plans which ensure that funding is directed to the most cost-effective actions for Reef health
- Planning, assessment and offsets arrangements have integrity so that the Reef Trust is not seen as a means to facilitate damaging developments

*Sean has over twenty years’ professional experience in environment management, with ten years specialising in water management. His current focus is the protection, management and rehabilitation the Great Barrier Reef and its catchments - and in particular building finance streams to invest in actions to cut Reef pollution and build Reef resilience. WWF has 5000 staff in over 100 countries, backed up by 5 million supporters. They work on-ground as well as at the national and international level to develop solutions so people can live in harmony with nature.*

### A perspective from the National Farmer's Federation

Deborah Kerr, National Farmers’ Federation

*Deb Kerr joined the NFF as Manager, Natural Resource Manager in April 2008, bringing a wealth of experience to the water portfolio having covered regional, state, federal and Murray-Darling Basin jurisdictions.*

*In addition to water-related issues including the Murray Darling Basin Plan and the National Water Initiative, Deb’s policy portfolio covers a wide range of other land use areas including climate change, carbon tax, the Carbon Farming Initiative, property rights, mining and coal seam gas and the EPBC Act. Deb is frequently engaged to collaborate with the Commonwealth Government, COAG processes and private sector industry bodies to represent the agricultural sector in land use policy formulation.*

*Previously Deb has held policy positions covering water, farm business and economics, trade and membership for farm representative bodies. She managed Australia’s first on-farm water efficiency project, under The Living Murray Initiative. She has held positions on the State Water Murray Lower Darling Customer Service Committee and the Murray Catchment Management Authority Barmah Millewa Forest Community Reference Group.*



*Deb holds a Bachelor of Management degree from the University of Sydney, a Diploma from the Australian Institute of Company Directors, and is a graduate of the AICD and Murray-Darling Basin Leadership Program.*

### *A farmer's perspective*

*Sam Archer, Farmer and Nuffield Scholar*

The world's ecosystems face competing demands from agriculture, mining, forestry and urban development. Forecasts indicate the world's population will increase 50% by 2050 and food demand will double in the next 50 years. These influences will place increasing pressure on the ability of ecosystems to provide vital environmental goods and services, including food and fibre production. A balance, however, is required between food security, climate change initiatives and ecosystem preservation.

The world's farmers have the greatest capacity to protect and enhance the world's ecosystems. They manage 60% of the world's productive landmass and 70% of its freshwater and have already developed numerous innovative ecosystem service schemes.

Despite Australian Governments, both State and Federal, embarking on a number of pilot environmental stewardship schemes, these nascent programmes and the institutions that support them have repeatedly suffered at the hands of capricious Governments. Consequently, there has been a loss of continuity, market confidence, stakeholder engagement, corporate knowledge and national oversight of the collective work that has been, and is being, undertaken.

The Australian Government clearly does not have the resources to fully fund a national stewardship scheme. It should, therefore, provide enabling legislation, allow a non-government organisation to administer the scheme and the private sector to develop and drive the market place. This would enable ecosystem management to move beyond the current piece meal approach, fund initiatives beyond traditional three-year cycles and address the issue of ecosystems and their services crossing spatial boundaries.

Central to this is a National Ecosystem Services Scheme (ESS) encompassing a private sector funded / consumer pays, whole-of-landscape approach as a cornerstone of a national climate change initiative. It would be voluntary, implemented on marginally productive land, and paid as a performance-based, annual cashflow stream utilising a range of Market Based Instruments (MBIs).

Farmers would be encouraged to identify their least productive land which might be a combination of, but not limited to; riparian zones, acidic or saline soils, remnant vegetation, water logged areas, wind swept ridge lines, highly eroded or degraded sites. They would manage these marginal areas to deliver ecological goods and services, be they carbon, water, biodiversity or soil related.

These environmental 'credits' would entitle the farmer to an annual cashflow stream, provided they continued to deliver the environmental benefits to a standard of peer reviewed industry best management practice which were over and above the farmer's environmental duty-of-care.

*Sam and his family farm in the foothills of the Snowy Mountains, producing meat, wool and ecosystem services in southern NSW. He has worked with the farming sector, indigenous groups and corporate entities on strategy, governance and sustainability initiatives for the past 25 years. He is Chair of the*

## Considering the environment in national strategic thinking

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*Local Land Services (Riverina), a non-Executive Director of the Rural Industries Research and Development Corporation and Farm Apps. He is formerly a member of the Australian Farm Institute's Research Advisory Committee, Senior Vice President at NSW Farmers Association, Chair of Murrumbidgee Landcare and member of the National Farmers' Federation Economics, Trade and Sustainability Committees. In 2008 he was awarded an Australian Nuffield Farming Scholarship and travelled throughout the Americas, Europe and India researching private sector/consumer funded environmental stewardship schemes broadly based around carbon, water and biodiversity.*

## Appendix 3: Reports from working groups

### Issues identified by the participants after hearing the speakers

The working groups organised themselves around the following topics, drawing on, but re-organising, the questions posed in the programme (see Appendix 1):

- Is something like the UK assessment warranted/ needed in Australia?
- Is there interest in creating a working group/ network to develop a common set of guidelines and language for use in government and between government and non-government agencies, business and the public? How can we best communicate with central government departments?
- Is there interest in, and/or a need for, establishing a national ecosystem services network? What can be done to improve the ways in which the environment is considered in national strategic conversations?
- How can we take account of tradeoffs between ecosystem services that result from policy and/or management decisions?

### Notes from small-group dialogues

#### *Is something like the UK assessment warranted/ needed in Australia?*

(Note that this was a small group of 4 people, one of whom was Roy Haines-Young)

Is the 5kg UK NEA report actually valuable?

- The networking aspect was valuable/ an asset
- Report itself was patchy

Was it too ambitious?

- No, not ambitious enough. There was no new research commissioned to join 'silos' of knowledge. Need to fill existing gaps.
- - There are very few biophysical scientists involved in the second stage. It's been 'dumbed down.'

How was the data compiled?

- Looked at post-war (1970s onwards) time series data.
- Looked backwards and projected forwards, and in a spatially explicit way.
- No new data was collected

Accounting and the NEA

- The NEA was a one-off.
- Not going to be done again anytime soon.
- But, this will create a framework for the future.
- What will be really important is learning how to use the framework and use the accounts.
- Suggest a targeted accounting initiative focusing on key infrastructure

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- Need properly institutionalised accounting
- Integration lacking, missing.

### NEA focus

- Unfortunate that 90% was focused on ecology
- Need to interest other sectors of industry/society and bring in social and economic aspects and values.

### How were ecosystem values captured?

- Mostly land cover data was used
- 20-25 categories of land cover was integrated with agricultural use
- Each 2 km square was estimated for its agricultural output.

### Next Phase of NEA

- Will be more integrated with complex models

### How were ecological limits/thresholds/accounted for in the NEA?

- DEFRA set up a National Capital Committee - uses a traffic light system for 'asset checks' (Red, Amber, Green)
- Difficult to capture national/community/social/environmental values/needs in thresholds.
- Depends on politics, scale, political cycle etc.

### How were non-market goods valued?

- Mostly Travel-Cost and Hedonic
- No Choice Modeling, Contingent Valuation

### Which aspects were modelled?

- Agricultural production (livestock, machinery, fertiliser use)
- GHG Emissions
- Recreation values (Travel Cost)
- Green Spaces (Hedonic) - looked at farmland bird biodiversity as this was the only ecological indicator available.

### Methods are not very solid

- not enough data - but it did get published in *Science*!

### Policy Impact?

- Can't pinpoint any discrete policy impacts
- But the same officials who oversaw the NEA also oversaw the White Paper - and there was probably cross-pollination of ideas between the two, and especially in the 'Nature at Work' scenario in the White Paper.

### Conclusion: Is a NEA needed/ feasible in Australia?

- Probably a full-scale bells & whistles NEA is not needed in Australia - focus on valued assets
- Should focus on strategic assessments

*Is there interest in creating a working group/ network to develop a common set of guidelines and language for use in government and between government and non-government agencies, business and the public? How can we best communicate with central government departments?*

- There is a continuing need to better communicate the concepts of ecosystem services with governments and society
- Institutions over the past decade and more have not had a lot of success
- There would be great value in a network that could share information and ideas
- There was lack of agreement about whether a new network is needed – the international Ecosystem Service Partnership could provide much of what is needed, if membership rules can be modified appropriately and a local (Oceania? Australia-New Zealand?) group could be established and energised
- Whatever network is used, it should include a wider range of institutions and organisations (e.g., health, mining, forestry)
- Some prefer a formal network, others an informal one – probably we need a mix of both
- Networks like Rural Fire Service volunteers give examples of structures that might work
- There seems to be strong interest in exploring this issue further – funding will be a key issue whichever approach is taken
- There was much debate at the meeting about whether an Australia-specific framework for ecosystem services is required. Some argued that frameworks exist, so why develop another one? Others pointed out that there are so many frameworks that interested decision makers don't know where to turn. This issue deserves further discussion – perhaps what is most needed is a distillation of principles gleaned from existing frameworks and some analysis of what core messages and structures should be taken for Australia from these existing frameworks? The A21 report for DAFF addressed this issue and should be a good place to start.
- The CICES framework (being developed for the System of Environmental-Economic Accounts internationally) was suggested as a useful framework, but its authors, Roy Haines-Young argued that it is not designed for this purpose – we should explore this comment further and be clear about what is needed for Australia and how that relates to CICES

*Is there interest in, and/or a need for, establishing a national ecosystem services network? What can be done to improve the ways in which the environment is considered in national strategic conversations?*

- There's been a lot of progress on the science. How to interpret and use that science in ways that it will engage the current government and they'll be willing to take it on?
- Asking what the environment can do for you may be a useful entry point for inviting government to see different ways of thinking, and firmly places the emphasis on the benefits of preserving ecosystems.
- Not useful to question the underpinning narratives of economic growth and the current economic system. Work with the current paradigm, but emphasis how it can be built upon with GPI and supplemented with good scenario planning.
- Enable narratives that can be operational in the current political climate:
  - Cannot be about climate change.
  - Demonstrate benefits to business and whole supply chain.
  - Identify champions to take it forward.

## Considering the environment in national strategic thinking

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- Note that Australia would benefit from exhibiting leadership on such issues at the G20 meeting etc.
- Anticipate crises and recognise them as opportunities to have a useful response ready.
- Alternative is try to build change from the ground up e.g. crowd sourcing support for the Climate Council. Some cynical about the prospects for doing this, preferring to focus on high level government positions.
- Pick up on things that work, and use those examples to tell stories that a minister can be proud of, that is firmly linked to ecosystem services.
- Ensure messages are consistent with current government focus on clean air, water, land.

### *How can we take account of tradeoffs between ecosystem services that result from policy and/or management decisions?*

- The six participants in the outputs and trade-offs group included three people from research and three from policy. They had a diverse range of interests including variations among stakeholders in framing ecological services, the value and use of ecological services in adaptation to climate change, modelling ecosystems and how to deal with trade-offs between ecosystem services. The discussion was wide ranging.
- Outcomes of ecosystem services are case specific. The system context needs to be clearly specified in order to model outcomes. The relative value of different ecosystem services varies depending geographic and time scales. Different stakeholders frame ecosystem service values differently, for example different values towards species conservation. There may be opportunities to use gaming to establish differential values.
- There is often limited information and analysis of trade-offs between ecosystem services. For example trade-offs between services provided by trees that depend on intercepting rainfall and run-off and groundwater dependent ecosystems are not well established. Further consolidation of available information and new research on trade-offs is needed.
- There is often uncertainty relating to interactions between land, water and biodiversity. The key question is how much information is needed to make management decisions and/or decide between management alternatives. System models can provide useful inputs, for example a model of pelican behaviour can be combined with the water flow model to information for decision support.