

ACT State of the Environment 2011 Report

Executive Summary: Reporting Framework, Themes, and Indicators

Introduction

In 2009, the ACT Commissioner for Sustainability and the Environment initiated a strategic review of the ACT State of the Environment (SoE) reporting framework to assess it against leading SoE approaches used in Australia and internationally. A primary aim of the review was to guide future ACT SoE reporting so that it continues to be effective and relevant for the ACT community and government. This summary outlines the reporting framework with Objectives, Headline Indicators, Reporting Model, Themes and Indicators to be used for the *ACT SoE 2011 Report*. This framework and its themes and indicators have been developed through significant consultation and discussion with experts, Government agencies and the community.

A State of the Environment (SoE) report provides an assessment of the impact of human activities and responses on the environmental condition of a defined geographical area. In the ACT, SoE reporting is a requirement of the *Commissioner for the Environment Act 1993* (the Act). Since 1993/94, the Office of the Commissioner for Sustainability and the Environment (OCSE)¹ has produced six ACT SoE Reports: 1993/94; 1994/95; 1997, 2000, 2003, and 2007. The SoE Report assesses the condition of the ACT environment and progress towards sustainability in accordance with the Act.

In 2007 the most recent ACT SoE Report provided an assessment of the condition of the ACT environment through six Issues papers and 38 broad Indicators covering: climate and greenhouse, air quality, conserving biodiversity, catchment quality, community wellbeing and resource use. There were also two overarching papers: *Progressing Sustainability* and *Overview and Recommendations*.²

Review and consultation process

An iterative process to strategically review, assess and refine the ACT SoE 2011 reporting framework was undertaken. This process included:

- engaging a consultant (Halcrow Pacific Pty Ltd) to review the 2007/08 SoE reporting framework, develop a draft reporting framework, and advise on final Indicator definitions;

¹ The ACT Commissioner for Sustainability and the Environment is an independent statutory position created by the ACT Legislative Assembly under the *Commissioner for the Environment Act 1993*.

² See: <http://www.environmentcommissioner.act.gov.au/publications/soe/2007actreport>

- consulting with four focus groups and a technical Reference Group on a draft reporting framework – the Reference Group has been established to inform the development of the *ACT SoE 2011 Report*; and
- assessing proposed Themes and Indicators and, where appropriate, removing or adding Indicators to best report on the condition of the ACT environment, key trends, and progress towards sustainability.

Objectives for the ACT SoE 2011 Report

An important part of the review of the ACT SoE reporting framework has been establishing a series of objectives for the *ACT SoE 2011 Report*. – These are to:

- provide accurate, timely and accessible information to the community and government regarding trends and the condition of the environment, underlying pressures and sustainability trends;
- evaluate the effectiveness of community and government actions, policies and initiatives in terms of progress towards sustainability;
- increase community and government understanding of environmental and sustainability trends and interactions³;
- satisfy the obligations of the relevant ACT and national legislation; and
- develop recommendations for the Minister.

The ACT SoE 2011 Reporting Model

Different SoE reporting models can be used to structure and bring a consistent order to Themes, Issues and Indicators. SoE models also aid the understanding of how different environmental and sustainability issues are interrelated and interdependent.

Previous ACT SoE reports have used an adapted *Pressure, State, Response* (PSR) model to structure and report on Themes and Indicators. This model indicates the *pressures* of human activities on the environment, the current *condition* (or state) of the environment and natural resources, and the *responses* by governments, business, organisations and the community. More recently, the *Driving force, Pressure, State, Impact, Response* (DPSIR) model has been increasingly used to better illustrate the fundamental *driving forces* that cause *pressures* on the *state* of the environment, and to better highlight resulting *impacts* on the environment, including people and communities.

The DPSIR model is the reporting framework for the *ACT SoE 2011 Report*. Adoption of the DPSIR model for the ACT will provide decision-makers with a more integrated, and long term perspective on environment and sustainability performance.

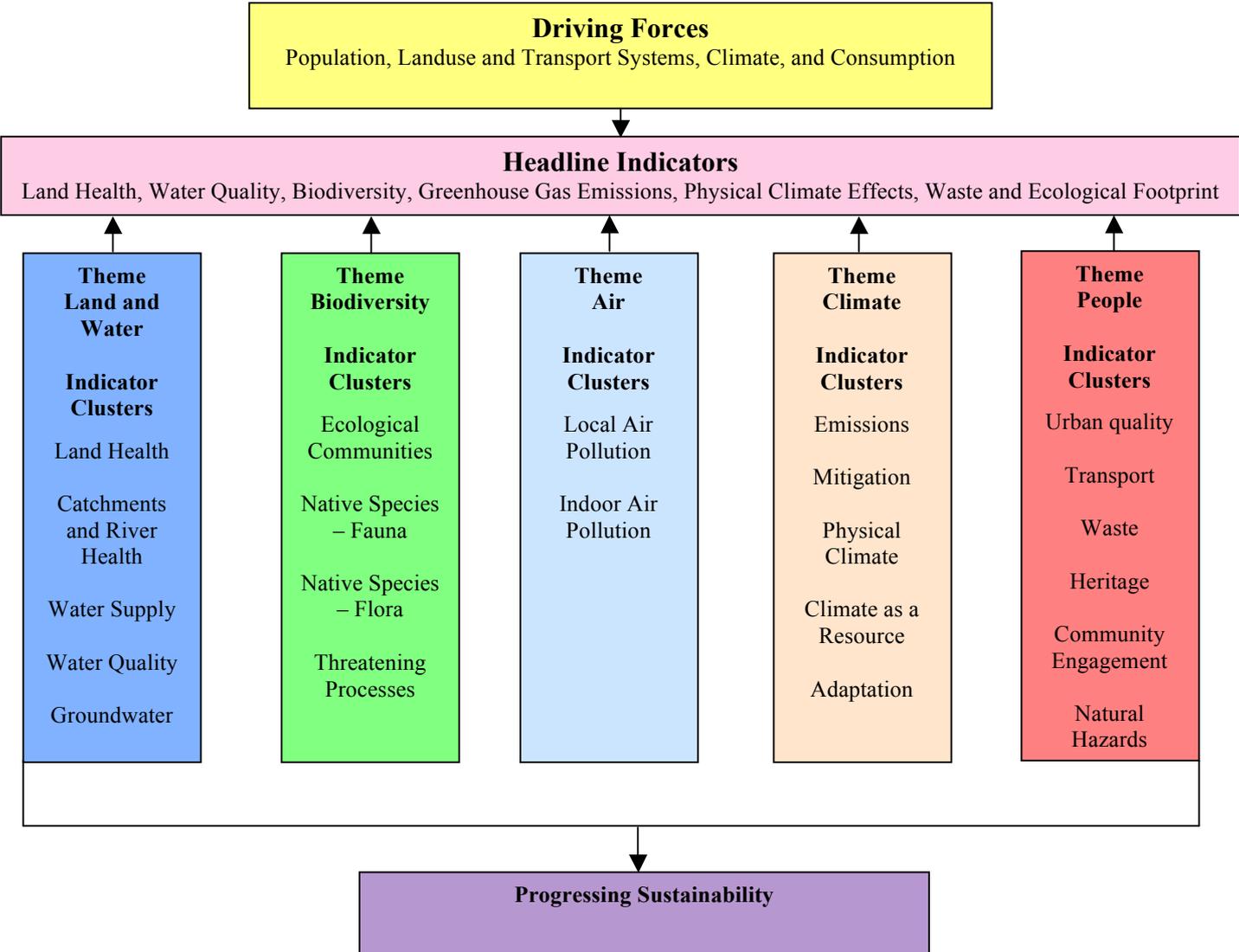
Framework for the ACT SoE 2011 Report

The framework for the *ACT SoE 2011 Report* with Headline Indicators, Themes and Indicators is outlined in figure 1. *Driving forces* are identified separately within this framework and the *Pressure, State, Impact* and *Response* components of the framework

³ In this report environmental interactions includes interdependencies.

are contained within each theme and their respective indicator clusters. Each of the different components is then briefly explained.

Figure 1: ACT SoE 2011 Report Framework



Principal Driving Forces for the ACT SoE 2011 Report

Four *driving forces* that cause fundamental *pressures* on the *state* of the environment have been identified for the *ACT SoE 2011 Report*:

1. **Population** is a key driving force for SoE reporting and allows broad consideration of population impacts and demographic change on the environment. Population growth and changing demographics in the ACT strongly influence demand for housing, infrastructure, and goods and services, and can have significant impacts on all aspects of the *state* of the environment.

2. **Landuse and transport systems** affect the health of ecosystems and quality of life. Landuse and transport systems can significantly impact on resource and energy use, and emissions.
3. **Climate** affects our natural ecosystems and communities. Reporting on the trends in the ACT Climate on a decadal basis from 1950 to 2009 (and from 1910 where possible) will identify how our climate may be changing, including the number and type of extreme weather events (also see the Climate Theme). Climate has always changed and always will change. The significant aspect is that the decadal weather data will allow an analysis of change over time, and an assessment of whether such change may be related to human activities.
4. **Consumption** influences our level of resource use, waste generation and emissions, and reflects our approach and attitudes towards environmental protection. Consumption is a key driving force as the amount and type of economic growth directly impacts on the environment. An ecological footprint will be included in this section. This is a measure of the area of land and water needed to support the resource demands (it includes the raw material for food, building, energy, etc) and absorb the wastes of a given population or specific activity, using prevailing technology and resource management practices.

Headline Indicators

A small set of Headline Indicators in a SoE report can help provide simple and clear information to decision-makers and the general public about the overall condition of the environment. Headline Indicators can be more widely reported and explained compared with the much larger base SoE report.

Seven Headline Indicators have been selected for the *ACT SoE 2011 Report* to best illustrate key environmental parameters and present information on issues which are either directly or indirectly related, or measure if the condition of the environment is improving. The Headline Indicators are:

1. Land Health (Index of key land health Indicators)
2. Water Quality (the differences between Angle Crossing and Halls Crossing)
3. Biodiversity (Index of key biodiversity Indicators)
4. Greenhouse Gas Emissions
5. Physical Climate (Index of key climate parameters)
6. Waste
7. Ecological Footprint.

Progressing Sustainability

Sustainability focuses primarily on ensuring that the health, diversity and productivity of the environment⁴ is maintained for the benefit of current and future

⁴ As outlined in the *Commissioner for the Environment Act 1993* , namely:

generations. The Progressing Sustainability section will provide information for decision makers and the community on the key challenges and opportunities for progressing sustainability in the ACT.

ACT SoE 2011 Report Themes

Identification of reporting Themes within a broader SoE reporting framework assists with classification and provision of a coherent report structure. Reporting through Themes can also be useful where causal links between, for example, *pressures* and *impacts*, can be difficult to determine.

Five Themes identified for the *ACT SoE 2011 Report* are: Land and Water; Biodiversity; Air; Climate; and People.

Indicators for the ACT SoE 2011 Report

Key Indicators have been identified, defined and grouped within Indicator Clusters for the *ACT SoE 2011 Report*. The purpose of the Indicator Clusters is to group related *condition, pressure, impact* and *response* indicators, highlight interconnections and positive and negative relationships.

Indicators for the Land and Water Theme

Land is an important natural asset that provides a range of ecosystem services, such as soil nutrients, water filtering and habitat, which in turn support food production and settlement. Water has many values, including maintaining ecosystems and use for drinking water, irrigation, stock watering, and recreation. Over-extraction of freshwater and groundwater can affect environmental flows and the health of ecosystems.

The five Indicator clusters identified for the Land and Water Theme and key areas that will be reported on are outlined below.

- **Land Health Indicator Cluster:** Important factors contributing to overall land health include soil condition, vegetation and ground cover, erosion rates, salinity and soil acidity. Erosion is a natural process that can be accelerated by human activities and adversely affect water quality in streams and rivers. Some land uses can result in contaminated sites including: former sheep dip sites, landfills, service stations, fuel depots and other hydrocarbon-affected sites.

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- (i) the components of the earth, including soil, the atmosphere and water;
 - (ii) any organic or inorganic matter and any living organism;
 - (iii) human made or modified structures and areas;
 - (iv) ecosystems and their constituent parts, including people and communities;
 - (v) the qualities and characteristics of places and areas that contribute to their biological diversity and ecological integrity, scientific value and amenity;
 - (vi) the interactions and interdependencies within and between the things mentioned in subparagraphs (i) to (v);
 - (vii) the social, aesthetic, cultural and economic conditions that affect, or are affected by, the things mentioned in subparagraphs (i) to (v).

- **Catchments and River Health Indicator Cluster:** Catchment and river health supports a range of ecosystem values and functions. Increasingly, urban wetlands are being constructed to intercept and treat urban stormwater flows and the effectiveness of construction and management of these wetlands is important to improve urban water quality.
- **Water Supply Indicator Cluster:** Environmental flows refer to the release of water in a predetermined manner intended to mimic the natural hydrological pattern in unregulated rivers. The removal and use of water from surface water and groundwater and the timing of this removal and use of water, adversely affects environmental flows and changes the amount and quality of water flowing in and into our rivers and lakes.
- **Water Quality Indicator Cluster:** Water quality influences the health of aquatic and terrestrial ecosystems, and whether water can be safely used for drinking, agriculture, industry and recreation. The maintenance of water quality values is a critical environmental issue.
- **Groundwater Indicator Cluster:** Groundwater is essential for sustaining the ongoing health of many ecosystems, including surface water bodies, such as rivers, wetlands, and lakes, that are connected to groundwater sources. Changes in groundwater levels and groundwater quality have the potential to degrade these ecosystems causing a loss of terrestrial and aquatic species, and impacts on human health and production.

Indicators for the Biodiversity Theme

Biodiversity is the variability of ecosystems, species and genes. Ecosystems provide essential services, such as clean air, fresh water, soil and habitat for native species. Biodiversity also has recreational, cultural, and landscape values that are part of the ACT identity.

The four Indicator clusters identified for the Biodiversity Theme and key areas that will be reported on are outlined below.

- **Ecological Communities Indicator Cluster:** Different vegetation types are the products of different ecological and environmental conditions and, therefore, indicate different habitats and components of ecosystems. Clearing of vegetation reduces the total area of habitat available to species, affects the connectivity of ecological corridors, and can increase the risk of local extinction. The area, distribution and management of protected areas, and the effectiveness of other conservation responses, are important for biodiversity conservation.
- **Native Species – Fauna Indicator Cluster:** Information on threatened native species as well as more common native species informs our understanding of population trends and the health of ecosystems. Assessment of the effectiveness of native species conservation measures and pest management helps identify successes and/or gaps in regulation, programs and initiatives to improve future management.
- **Native Species – Flora Indicator Cluster:** Native plants provide habitat and food for birds and animals but can be affected by overgrazing by animals, weeds, seed gathering and firewood harvesting. Assessing the effectiveness of

native plant conservation measures can help identify successes and/or gaps in current regulation, programs and initiatives to improve future management.

- **Threatening Processes Indicator Cluster:** Much of Australia's flora and fauna has evolved alongside threatening processes such as fire and may rely on these processes for continued survival. However, changes to these processes (for example, fires of high or low intensity that are either too frequent or insufficiently frequent) or new processes can lead to loss of native species, and communities.

Indicators for the Air Theme

Air quality affects the condition of the environment and directly impacts on human health and amenity. There is a legislative requirement for jurisdictions to monitor air quality as per the standards for the National Environment Protection Measure for Ambient Air Quality. The two Indicator clusters identified for the Air Theme and key areas that will be reported on are outlined below.

- **Local Air Pollution Indicator Cluster:** The emission of pollutants into the atmosphere from motor vehicles, burning of fossil fuels and fire can lead to concentrations of gases and particles that have adverse impacts on some ecosystems and human health.
- **Indoor Air Pollution Indicator Cluster:** Sources of indoor air pollutants include household products, human activities, such as smoking and indoor fires, and indoor vehicle pollution. Poor indoor air quality can have adverse impacts on human health and wellbeing.

Indicators for the Climate Theme

The differences between weather, climate, climate variability and climate change are the time scales used for the data and analyses. Climate change refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer (Garnaut 2008).⁵ In contemporary society, the term climate change is often used to refer to the post-industrial global warming trend. The *ACT SoE 2011 Report* will compare decadal weather data from 1950 and onwards, and possibly from 1910 for some data. The five Indicator clusters identified for the Climate Theme and key areas that will be reported on are outlined below.

- **Emissions Indicator Cluster:** The magnitude of emissions in the ACT of the three most important greenhouse gases: carbon dioxide (CO₂), methane (CH₄), and nitrous oxides (NO_x). Energy use is a key contributor to greenhouse gas emissions, along with methane emissions from landfill sites and waste bodies, and nitrous oxides emissions.
- **Mitigation Indicator Cluster:** Emission reductions associated with: new low emission sources of energy, and the transport, waste, infrastructure, building and industry sectors.
- **Physical Climate Cluster:** Understanding the physical climate system and how it is changing in the ACT is crucial to estimating the risks of climate

⁵ Garnaut, R 2008, *The Garnaut climate change review: final report*, Cambridge University Press, Cambridge.

change for water resources, fire regimes, human health, and native species and will help inform the development of appropriate responses.

- **Climate as a Resource:** The ACT climate is a resource and there are further opportunities to harness the power of the wind and sun.
- **Adaptation Indicator Cluster:** Monitoring the effectiveness of adaptation responses will be essential as we deal with a changing ACT climate.

Indicators for the People Theme

As identified in ACT legislation, people and communities are part of the environment.. The way we design and use our urban areas and infrastructure, and how we manage our parks and open space, can significantly affect the quality of the environment. Community engagement and environmental awareness can also have significant impacts on our overall level of resource use and waste production.

The six Indicator clusters identified for the People Theme and key areas that will be reported on are outlined below.

- **Urban Quality Indicator Cluster:** Urban density, and the amount and type of greenfield and infill housing can significantly influence urban form and the overall demand for resources, energy and infrastructure. Open space, parks, recreation areas, community facilities and urban trees contribute significantly to the quality and amenity of urban areas, along with providing important social and health benefits.
- **Transport Indicator Cluster:** Transport asset systems and transport choices have a significant impact on communities and settlements, and the quality of the environment. Different transport modes, such as private vehicles, public transport and walking, have different impacts on the environment and human health.
- **Waste Indicator Cluster:** The amount of urban waste generated and disposed of indicates the pressure of cities and the associated waste on the environment through potential contamination of soils and groundwater, and land used for waste disposal. Hazardous wastes potentially pose either an immediate or long-term risk to the health of humans and the environment.
- **Heritage Indicator Cluster:** There are strong interconnections between the physical environment and heritage. Heritage can include Aboriginal sites, historic heritage places and areas, natural heritage, and other heritage structures or features. The number and condition of heritage listings indicates the community's response to identifying and preserving heritage, and the value placed on heritage in maintaining a sense of place in a region.
- **Community Engagement Indicator Cluster:** Community engagement is important for empowering the community to improve environmental management, and ensuring that issues and concerns are understood and considered as part of decision-making processes.
- **Natural Hazards Indicator Cluster:** A natural hazard may be either a source of potential harm or an existing condition that may cause harm to people or damage to property or the environment. Population growth and urban

development in certain locations can increase exposure to natural hazards, such as flood and fire, with significant economic and social costs.

Changes from previous SoE Reports - comparison of Indicators for the SoE 2011 Report

The review has streamlined and grouped indicators to more directly relate to themes. While most indicators from previous SoE Reports have been retained, however in some cases they are either grouped differently, or will not be reported, for example: number of general practitioners in the ACT. While these unreported indicators related to sustainability issues, they are not directly related to environmental factors, which is the focus of the ACT SoE 2011 Report's objectives.

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- Mr David Marshall, Chair, Canberra Business Council Tourism Sports & Arts Taskforce;
- Mr Geoffrey McAlpine, former CSIRO Principal Adviser Environment;
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