

Executive Summary and Key Findings



THE STATE OF OUR ENVIRONMENT

State of the Environment Report
for South Australia 2003



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For further information please contact:

Information Officer
Environment Protection Authority
GPO Box 2607
Adelaide SA 5001
Telephone (08) 8204 2004
Facsimile (08) 8204 9393
Free call 1800 623 445 (country)

Web site: www.environment.sa.gov.au/soe2003
State of the Environment Education Resource:
www.environment.sa.gov.au/reporting/education.html

Project Team: Clare Nicolson, Julie Payne and Jacob Wallace
(Office of Sustainability, Department for Environment and Heritage)

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Pictured on this page (l-r)

Seagrass

Photo: V. Neverauskas, PIRSA

Church, Burra, Clare Valley, South Australia

Photo: South Australian Tourism Commission

Students monitoring salinity in the Little Para River

Photo: Waterwatch SA

Bool Lagoon, Naracoorte, Limestone Coast, South Australia

Photo: South Australian Tourism Commission



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Preface

The State of the Environment Report for South Australia 2003 discusses the current state, or condition, of our environment, the pressures upon it and our response to those pressures. It also identifies trends over time so that we can assess the effectiveness of our efforts and measure our progress towards achieving a healthy environment that supports a prosperous economy and a vibrant and cohesive society. Importantly, the report makes a series of recommendations on how we can improve our efforts to meet these objectives.

A major aim of the report is to provide scientifically credible information and assessments that will help drive the future environmental agenda for South Australia. A further aim is to inform and stimulate community debate on the significant environmental issues that confront us. The information in the report is structured around seven major environmental themes: Atmosphere, Inland Waters, Coasts and the Sea, Land Resources, Biodiversity, Human Settlements and Heritage.

This summary document sets out the report's major conclusions, and highlights the environmental issues that have been identified by the Board of the Environment Protection Authority as major priorities for the State. It also makes a series of recommendations for action that must be addressed in order to see an improvement in the state of our environment over time. Key findings for each of the seven major environmental themes are also presented.

For more detailed information I encourage you to read the *State of the Environment Report for South Australia 2003*. A Supplementary Report on CD-ROM is also provided. This presents additional data, maps and a more detailed discussion of the issues. Both reports are available on the internet at www.environment.sa.gov.au/soe2003.

A State of the Environment Education Resource is also available. This provides teachers and students with access to information from the report in a format appropriate to their learning needs. The education resource is also available on the internet at www.environment.sa.gov.au/reporting/education.html.

The Environment Protection Authority, via its governing Board, has overseen the report preparation process, and has used the expertise of the State of the Environment Report Steering Committee and the State of the Environment Report project team from the Office of Sustainability, Department for Environment and Heritage, in coordinating and compiling the report.

Finally, I wish to express my deep appreciation to the many people who gave freely of their time in contributing to, and peer reviewing, the various chapters of the report.

Dr Paul Vogel

CHIEF EXECUTIVE and CHAIR
ENVIRONMENT PROTECTION AUTHORITY



Executive Summary

Towards Sustainability

*Pictured above (l-r)
Adelaide and the River Torrens*

*Vale Park Primary School
students sampling
river water*

Spinifex sericeus

The State of the Environment Report for South Australia 2003 sets major challenges for communities, industry and governments. Unless these challenges are met now – by all of us – they will diminish not only the state of the environment but our quality of life.

attitudes to see environmental, and indeed sustainability, principles integrated into major economic decision-making. If we continue to degrade or over-use our environmental resources – the water we rely on to drink and sustain agriculture and industry, the soil in which we grow our food, the animals and plants that we live with and the air we breathe – we will undermine the economy and leave future generations with a serious and increasing environmental debt.

KEY FACTS

- **We all have a responsibility to reduce our consumption of resources and protect the environment for our children and future generations.**
- **Many aspects of the environment have not improved significantly since the last State of the Environment Report in 1998.**

Introduction

The State of the Environment Report for South Australia 2003 provides an objective assessment of the condition of South Australia's environment, the nature of the pressures upon it and current responses to those pressures. It does this by reporting against a series of environmental indicators for a broad range of issues and analysing, where possible, the changes since previous State of the Environment reports (1998, 1993 and 1988). The report also comments on the adequacy of our responses and makes a series of recommendations on how we can improve efforts to protect the environment.

We are not powerless to deal with many of the environmental issues that face us, but to do so effectively will require tough decisions, ongoing commitment and cooperation, and policy integration. We all share the responsibility for looking after the environment – urban and country dwellers alike. Government can provide leadership and direction but we have a collective responsibility for action – as corporate citizens and as individuals.

The information in the report is intended to inform public debate on environmental issues and underpin policy and program development aimed at restoring the environment and preventing future problems.

We must take a long term view of environmental management. Many of the problems that we face today were set in train by historical land management decisions and actions that have been exacerbated by current management practices. The consequences have become apparent over many years and may take an equally long time to fix.

On the whole the news is not good.

Not all the problems can be remedied. Investment programs must therefore use a risk assessment approach to identify priorities and then develop and implement cost-effective and practical solutions.

Many aspects of the environment have not improved significantly and in some cases have deteriorated since the *State of the Environment Report 1998*. Resource consumption is rising as is the amount of the waste we generate. Around one tonne of solid waste per person went to landfill in South Australia in 2002, an increase of 14% over 1998 levels. Our energy consumption is rising each year; we are using water resources unsustainably; and our greenhouse gas emissions continue to rise.

The State of the Environment Report 2003 identifies four major environmental priorities for South Australia. For each priority, the Environment Protection Authority Board makes recommendations that are essential to achieve the required changes.

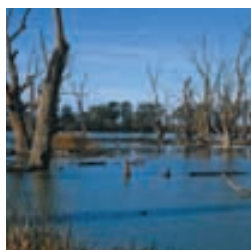
There have been some improvements over the last five to ten years. Lead levels in the air in Adelaide are negligible and no longer a concern; improved land management practices have helped reduce soil loss; and the recovery of a number of threatened species, including the Yellow-footed Rock-wallaby, the Kangaroo Island Glossy Black Cockatoo and the Brushtailed Bettong has been a success story.

Major environmental priorities

Water – use and quality

The future prosperity of South Australia relies on a secure water supply and its limits are a fundamental constraint that must be managed. Water supports human life and sustains the environment. A reliable supply of good quality water underpins sustainable industrial, agricultural, mining and urban development.

Short term economic drivers still tend to over-ride all other considerations and it will take a fundamental change in



*Drowned River Red Gums,
River Murray*



Irrigation of dairy pastures

Since European settlement, water resources in South Australia – rivers, streams, wetlands and groundwater – have suffered pollution, excessive extraction, weed invasion, altered flow regimes, drainage and rubbish dumping. Now water quality is degraded, the health of dependent plants and animals is diminished and ecosystems are disrupted.

The Water Resources Act 1997 requires the management of water resources to recognise and provide for environmental needs, as well as social and economic needs. This is an important legal step forward but significant problems remain.

Despite the licensing of water use, groundwater is still being used beyond estimated sustainable limits on the Northern Adelaide Plains and in areas of the South East to support increasing irrigation. This is starting to affect water quality, particularly in some of the major grape-growing districts in the South East. Water allocation plans for these regions provide management policies that seek to address these issues.

We do not know how much water is being used in areas of the State where use is not licensed. In particular, there is cause for concern about the amount of water being used in the Mount Lofty Ranges.

This prompted an announcement by the State Government in October 2003 that water resources in the Eastern Mount Lofty Ranges are to be prescribed in order to ensure their more sustainable use. All water users in the region will require a license to take and use water.

The frequent detection of unacceptable levels of water-borne parasites such as *Cryptosporidium* and *Giardia* in rivers and streams that flow into major reservoirs in the region, is also cause for concern.

Addressing the declining health of the River Murray is now high on the public agenda. Sustainable use of the River Murray is seriously threatened because too much water is being taken from across the entire Murray-Darling river system, primarily for irrigation: around 80% of all the water we use in South Australia is for irrigation.

In metropolitan and outer metropolitan areas South Australians rely on the River Murray for an average 60% of domestic water supply, while potential alternative sources of water, such as stormwater and treated wastewater, remain under used. Every year around 110 gigalitres¹ of stormwater is discharged to the sea – about the same volume that is piped from the River Murray to supplement Adelaide's water supplies. The WaterProofing Adelaide initiative aims to provide a long term, integrated strategy for ensuring water use in Adelaide and adjacent areas is sustainable.

The recent drought has highlighted the fragile nature of the River Murray and demonstrates that our water management regimes do not adequately take into account the risks posed by the natural drought cycle. This is having an impact on rural and urban communities as regulated water use, water restrictions and water conservation measures come into force.

¹ One gigalitre would cover the Adelaide Oval to a depth of 50 metres.

Increasing salinity in the River Murray poses a serious threat to the quality of South Australia's drinking water over the next 50 years unless further action is taken to intercept saline groundwater as it drains towards the river – the consequence of intensive irrigation development and the clearance of native vegetation in the river's catchments.

And climate change – with predicted lower rainfall and higher temperatures over the next 30 years – poses an additional and serious threat to water resources.

On a more positive note, efforts to improve the management of the River Murray have attracted increasing public recognition. There is now widespread acceptance of the fact that if current degradation continues, the consequences will be significant environmentally, and potentially catastrophic economically and socially.

It is not just up to the South Australian Government to solve the problems of the River Murray – we need the cooperation of upstream States and the Australian Government. And we can all take action that will make a difference. *The River Murray Act 2003* is a significant and innovative development and the \$30 per household River Murray levy is a start.

The use of alternative water sources such as treated wastewater and stormwater for uses other than drinking is gaining acceptance. South Australia is a national and international leader in this field. In the last five years the largest wastewater re-use scheme in Australia has been constructed at Bolivar. Most new urban subdivisions now incorporate water re-use facilities, primarily for irrigation purposes. These achievements, though significant, must be complemented by placing a greater priority on water conservation and efficiency measures, and development of technologies for using non-traditional water resources.

Recommendations for action

Focus the management of water resources in South Australia on the key areas of salinity, diffuse pollution, environmental flows, wiser use, and better integration and coordination of water policy development, regulation and operations.

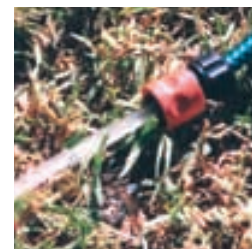
Evaluate the environmental water requirements of major rivers, streams and wetlands and take action to restore environmental flows. In particular, give the River Murray the additional water it urgently requires to restore its health.

Give priority to the development of policy that encourages water conservation and efficiency by all users, and fosters water recycling and re-use schemes throughout urban areas.

For detailed recommendations and more information on these issues please read the chapters on the **River Murray, Water Consumption in Urban Settlements, Water Quality and Water Use** in the *State of the Environment Report for South Australia 2003*.

KEY FACTS

- The availability of reliable and good quality sources of water is essential for the future economic prosperity of the State.
- Protecting the health of the River Murray is now high on the public agenda.
- We must place a higher priority on water conservation and efficiency measures.



Around half of our mains water is used to water the garden

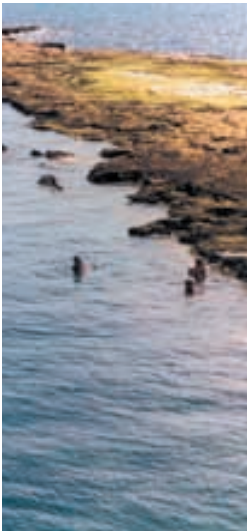


River Torrens

EXECUTIVE SUMMARY

KEY FACTS

- **Continuing degradation of marine water quality will compromise activities such as swimming, surfing, diving and fishing. It will also threaten unique marine plants and animals and may ultimately affect economic returns from commercial fisheries, aquaculture and tourism.**
- **Our marine waters are among the most diverse in the world and provide a home to internationally and nationally important species.**



Port Noarlunga Reef



Rock Lobster fishing boat
Photo: PIRSA

Right: Port River Dolphins
Photo: M. Bosley

Marine and coastal environment

South Australia's marine and estuarine waters provide habitat for a diverse range of plants and animals, including internationally and nationally important species. Ecosystems in our marine waters are among the richest and most diverse in the world, with many species found only in southern Australia. Our beaches are a source of recreation for the community, and an intrinsic and important part of our culture.

The waters also support large commercial and recreational fisheries, as well as a rapidly growing aquaculture industry. By protecting the marine environment we can preserve these environmental, social and economic values into the future.

Poor marine water quality and environmentally insensitive coastal development continue to threaten the marine and coastal environment, including some important seagrass and mangrove communities and reef systems. We still discharge large quantities of stormwater and treated wastewater into the sea and locate industries, infrastructure and urban development in environmentally sensitive areas.

Lack of information on the marine and coastal environment makes it difficult to prioritise actions and develop informed policy. The Adelaide Coastal Waters Study will provide valuable information about the impact of human activities on this area and will underpin sustainable management strategies. Similar baseline studies are required for other areas of the State.

Aquaculture has great economic potential for the State but we do not know enough about the cumulative impact of aquaculture on the marine environment. We must proceed with caution – and put the most appropriate legislative, regulatory and policy arrangements in place – to ensure that the industry is truly sustainable.

Our fisheries are, on the whole, being managed within sustainable limits. However, the management tends to focus on individual species. There is insufficient information on the impact that fishing has on fishery

habitats and ecosystems, information that can only be gained with a more holistic approach.

We are developing a number of programs that seek to improve sustainable management of marine and coastal areas, such as the *Living Coast Strategy*, which is due for release in December 2003. But we need to do more – improve planning, enlarge the information base, reduce pollutant loads to the marine environment and inform and educate the community.

Recommendations for action

Give priority to the conservation and sustainable use of the community's marine resources.

Take action to protect South Australia's coastline from unsustainable development.

Apply caution in developing aquaculture. Fully integrate aquaculture developments with marine and coastal planning and management processes. Ensure approval and regulatory functions are independent of industry development functions.

Focus fisheries management more on ecosystems than on individual fisheries.

Reduce the impact of urban stormwater, treated wastewater and industrial discharges on the marine environment.

*For detailed recommendations and more information on these issues please read the chapters on **Aquaculture, Fisheries and Health of the Marine and Coastal Environment** in the State of the Environment Report for South Australia 2003.*

Climate change

Climate change is probably the most significant global environmental issue that confronts us today. There is now little doubt that the last 50 years of global warming can be attributed to human activity, primarily through the production and consumption of energy which releases





Urban Traffic

large amounts of greenhouse gases, such as carbon dioxide, into the atmosphere.

South Australia can expect extremely serious effects from the predicted increases in temperature (0.2-6°C) and the trend towards declining rainfall (-3% to -40%) over the next 30 to 70 years. During the ice age the global average temperature of 15°C fell to 10-11°C. The potential impact of a similar magnitude of change in the opposite direction requires immediate attention by Government.

Climate change is a long term issue that has the potential to change the extent and range of ecosystems, increase competition for scarce water resources, change the range and distribution of pests, reduce agricultural productivity, raise sea levels and the intensity of storm events, and impact adversely on human health.

In South Australia, our greenhouse gas emissions continue to rise, increasing from 21.48 tonnes of greenhouse gases per person in 1995 to 22.43 tonnes per person in 2001.

The two biggest contributors to greenhouse gas emissions in South Australia are the generation of electricity from power stations (around 28% of emissions) and the use of transport (around 23%). Our emissions from energy use and generation continued to climb in 2000-01, rising by 3.6% over the two years since 1999.

Climate change is largely a global issue but we – as individuals and as a community – can still effect change.

The State Government has given its formal support to ratification of the Kyoto Protocol and its sustainable energy platform commits to the development of a South Australian Greenhouse Plan. The plan is a matter of urgency.

The predicted changes in climate are viewed as inevitable, even if greenhouse gas emissions ceased today. Thus adaptation to a changed climate must be a key theme of any greenhouse plan, which must also encompass all sectors and identify, among other strategies, least cost options to reduce greenhouse gas emissions.

If we are to make a difference we must all reduce our energy consumption. The State Government can play a significant leadership role for business and the community by providing and promoting an efficient and convenient public transport system, encouraging renewable energy industries with incentives and improved infrastructure, developing practical measures

that reduce energy demand, and developing and implementing communication strategies and education campaigns.

The continuing success of the many programs and activities already underway rests on significant commitment from all South Australians.

Recommendations for action

Develop and implement a State Greenhouse Plan and Action Plan – containing key elements on adaptation, emissions reduction, carbon sinks and the roles of Government, industry and the community – as a matter of priority.

Develop transport policies, programs and measures that integrate transport planning more effectively with urban planning and urban form. Focus strategies and incentives on shifting transport use from the car to public transport, walking and cycling.

*For detailed recommendations and more information on these issues please read the chapters on **Climate Change, Energy and Transport** in the State of the Environment Report for South Australia 2003.*

Species loss

Today around one-quarter of all the plants and animals recorded in South Australia are considered to be threatened; for mammals the figure is 63%.

The historical loss of habitat before vegetation clearance controls came in to place is one of the most significant threats to our native plants and animals. Most of the agricultural zone has been cleared of native vegetation and much of the remaining vegetation is in small, isolated patches prone to disturbance and degradation.

Other threats include competition and land degradation by rabbits, feral goats and camels, livestock grazing, predation by feral cats and foxes, dieback caused by diseases such as *Phytophthora cinnamomi*, weed invasion, degradation of waterbodies, altered fire regimes and climate change. Our lack of information on many species adds to the risk of their decline.

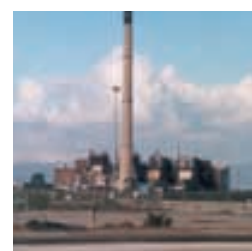
Controls on the clearance of native vegetation in South Australia, introduced in 1983, have slowed the rate at which species are declining but many serious threats still persist. Plants and animals that are at risk today may be

KEY FACTS

- Climate change is likely to have significant environmental, social and economic consequences for South Australians.
- In South Australia our greenhouse gas emissions continue to rise. If we are to make a difference we must all reduce our energy consumption.



Windfarm
Photo: Energy SA



Torrens Island Powerstation



Greater Bilby (*Macrotis lagotis*) – threatened in South Australia
Photo: Peter Canty

EXECUTIVE SUMMARY

KEY FACTS

- **The health of ecosystems and of the many different plants, animals and micro-organisms associated with them is crucial for continuing human health and prosperity – we cannot afford to be complacent.**
- **63% of mammals in South Australia are threatened.**
- **Many serious threats to native plants and animals still persist – until these are addressed species will continue to be lost.**



Pink-lip Spider-orchid (Caladenia behrii) – threatened in South Australia
Photo: Peter Lang

extinct in one or two generations unless we start seriously to address these threats on a landscape scale.

Many species and ecological communities that are declining at a regional level do not receive attention because they do not rate highly on national or State listings. There is a risk that while we focus our investment on the recovery of nationally threatened species, many more will become extinct regionally and across the State.

The State Government is set to address this issue by developing a *No Species Loss* strategy, which seeks to protect threatened species and ecological communities at regional and State levels. The commitment must be major and it must be long term.

State and Federal Governments are responsible primarily for addressing species loss but we will not arrest the decline with the present lack of community understanding. The community must become aware of the importance of biodiversity conservation in ensuring environmental stability and why it is critical to our future survival.

Recommendations for action

Restore habitat on a landscape scale in key regions. This should be adopted as a major principle of natural resource management planning and be incorporated into associated investment strategies.

Develop targeted education and awareness strategies that effectively communicate the critical importance of biodiversity to human society and its fundamental role in maintaining ecological balance.

*For detailed recommendations and more information on these issues please read the chapters on **Introduced Species, Native Vegetation and Threatened Species** in the State of the Environment Report for South Australia 2003.*

How do we achieve change?

There are three fundamental drivers for change that we need to address as a priority if we are to effectively tackle the major environmental issues that confront us: comprehensively reviewing our land use planning system and its administration; expanding our stocks of good quality environmental information and knowledge; and taking a greater responsibility, both as individuals and as a community, for caring for the environment.

Improved land use planning processes

Historically our approach to environmental management has been reactive. We must become proactive and avoid environmental damage in the first place. Economic development must lead to a better quality of life without degrading the environment.

A more informed and sophisticated land use planning process would integrate industrial, urban and infrastructure development with environmental and natural resource management imperatives. Current planning and development controls and environmental impact assessment processes do not have sufficient regard for the cumulative environmental impact of development at regional or catchment levels.

Adelaide's continuing urban sprawl into the Mount Lofty Ranges is polluting water resources, increasing bushfire risk, causing the loss of native vegetation and threatening prime agricultural land. The State Government's recent review of Hills Face Zone policies aims to achieve a more coordinated approach to controlling future land development in the region.

Development along the South Australian coastline, such as housing, marinas and boat ramps, is placing significant pressure on fragile marine and coastal environments. This development is proceeding largely unchecked and without due regard for its impact.

Action is needed now to place stronger controls on development across the State. The environmental impact



*Pictured (l-r)
Housing development
and associated vegetation
clearance in the Mount
Lofty Ranges
Photo: Phil Hazell, EPA
View from Willunga Hill
Vegetation survey
Photo: S. D. Kenny*

assessment process must also ensure that all relevant environmental factors are given adequate attention early in the development approvals process so that cumulative impact can be managed.

Land use planning processes can only be improved if they are coordinated and integrated and support effective partnerships between Government agencies, industry, and rural and urban communities.

Recommendations for action

Address the failure of South Australia's current land use planning system and its administration to deal effectively with the priority environmental issues identified in this report, as part of proposed changes to the land use planning system.

Review the environmental impact assessment process urgently to ensure a more integrated, strategic and across-Government approach to managing the cumulative impact of development.

*For detailed recommendations and more information on planning issues please read the chapters on **Health of the Marine and Coastal Environment, Land Use and Population and Urban Form** in the *State of the Environment Report for South Australia 2003*.*

Reliable, consistent and accurate information

We still do not know enough about the plants, animals, soils and water resources that make up our natural systems and the cumulative impact of human activity upon them. This leaves us vulnerable to the consequences of poor decision-making. Effective public policy relies on the best available information to prioritise action and allocate funding. Wise economic decisions are unlikely without a sound knowledge basis on which to assess the long term environmental risks and social costs and benefits of a course of action.

Neither should we wait for perfect information before acting. To do so would be irresponsible and highly risky as it may condemn parts of our environment to an irretrievable future. Under these circumstances, the application of the precautionary principle and adaptive management strategies are appropriate.

A shared vision for the need and importance of environmental information to underpin good decision-making, particularly among State Government agencies, is therefore essential.

The usefulness of State of the Environment reporting as a diagnostic tool to evaluate changes in our environment over time and the effectiveness of environmental management programs is contingent upon good quality and easily accessible information that is collected consistently over long time periods.

However, consistency between State of the Environment reports can be, and sometimes is, compromised by inconsistent standards and methods for collecting data, changing priorities for data collection, poor integration of Government databases, incomplete data sets, the uncertainty of funding, and the rate of change in data analysis capabilities and information technology.

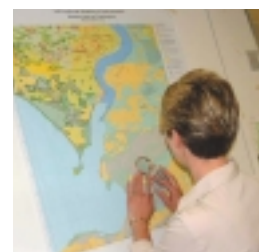
We must place more emphasis on developing long term data collection and management programs that target priority areas if State of the Environment reporting is to achieve its true potential as a useful diagnostic tool. These priority areas must be clearly communicated to research institutions and an appropriate funding strategy put in place that sources funds from industry, and State and Australian Governments.

Recommendation for action

Develop a consistent and integrated approach to gathering, managing and sharing environmental information across Governments and key research institutions, with an emphasis on the information that strategically addresses South Australia's environmental priorities.

KEY FACTS

- **Development in some areas of the State is proceeding unchecked and without sufficient regard for cumulative environmental impact.**
- **Sound environmental information gathered consistently over time is essential to underpin effective decision-making.**
- **Environmental education is the key to driving generational change**



Computerised mapping

EXECUTIVE SUMMARY



Revegetation of a degraded site
Photo: Youth Environment Council of South Australia

Working together

Action must be taken now to avoid further environmental degradation.

It is crucial that every South Australian believes that their actions can lead to a better environment for our children and ourselves. Without community engagement in environmental issues and an understanding that we all share the responsibility to protect and conserve, future generations will not enjoy a healthy environment.

Environmental education is the key to driving generational change. We now have many more courses covering environmental issues in universities and schools than we did ten years ago. Many industries participate in environmental education and training and regional organisations such as Catchment Water Management Boards have made significant progress in engaging communities and increasing awareness about environmental issues. But we need widespread changes in attitudes and behaviour that can only come from effective partnerships between all sectors, including State and Local Government, the community, industry and business.

Over 80,000 South Australians now participate in organised community involvement, monitoring and education programs such as Waterwatch. These programs play an important role in raising awareness about environmental issues but many are subject to short term funding and are not strategic in the sense of offering long term solutions to environmental problems.

Real moves towards sustainability require a more sophisticated and targeted approach to successfully engage the whole community – a community that understands the complexity of the environmental issues that confront us, and the inextricable link between a healthy environment and a prosperous community.

Recommendations for action

Target and develop community education and awareness campaigns within a clear policy framework. Incorporate cost-effective and simple strategies to engage the whole community and emphasise campaigns that address South Australia's environmental priorities.

Establish processes that will build effective working partnerships between industry, residents, business and Government.

Develop and implement strategies that encourage all South Australians to know that, as individuals, they have a **crucial role** to play in protecting and conserving the environment.



The Youth Environment Council working on environmental action projects
Photo: Youth Environment Council of South Australia

Key Findings



THE STATE OF OUR ENVIRONMENT

State of the Environment Report
for South Australia 2003



Atmosphere

*Pictured above (l-r)
The Starfish Hill Windfarm
on the Fleurieu Peninsula
is South Australia's first
windfarm and is being
developed by Tarong Energy
Photo: Tarong Energy*

*Congested traffic on
Main South Road
Photo: Transport SA*

*Jamestown dust storm
Photo: Gavin Young,
Rural Solutions*

Trends

- **Greenhouse gas emissions in total in South Australia: UP 7.8% since 1995.**
- **Greenhouse gas emissions per person: UP from 21.48 tonnes in 1995 to 22.43 tonnes in 2001.**
- **Concentration of ozone-depleting substances in the atmosphere above Australia: DECREASING.**
- **Air quality in metropolitan Adelaide: IMPROVING.**
- **Air quality in regional centres: IMPROVING in Port Augusta; sulphur dioxide and lead levels are still UNACCEPTABLE in some areas of Port Pirie; particulate matter is WORSENING in Whyalla .**

Making progress

The State Government has indicated its support for ratifying the Kyoto Protocol and is committed to the development of a State Greenhouse Plan that will assist in the reduction of greenhouse gas emissions and adaptation to the consequences of climate change.

Environment Protection Authority monitoring over the last decade indicates that Adelaide's air quality is improving and is generally good by national and international standards.

Lead levels in the metropolitan Adelaide airshed have continued to decline and no longer pose a health concern, to the extent that the Environment Protection Authority has ceased monitoring lead in Adelaide as of the end of June 2003.

Australia is either on target or ahead of schedule for the phasing out of all ozone-depleting substances under the Montreal Protocol.

Attention required

South Australia's greenhouse gas emissions continue to rise, increasing by 7.8% between 1995 and 2000/01. Per capita emissions have risen from 21.48 tonnes of greenhouse gases per person in 1995 to 22.43 tonnes of greenhouse gases per person in 2001.

Greenhouse gas emissions from the generation of electricity and industrial activity in particular continue to grow, while fugitive sources, from activities such as gas

production and distribution, amount to 3.44 million tonnes – over 10% of the State's total.

The level of lead in the air from the Pasminco lead smelter in Port Pirie is the most significant air quality issue for South Australia. Over 50% of children in Port Pirie exceed the blood-lead goal set by the National Health and Medical Research Council.

Whyalla's OneSteel facility continues to cause particulate (airborne dust) levels that exceed the Environment Protection Authority requirements on several occasions a year.

Further information

Air Pollution in Major Cities Program
www.nht.gov.au/programs/airqual.html

Australian Greenhouse Office
www.greenhouse.gov.au

Current air quality information for South Australia – Air Quality Index
www.environment.sa.gov.au/reporting/atmosphere/airindex_sum.html

Environment Australia's ozone program
www.ea.gov.au/atmosphere/ozone/index.html

Kyoto Protocol
unfccc.int/resource/convkp.html

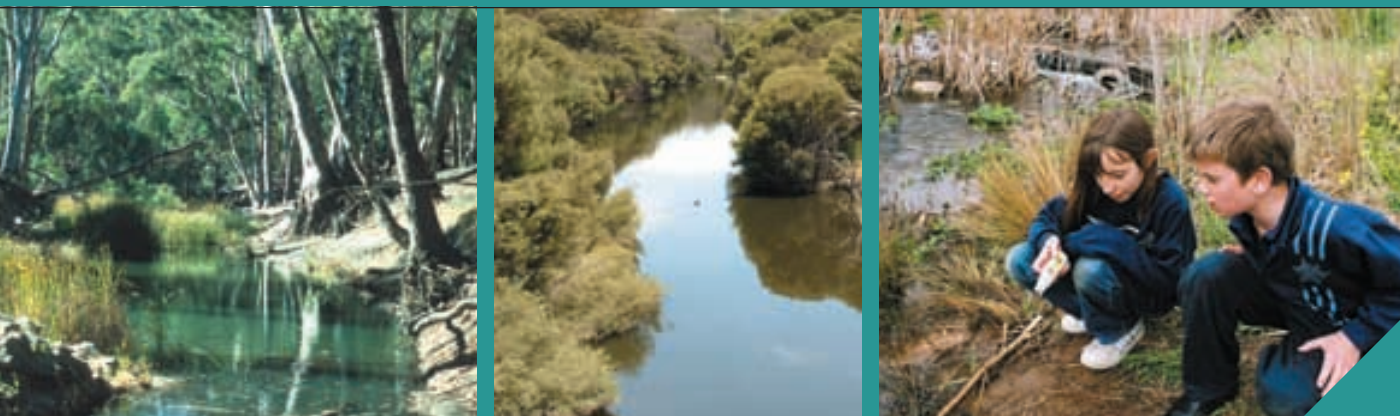
National Greenhouse Inventory
www.greenhouse.gov.au/inventory

National Pollutant Inventory
www.npi.gov.au

The Montreal Protocol
www.unep.ch/ozone/index.html



OneSteel, Whyalla



Inland Waters

Trends

- **Salinity levels in the River Murray: predicted to INCREASE significantly over the next 50 years without further remedial action.**
- **Use of water from the River Murray: INCREASING**
- **Health of rivers, streams and wetlands: VARIABLE but generally in decline due to increasing extraction and drainage for agricultural purposes.**
- **Groundwater quality: DECLINING in some regions, particularly on the Northern Adelaide Plains and in parts of the South East.**
- **Water use in areas where use is required to be licensed: RELATIVELY STABLE in most areas.**
- **Water use in areas where use is not required to be licensed: UNCERTAIN and LIKELY INCREASING.**

Making progress

There has been a more integrated approach to water resource use and management in South Australia, particularly by Catchment Water Management Boards, over the last five years.

The first assessment of river health throughout the State has been completed as part of the Australian River Assessment System (AUSRIVAS).

A *Wetlands Strategy for South Australia* was released in early 2003 providing, for the first time, a framework for an integrated approach to wetlands management.

The Environment Protection (Water Quality) Policy will provide an important regulatory framework for consistent water quality management across the State.

The River Murray Improvement Program, to be funded by the River Murray levy over the next four years, is a major commitment and an important step towards improving the health of the River. *The River Murray Act 2003* is a significant and innovative development.

The State Government's plan for rehabilitation of the lower Murray irrigated dairy pastures should see an improvement in water use efficiency and water quality in the region.

Attention required

Sustainable use of the River Murray is seriously threatened because too much water is being taken from across the Murray-Darling river system, primarily for irrigation.

Increasing salinity in the River Murray poses a serious threat to our drinking water over the next fifty years unless further action is taken to intercept saline groundwater as it drains towards the River.

We do not know how much water is being used in areas of the State where use is not licensed. In particular, there is cause for concern about the amount of water being used in the Mount Lofty Ranges.

In areas where water use is required to be licensed, groundwater is being used beyond estimated sustainable limits on the Northern Adelaide Plains, Tatiara (Hundred of Stirling) and Padthaway due to intensive irrigation development.

Many rivers, streams and wetlands continue to decline in condition and the threats to their long term health persist.

There is no comprehensive, State-wide, scientifically based information on the condition or extent of wetlands in South Australia.

The frequent detection of the water-borne parasites *Giardia* and *Cryptosporidium* in rivers and streams of the Mount Lofty Ranges is cause for concern.

Further information

AUSRIVAS

<http://ausrivas.canberra.edu.au>

Catchment Water Management Boards

www.catchments.net

Department of Water, Land and Biodiversity Conservation

www.dwlbc.sa.gov.au

Murray-Darling Basin Commission

www.mdbc.gov.au

SA Water

www.sawater.com.au

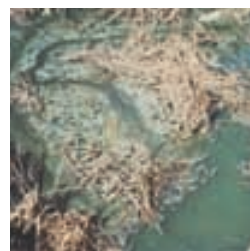
Wetlands in South Australia

www.environment.sa.gov.au/biodiversity/ecocons.html

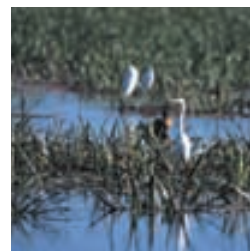
*Pictured above (l-r)
Creek in the
Flinders Ranges
Inman River*

*Students monitoring
salinity in the Little
Para River*

Photo: Waterwatch SA

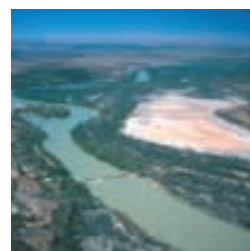


Polluted water



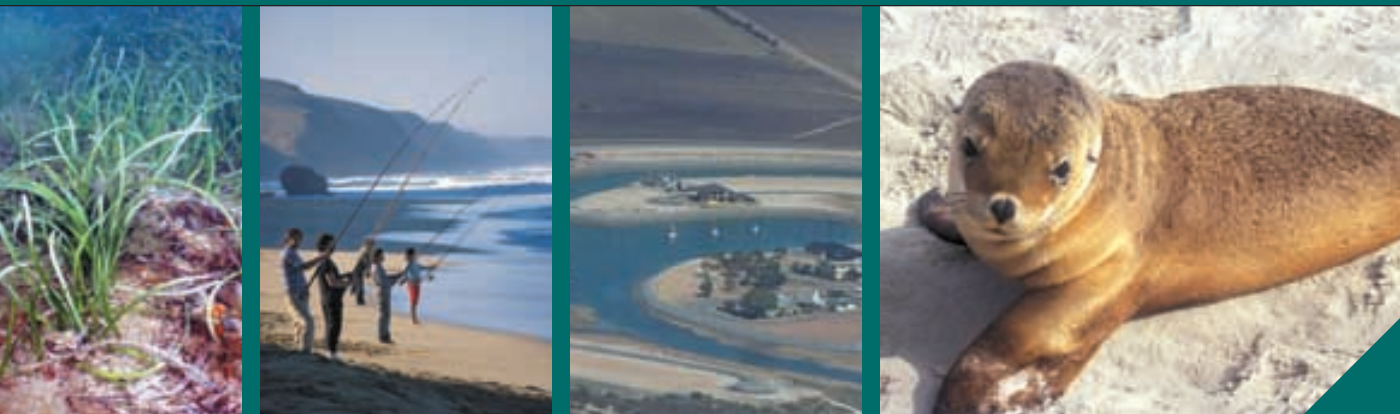
*Bool Lagoon, Naracoorte,
Limestone Coast,
South Australia*

*Photo: South Australian
Tourism Commission*



*River Murray Lock Two
at Waikerie*

*Photo: Michael Bell,
courtesy Murray-Darling
Basin Commission*



Coasts and the Sea

Pictured above (l-r)
Seagrass

Photo: V. Neverauskas,
PIRSA

Fishing on Lock's Well
Beach, Eyre Peninsula,
South Australia

Photo: South Australian
Tourism Commission

Marina development at
Tumby Bay

Photo: Alison Eaton,
Coast and Marine Branch

Endangered Australian
Sea Lion, Seal Bay,
Kangaroo Island,
South Australia

Photo: South Australian
Tourism Commission

Trends

- **Area of seagrass along the Adelaide coastline: DECREASING** with 720 hectares lost between 1995 and 2002.
- **Area of mangroves: DECREASING** in selected locations along the South Australian coastline.
- **Development along the South Australian coastline: INCREASING.**
- **Pollutant loads in wastewater discharged into Gulf St Vincent: DECREASING.**
- **Marine Protected Areas: UP** from 3.5% of total State waters in 1996 to 4.4% in 2002.
- **Most of South Australia's fisheries are FULLY EXPLOITED.**
- **Snapper in Gulf St Vincent and Northern Zone Rock Lobster are OVERFISHED.**
- **Volume of aquaculture production: INCREASED** 349% from 3883 tonnes in 1996/97 to 13,548 tonnes in 2001/02.

Making progress

The *Living Coast Strategy*, to be released in December 2003, is a new South Australian initiative that aims to achieve sustainable management of the coast and marine environment through the implementation of ecosystem-based management practices.

Marine planning is also undergoing review. A pilot marine plan for Spencer Gulf is under development. Priority must be given to completing marine plans for other regions.

A review of the *Fisheries Act 1982* is underway, with the aim of updating the legislation to reflect contemporary management practices and provide for an ecosystem-based approach to fisheries management.

The *Aquaculture Act 2001* is a significant improvement in legislation for the management of aquaculture operations in South Australia.

Attention required

The continued development of coastal areas, if allowed to proceed unchecked and without consideration of the long term and cumulative impact on the environment, will

irreversibly affect the nature of South Australia's coastline and lead to significant damage that may be difficult and costly to repair.

Poor water quality continues to threaten the health of aquatic plant and animal communities in the Port River. Water quality in the Patawalonga Lake and beaches adjacent to the Barcoo Outlet are of poor quality for recreational purposes in the days immediately following a storm.

The management of fisheries tends to occur at the individual species level, rather than the habitat or ecosystem level.

There is insufficient information available on the impact aquaculture has on marine and freshwater environments in South Australia. Given the rate this industry is growing, more research needs to be undertaken within South Australia on the sustainability of this increasingly important economic activity.

Further information

Aquaculture in South Australia
www.pir.sa.gov.au

Coastcare South Australia
www.ea.gov.au/coasts/coastcare/state/sa/index.html

Department for Environment and Heritage
– Coasts and Marine
www.environment.sa.gov.au/coasts/index.html

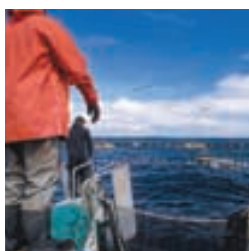
Environment Australia – Coasts and Oceans
www.ea.gov.au/coasts/index.html

Fisheries in South Australia
www.pir.sa.gov.au

SARDI Aquatic Sciences
www.sardi.sa.gov.au/aquatic/index.html



Prawn boats docked at
Port Lincoln



Tuna pen, Port Lincoln
Photos: PIRSA



Land Resources

Trends

- **Extent of acid soils and rates of soil acidification in South Australia: INCREASING** and will continue to increase unless the level of remedial action is significantly increased.
- **Rates of soil loss to water and wind erosion in South Australia: SLOWLY DECLINING** but unsustainable levels of soil loss still occur during extreme weather events.
- **Residential land use: INCREASING** in semi-urban regions with resulting pressures on biodiversity, water resources and agricultural land.
- **Change from relatively low intensity land use (such as grazing) to higher intensity uses (such as viticulture and plantation forestry): INCREASING** in some regions.
- **Awareness and acknowledgement of site contamination: INCREASING.**
- **Extent of dryland salinity in South Australia: STABLE NOW** but **INCREASING** in the long term.

Making progress

Soil loss associated with agricultural land use has reduced considerably over the past 50 years and continues to decline as a result of improved crop and land management practices.

There is an increasing awareness of environmental issues in the wine, forestry, mining, dairy and other industries and many are developing Environmental Management Systems. This is resulting in improved land management practices.

The inception of the Natural Heritage Trust has resulted in a more regionalised approach to dryland salinity. Salinity management is now relatively well advanced in the Murray-Darling Basin and the Upper South East.

Attention required

Current planning and development controls do not have sufficient regard for the cumulative environmental impacts of land use change at regional

or catchment levels. Environmentally insensitive development is continuing to have significant environmental impacts, particularly in the Mount Lofty Ranges.

Site contamination continues to cause environmental and human health concerns. Recent contamination issues (such as at Birkenhead and the Port Stanvac Oil Refinery) have placed a high priority on amending current legislation to ensure that site contamination is adequately addressed and managed in South Australia.

Accelerated soil acidity is now emerging as a major issue – rates of acidification have increased significantly over recent years.

While the extent of dryland salinity has temporarily declined, in the long term it is predicted to increase by 60% in 50 years' time, unless significant on-ground action such as environmentally responsible drainage is undertaken.

Dryland salinity is affecting water quality, natural ecosystems and biodiversity, and is causing land and wetland degradation in key areas around the State, including several conservation parks. Regional economic and social effects are also significant.

Further information

Mount Lofty Ranges Catchment Program
www.mlrcp.sa.gov.au

National Land and Water Resources Audit
www.nlwra.gov.au/atlas

Planning SA
www.planning.sa.gov.au

Primary Industries and Resources SA
www.pir.sa.gov.au

Salt Control SA
www.saltcontrolsa.com

*Pictured above (l-r)
 Water erosion of soil.
 Scenes like this are becoming rarer as
 landholders adopt
 sustainable land
 management practices*

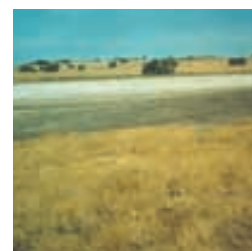
*Photo: M. Young,
 Rural Solutions SA*

*Tasmanian Blue Gum
 plantation
 Photo: Forestry SA*

*Applying lime in
 a vineyard
 Photo: Brian Hughes,
 Rural Solutions SA*



Piccadilly Valley



*Samphire and sea barley
 grass indicating dryland
 salinity*



Biodiversity

*Pictured above (l-r)
Yellow-footed Rock-wallaby,
Flinders Ranges
Photo: T. Robinson*

*Female Southern Emu
Wren, Mount Compass
Photo: Deb Hopton*

*Bridal Creeper smothering
native vegetation, Owen,
South Australia
Photo: John Virtue*

Trends

- **Broadacre vegetation clearance: HALTED except under regulated conditions.**
- **Area of land held under Heritage Agreements: UP 12% (60,749 hectares) since 1998.**
- **Area of land held in National Parks and Wildlife Reserves: UP 1.6% (334,937 hectares) since 1998.**
- **The number of plants, animals and ecological communities at risk: INCREASING particularly at the regional level.**
- **Recovery efforts for threatened species: have INCREASED significantly but remain less than is required to minimise the potential for species loss.**
- **Rabbit numbers: DECLINING since the introduction of Rabbit Haemorrhagic Disease, although the extent of the decline varies.**
- **Fox numbers: DOWN in high priority conservation areas due to baiting programs; STILL A PROBLEM in other parts of the State.**
- **Extent of terrestrial pest plants: INCREASING.**

Making progress

Vegetation clearance is now subject to much stricter controls as a result of recent (2002) amendments to the *Native Vegetation Act 1991*. The amendments prohibit broadacre clearance of intact native vegetation and impose much stricter penalties for illegal clearance.

We have seen a number of success stories in terms of the recovery of threatened plants and animals. Recovery success stories include the Yellow-footed Rock-wallaby, Kangaroo Island Glossy Black Cockatoo, Brushtailed Bettong, Greater Bilby and Greater Stick-nest Rat.

Naturally recurring outbreaks of Rabbit Haemorrhagic Disease (RHD) continue to hold rabbit numbers at greatly reduced levels across most of the State compared to before the introduction of RHD.

Feral goat and fox numbers in the Flinders Ranges are generally low as a result of activities undertaken during Operation Bounceback. This is having a positive impact on Yellow-footed Rock-wallaby populations and native vegetation condition.

Attention required

Around one-quarter of all South Australian species are considered to be threatened. In particular, 63% of South Australia's mammals are at risk.

Many species are declining at a regional level, but they often receive inadequate attention because they do not rate highly on national or State listings. There is a risk that while we focus our investment on the recovery of nationally threatened species, many more will become extinct regionally.

Scientific techniques for measuring the condition of key vegetation communities are yet to be developed. In light of the many threats to native vegetation, this is a critical shortcoming.

Many of our national parks and reserves do not have formal management plans.

To date, most revegetation efforts using native species have been small scale, ad hoc and not specifically designed to meet the needs of biodiversity conservation.

Despite control efforts, most terrestrial weeds remain a problem. Feral camel and deer numbers are increasing and there is, as yet, no coordinated approach to their control.

The impact that introduced fish are having on the ecology of rivers, streams and the sea is poorly understood. This may risk the survival of native fish, aquatic plants and other aquatic animals and their habitats.

Further information

Australia's Native Vegetation
www.ea.gov.au/land/vegetation/index.html

Conserving Biodiversity – Native Vegetation
www.environment.sa.gov.au/parks/native_education.html

National Weeds Strategy
www.weeds.org.au

Operation Bounceback
www.environment.sa.gov.au/biodiversity/threatened.html

South Australian Animal and Plant Control Commission
SustainableResources.pir.sa.gov.au



*The stomach contents of this average sized female cat revealed an unusually large number of native and introduced animals including 33 reptiles, one house mouse and one Zebra Finch
Photo: John Read*



*Mount Monster
Conservation Park*



Human Settlements

Trends

- Household participation in recycling: **INCREASING**
- The amount of waste going to landfill: **INCREASING**
- Per capita water consumption in Adelaide: remains **STEADY** at 460 litres per day in 1997/98 and 445 litres per day in 2001/02.
- Re-use of treated wastewater: **UP** from 7.6% in 1995 to 15% in 2002.
- Total energy consumption: **UP** by 10% between 1993/94 and 1998/99, per capita consumption has increased by a similar percentage.
- South Australia's population growth: **DECLINING** from 2.4% per year in the 1960s to 0.5% per year between 1996 and 2001.
- Trips by car in metropolitan Adelaide: **UP** by 12% on weekdays between 1986 and 1999.
- Public transport use: **INCREASED** 6% between 2000 and 2002 following a decade of decline.

Making progress

A new waste management body – Zero Waste SA – has been announced to continually reduce the amount of waste going to landfill by working closely with State and Local Governments and relevant stakeholders to encourage everyone to recycle.

In 1998 less than 0.1% of South Australia's energy was supplied from renewable resources. It is expected that windfarms approved in the last year (2002) will increase the State's power generation capacity from renewable resources to 4.6%.

An urban growth boundary has been established to arrest Adelaide's urban sprawl and encourage higher density residential development closer to the city's centre and major transport and service nodes.

The Green City program aims to brand Adelaide as an internationally acclaimed green city – recognised for its environmental and sustainability initiatives.

Improved services and enhancements to the public transport system have resulted in public transport patronage increasing by 6% between 2000 and 2002 following a decade of decline.

A Draft Transport Plan for South Australia has been released for consultation. This identifies a vision for a more sustainable and integrated transport system.

Attention required

Despite an increase in the number of people recycling, the amount of waste going to landfill is increasing. Much of this is from construction and demolition activity.

It is estimated that over half of drinking-standard water consumed by typical households is used to maintain the garden.

Only around 15% of stormwater and 15% of treated wastewater is being re-used to supplement more traditional water supplies.

The expansion of residential development into the Mount Lofty Ranges, one of the most populated water catchments in Australia, raises significant environmental concerns.

Oil, primarily in the form of petrol, supplies 47% of South Australia's energy needs.

South Australia remains a car-dependent society with 79% of all weekday trips made by the car in 1999.

Further information

Department for Environment and Heritage – sustainability
www.environment.sa.gov.au/sustainability

Energy SA
www.energy.sa.gov.au

Environment Protection Authority – waste
www.epa.sa.gov.au

Green City Program
www.capcity.adelaide.sa.gov.au/html/projects.html#green

Planning SA
www.planning.sa.gov.au

SA Water
www.sawater.com.au

Transport SA
www.transport.sa.gov.au

*Pictured above (l-r)
Solid waste to landfill
Around half of our
water is used to water
the garden
Adelaide*



*Congested traffic
Photo: Transport SA*



*Housing Development
Golden Grove*



Heritage

*Pictured above (l-r)
Aboriginal artefacts –
hammerstone, grindstone
fragment, and stone flakes.
Evidence of Aboriginal
occupation such as these
can be found throughout
the State*

*Photo: Department for
Aboriginal Affairs and
Reconciliation*

*Palm House,
Botanic Gardens*

Photo: Richard Humphrys

*Murphy's Haystacks, Eyre
Peninsula, South Australia*

*Photo: South Australian
Tourism Commission*

Trends

- **Number of items added to the State Heritage Register: UP by 85 places or 4% since 1998.**
- **Number of shipwrecks declared historic: UP by 32 shipwrecks or 20% since 1998.**
- **Verification of sites on the Central Archive of Aboriginal Heritage: LESS THAN what is required.**
- **Awareness of the importance of cultural landscapes: INCREASING.**

Making progress

The Regional Heritage Survey Program commenced in 1981 and has been completed (with the exception of the far north and far west). It provides a systematic record of heritage sites throughout the State, vastly improving our knowledge base.

There has been an expansion of the Heritage Adviser network that services local Councils leading to considerable improvement in the management of heritage issues at Local Government level.

There is increasing community interest in urban character, that is, an interest in what can be termed 'heritage' beyond what is recorded on State and local heritage registers.

The State Heritage Fund received an injection of funding in 2001, providing greater support for heritage conservation. However, significant funding issues remain at the local and State levels.

Maritime heritage conservation strategies have attracted greater funding in recent years. Emphasis is now being placed on strategies within Commonwealth waters.

Programs to increase the public appreciation of heritage (e.g. Awards) have been initiated.

Attention required

There are no provisions for the systematic monitoring and maintenance of heritage buildings entered in the State Heritage Register or sites and objects recorded

on the Central Archive of Aboriginal Heritage. This places many of these buildings, sites and objects at considerable risk of deterioration and, ultimately, loss.

There is no formal program of systematic regional site surveys to locate and identify Aboriginal heritage sites that are not already recorded on the Central Archive.

Large areas of the State are still relatively undocumented in terms of their Aboriginal heritage and this leaves sites in these areas vulnerable to mining and exploration, pastoralism, tourism and natural weathering processes.

Local Councils have been slow to take advantage of the provisions in the *Development Act 1993* to protect places of local heritage value and need additional assistance to do so.

Further development of initiatives to improve community appreciation and understanding of heritage is required.

Cultural landscapes are increasingly threatened by development, particularly along the South Australian coastline.

Further information

Aboriginal Heritage Act 1988

www.austlii.edu.au/au/legis/sa/consol_act/aha1988164/index.html

Australian Heritage Commission

www.ahc.gov.au

Australian Heritage Directory

www.heritage.gov.au

Heritage Act 1993

www.austlii.edu.au/au/legis/sa/consol_act/ha199386/index.html

Heritage Branch website

www.environment.sa.gov.au/heritage

National Trust of South Australia

www.nationaltrustsa.org.au



*Church, Burra, Clare Valley,
South Australia*

*Photo: South Australian
Tourism Commission*



*Kayaking at the SS Glaucous
wreck, part of the Garden
Island Ships' Graveyard
Maritime Heritage Trail,
Port Adelaide.*

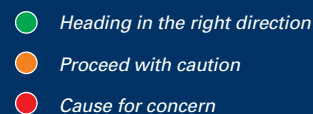
*Photo: Department for
Environment and Heritage*

Air Quality

Air quality in metropolitan Adelaide

Air quality in regional centres

- **Improving** and generally good by national and international standards.
- **Improving** in Port Augusta.
- Sulphur dioxide and lead levels are still **unacceptable** in some areas of Port Pirie.
- Particulate matter in Whyalla is **worsening**.



Climate Change

Greenhouse gas emissions in total in South Australia

Greenhouse gas emissions per person

- **Up** 7.8% since 1995. Emissions from the generation of electricity and industrial activity in particular continue to grow.
- **Up** from 21.48 tonnes in 1995 to 22.43 tonnes in 2001.

Ozone Depletion

Concentration of ozone-depleting substances in the atmosphere above Australia

- **Decreasing**, predictions indicate that signs of ozone recovery will start to be noticed over southern Australia in the next ten to fifteen years.

River Murray

Salinity levels in the River Murray

Other water quality in the River Murray

Use of water from the River Murray

- Predicted to **increase** significantly over the next 50 years without further remedial action.
- **Moderate to poor**; no significant change since 1998. Water quality in general shows a marked deterioration progressively downstream towards Taillem Bend.
- **Increasing** – too much water is being taken for irrigation from across the Murray-Darling river system.

Rivers, Streams and Wetlands

Health of rivers, streams and wetlands

- **Variable** but generally in decline due to increasing extraction and drainage for industrial, domestic and agricultural purposes.

Water Use

Water use in areas where use is required to be licensed

Water use in areas where use is not required to be licensed

- **Relatively stable** in most areas, use of groundwater is currently above the estimated sustainable limit on the Northern Adelaide Plains and in parts of the South East.
- **Uncertain and likely increasing**, use of surface water is currently above the estimated sustainable limit in the Mount Lofty Ranges.

Water Quality

Water quality in rivers and streams of the Mount Lofty Ranges

Groundwater quality

- **Moderate to poor**; no significant change since 1998.
- **Declining** in some regions, particularly on the Northern Adelaide Plains and in parts of the South East. The single biggest threat to groundwater quality across the State is salinity.

THE STATE OF OUR ENVIRONMENT AT A GLANCE

● Heading in the right direction

● Proceed with caution

● Cause for concern

Health of the Marine and Coastal Environment

Area of seagrass along the Adelaide coastline

● **Decreasing**, with 720 hectares lost between 1995 and 2002.

Area of mangroves

● **Decreasing** in selected locations along the South Australian coastline.

Development along the South Australian coastline

● **Increasing**

Pollutant loads in wastewater discharged into Gulf St Vincent

● **Decreasing**

Marine Protected Areas

● **Up** from 3.5% of total State waters in 1996 to 4.4% in 2002.

South Australia's fisheries

● Most are **fully exploited**, Snapper in Gulf St Vincent and Northern Zone Rock Lobster are **overfished**.

Volume of aquaculture production

● **Increased** 349% from 3883 tonnes in 1996/97 to 13,548 tonnes in 2001/02.

Dryland Salinity

Extent of dryland salinity in South Australia

● **Stable now but increasing** in the long term.

Land Use

Residential land use

● **Increasing** in semi-urban regions with resulting pressures on biodiversity, water resources and agricultural land.

Change from relatively low intensity land uses to higher intensity uses

● **Increasing** in some regions, notably the Mount Lofty Ranges.

Awareness and acknowledgement of site contamination

● **Increasing**, since the *State of the Environment Report 1998* there have been significant advances in our knowledge and understanding of site contamination.

Soil Acidity and Erosion

Extent of acid soils and rates of soil acidification in South Australia

● **Increasing** and will continue to increase unless the level of remedial action is also significantly increased.

Rates of soil loss to water and wind erosion in South Australia

● **Slowly declining** but unsustainable levels of soil loss still occur during extreme weather events.

Introduced Species

Rabbit numbers

● A **decline** since introduction of Rabbit Haemorrhagic Disease (RHD, also known as calicivirus) although the extent of the decline varies across the State.

Fox numbers

● **Down** in high priority conservation areas due to large-scale baiting programs; **still a problem** in other parts of the State.

Feral camel and deer numbers

● **Up**

Feral goat numbers

● **Declining** across the State.

Feral pig numbers

● **Unknown**

Mundulla Yellows and *Phytophthora cinnamomi*

● **Spreading**

Extent of terrestrial pest plants

● **Increasing**

Native Vegetation

Broadacre vegetation clearance

● **Halted** except under regulated conditions.

Area of land held under Heritage Agreements

● **Up** 12% (60,749 hectares) since 1998.

Area of land held in National Parks and Wildlife Reserves

● **Up** 1.6% (334,937 hectares) since 1998.

Revegetation activity

● **Stable**; no change since 1998.

Threatened Species

The number of plants and animals and ecological communities at risk

● **Increasing** particularly at the regional level.

Recovery efforts for threatened species

● Have **increased** significantly across the State but remain less than is required to minimise the potential for species loss.

Energy

Total energy consumption

● **Up** by 10% between 1993/94 and 1998/99, per capita consumption increased by a similar percentage.

Proportion of the State's power generation capacity that is powered by renewable resources

● **Increasing** from 0.1% in 1998 to approximately 4.6%, when windfarms approved in the past year are constructed.

● *Heading in the right direction*
 ● *Proceed with caution*
 ● *Cause for concern*

Population and Urban Form

South Australia's population growth

● **Declining** from 2.4% per year in the 1960s to 0.5% per year between 1996 and 2001.

The availability of undeveloped land for new housing development

● **Declining**

The number of new homes being built on redeveloped sites within metropolitan Adelaide

● **Increasing**

Population density

● **Increasing** in the metropolitan area.

Average household size

● **Declining** – this will probably continue to increase the demand for housing faster than the growth in population, posing challenges for the natural environment of Adelaide and surrounding areas.

Transport

Trips by car in metropolitan Adelaide

● **Up** by 12% on weekdays, 5.7% on Saturdays and 0.3% on Sundays between 1986 and 1999.

The number of people using public transport

● **Increased** 6% between 2000 and 2002 following a decade of decline.

Vehicle registrations

● **Up** 3% between 1998 and 2002.

Road freight tonne-kilometres travelled

● **Up** by 0.762 billion tonne-kilometres between 1997/98 and 2000/01.

Age of South Australia's vehicle fleet

● **Slight decline** from 12.1 years in 1998 to 11.9 years in 2002 – still above the national average of 10.5 years.

Waste

Amount of solid waste sent to landfill

● Approximately one tonne of solid waste for every person in 2001/02.

Household participation in recycling

● **Up** from 1996 to 2000 particularly for clothing and rags (up 19%), plastics (up 14%) and garden waste (up 9%).

Litter

● **Up** 3% since 1998 after a downward trend from 1998 to 2000.

Amount of hazardous waste

● **Up** 60% since 2000.

Water Consumption

Per capita water consumption in the Adelaide metropolitan area

● Remains **steady** at 460 litres per day in 1997/98 and 445 litres per day in 2001/02.

The quality of mains water supplied to the Adelaide metropolitan area

● **Continues to comply** with the national drinking water quality guidelines.

Re-use of treated wastewater

● **Up** from 76% in 1995 to 15% in 2002.

Heritage

Number of items added to the State Heritage Register

● **Up** by 85 places or 4% since 1998.

Number of shipwrecks declared historic

● **Up** by 32 shipwrecks or 20% since 1998.

Verification of sites on the Central Archive of Aboriginal heritage

● **Less than** what is required.

Awareness of the importance of cultural landscapes

● **Increasing**

Glossary

Acid soils Any soil with a pH less than 7.5; problem acid soils are those with a pH less than 5.5. Soils can become acidic from farming practices.

Air pollution Contamination of the atmosphere resulting from the emission of undesirable substances and gases, or the formation of these gases by chemical reactions in the atmosphere.

Aquaculture The commercial growing of marine and freshwater animals or aquatic plants; also termed fish farming.

Atmosphere The composite layer of colourless, odourless gases, known as air, surrounding the earth.

Biodiversity Biodiversity, or biological diversity, is the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part.

Climate change The predicted result of the 'enhanced greenhouse effect'. Scientists predict that an increase in the concentration of greenhouse gases in the atmosphere will cause rising global temperatures and a change in the earth's climate.

Dryland salinity Where the natural water balance has been disrupted due to changing land use (e.g. vegetation clearance) excess water filtering through the soil mobilises salt. This excess water then filters down to the groundwater, causing it to rise and bringing the salt to the surface.

Ecological sustainability The capacity of ecosystems to maintain their essential processes and functions and to retain their biodiversity without impoverishment.

Ecology The study of the relationships between living organisms and their environment.

Ecosystem A community of plants and animals that is considered as a total unit with its physical environment.

Enhanced Greenhouse Effect The natural greenhouse effect (caused by the presence of certain gases in the atmosphere which act to retain heat) maintains earth at a habitable temperature. The enhanced greenhouse effect is caused by human emissions of greenhouse gases vastly increasing the concentrations of these gases in the atmosphere. Scientists predict this will result in climate change.

Environmental indicator Physical, chemical, biological or socio-economic measures that can be used to objectively assess the quality and quantity of natural resources and environmental quality.

Erosion The wearing away of the land by running water, rainfall or wind.

Greenhouse gas Gases such as carbon dioxide, methane and nitrous oxide emitted from the energy sector, agricultural activities, forestry and vegetation clearance.

Groundwater Free-moving water found below the surface of the soil; often highly salty.

Hazardous waste Waste that poses a risk to human or ecological health and requires special disposal techniques to make it harmless or less dangerous.

Heritage Agreement A voluntary, legal contract between a private landholder and the State Government to ensure the conservation of biodiversity and wildlife habitat on an area of privately owned land.

Introduced species An animal or plant that does not occur naturally within Australia.

Kyoto Protocol An agreement signed by developed countries in 1997 to accept greenhouse gas emissions targets. Australia signed the Protocol in April 1998 but has not yet ratified it or legally accepted it.

Mangroves A type of plant that occurs in the narrow zone between the land and the sea called the intertidal zone. Mangroves provide important habitat and nursery areas for many marine species.

Monitoring The routine counting, testing or measuring of environmental factors or living organisms to determine their status or condition.

Ozone A gas with molecules comprising three atoms of Oxygen (O₃). It occurs naturally in the upper atmosphere and provides a protective layer shielding the earth from ultraviolet radiation. Ozone in the stratosphere is distinct from ground-level ozone. At ground level, ozone is an air pollutant and contributes to smog.

Particulate matter Particles or very small pieces of solid or liquid matter, such as soot, dust, smoke or mist.

Salinity The amount of dissolved salts in a unit of water. It can be measured in parts per hundred (%), parts per thousand, milligrams per litre or in units of electrical conductivity (EC).

Renewable resources Resources that, when used, can be replaced within a reasonable time frame by natural processes.

Re-use Any process where the waste from one activity is used beneficially for another use or activity.

Seagrass Flowering plant adapted to living submerged in seawater; not a true grass but has a grass-like form. Provides important habitat for marine animals.

Site contamination The condition of land or water where any chemical substance or waste has been added at above background levels and represents a potential risk to human health and the environment.

Species A population of plants or animals that is able to interbreed to produce fertile offspring.

Stormwater Precipitation (e.g. rain), which runs off hard surfaces such as roads, yards and roofs into the stormwater system. Stormwater picks up silt and other pollutants as it runs over these surfaces. It is then piped/runs untreated into watercourses and the marine environment.

Stratosphere The region of the earth's atmosphere 15-50 kilometres above the ground surface where the temperature changes little or increases with height.

Threatened A conservation status assigned to a species whose future survival is potentially jeopardised by human activities or naturally occurring events.

Treated wastewater Sewage that has been treated to remove most solids rendering the final product 99.9% water.

Waste Any discarded, surplus or abandoned matter which, if discharged to the environment, can cause pollution.

Wetland Swamps, billabongs, lakes, saltmarshes, mudflats, mangrove forests and virtually any land that is regularly or intermittently inundated with water that is static, flowing, fresh, brackish or salty, including sea water.



We, as the custodians of our continent, owe a duty to our community, to our environment, to the world and to the future, to achieve a sustainable Australia. To the extent that we fail to discharge that duty, we risk being justly condemned by future generations as vandals of our own time and despoilers of theirs.

Sir William Deane, in support of the launch of
"Natural Advantage: A Blueprint for a Sustainable Australia" October 2000



For further information please contact:

Information Officer
Environment Protection Authority
GPO Box 2607
Adelaide SA 5001
Telephone (08) 8204 2004
Facsimile (08) 8204 9393
Free call 1800 623 445 (country)
Web site: www.environment.sa.gov.au/soe2003



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