



# Conserving Adelaide's Biodiversity

## What it means for Teachers

**Changes are needed in the way we think, act and make decisions in order to conserve South Australia's biodiversity. We all have a part to play in protecting our natural biodiversity.**

The Adelaide region's bushland, coastal and watercourse environments are characterised by a unique assemblage of plants and animals. Having evolved over thousands of years they are specially adapted to the local climate, soil and water conditions. They provide the biological stability that sustains the region's natural resources.

The Kurna, the indigenous people of the Adelaide region, managed this unique environment for thousands of years prior to European settlement. Descendants of the Kurna people still live in the Adelaide area.

### What is biodiversity?

Let's consider what we mean by biodiversity. Biodiversity (or biological diversity) is the variety of all forms of life - the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part.

This means that conserving biodiversity is more than just protecting native flora and fauna. By saving species, their genes and the ecosystems in which they have evolved, we are maintaining ecological benefits that have often gone unrecognised (and unpaid for).



Southern Brown Bandicoot  
(*Isodon obesulus obesulus*)

Natural ecosystems also collectively maintain soil structure, and reduce the risk of soil erosion.

Few of the services provided by natural ecosystems have been quantified economically anywhere in the world, including South Australia. However, it has long been recognised that intact natural ecosystems are efficient and effective in what they do, including:

- purification of air and water,
- moderation of floods and droughts,
- decomposition of wastes,
- generation and renewal of soil and soil fertility,
- pollination of native species,
- control of potential agricultural pests,
- dispersal of seeds,
- recycling of nutrients,
- protection from the sun's ultraviolet rays,
- partial stabilisation of climate,
- moderation of temperature extremes and the forces of winds and waves,
- support for diverse human cultures,
- providing aesthetic beauty and intellectual stimulation that lift the human spirit.

Australia is committed to the conservation of its own unique native biodiversity, the sustainable use and management of its natural ecosystems and the equitable sharing of genetic resources.

In the foreseeable future, sustainable management of the environment will be one of the greatest challenges confronting the world. Loss of biodiversity is only one of the environmental threats that has led to a global response. At the Earth Summit in 1992, 150 nations including Australia, endorsed 'Agenda 21'. In it, world leaders asserted that:

'... education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues.... It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making.'

Key changes are needed in the way we think, act and make decisions in order to conserve South Australia's biodiversity for the benefit of future generations, while meeting the needs of South Australians today. Teaching and learning about biodiversity and its importance is essential if we as a community are to effectively conserve it.

## What this means for you as a teacher

The most appropriate focus for the study and protection of biodiversity is a bioregion. This term combines life (bios) and territory (region or area of study). Bioregional strategies refer to the restoration of the earth's natural plant and animal diversity within a regional framework, and encompass the cultural and social adaptations necessary to achieve bioregional goals. Ecology, language studies, poetry, Aboriginal studies, art in all its forms, society and environment, environmental education and cultural history are all tools to be used in bioregional studies.

All teachers can help develop in students a 'sense of place' in relation to their bioregion; where they live, go to school and play.

It means appreciating Adelaide's pre-European landscapes, understanding their current state, and then developing in students a 'sense of place' that will motivate them to protect and restore Adelaide's diverse natural areas. If students understand environmental responsibilities and take on projects, our environment can only benefit.

## Adelaide in 1836

According to early reports, there were kangaroos in Victoria Square and bilbies and platypus in and along the River Torrens. Native lilies and orchids flowered in the streets of Adelaide and dingoes were often heard in the distance.

In and around Adelaide there were 21 different vegetation associations ranging from open forests and woodlands along South Road at Black Forest to shrublands at Marino. Travelling from Glenelg to the city took several hours, and was made difficult by the numerous swamps and creeks that had to be crossed. Near where Football Park now stands were reed beds where black swans, ducks, ibis, herons and spoonbills flocked. In spring six different frog species could be heard croaking in the shallow wetlands and numerous native fish and yabbies occurred in Adelaide's creeks and rivers.

Native species were spread continuously across the whole region, ensuring that native plants were pollinated, soil kept in place, water ebbed and flowed in seasonal patterns, and various species were kept from becoming over-abundant.

## What remains today

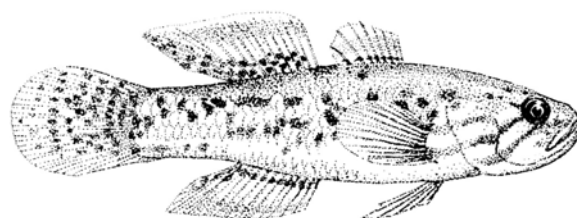
Today only 2% of the Adelaide Plains' original vegetation cover is left. Of the 725 native plant species of the region, 140 (19%) are locally extinct and another 393 (54%) are rare or threatened. In many cases their place has been taken by introduced species.

Our suburbs, factories and roads cover what was once extensive native grassland and woodlands capable of feeding large numbers of native mammals and birds. Much of our present urban biodiversity is made up of introduced species.

Of the 22 mammal species once found in the Adelaide region, one is extinct and 18 are locally extinct. Our unique native marsupials and rodents have been replaced by dogs, cats, hares, horses, goats, mice, rats and foxes.

The large flocks of waterfowl that once took to the air have long since disappeared. Of the 229 species of birds once recorded, 12 are now extinct and 9 others have such low numbers that they will probably not survive locally.

Apart from birds, indigenous wildlife is uncommon in our suburbs. At night, brush-tailed possums are still out looking for food, while the mournful hoot of a lone Morepork (or Boobook owl) frequently goes unanswered. Blue-tongued and shingle-back lizards, geckos, and the occasional snake, have adapted to suburban life.



Southern purple-spotted Gudgeon  
(*Mogurnda adspersa*)

Our creeks and rivers no longer rise and fall in response to natural runoff; they have become storm and wastewater drains. No longer do they contain the diversity of native fish and frogs of the past. The few survivors are supplemented by introduced species like carp and trout.

Since the arrival of Europeans, Adelaide's natural biodiversity has not only been reduced and fragmented; it has also been invaded by many hundreds of introduced species. Huge areas of what was native bush are now covered with ornamental trees, shrubs and lawn. Other areas have been cleared for agricultural and industrial use. This invasion has been so extensive that the biodiversity

with which we are now familiar bears little or no resemblance to the natural biodiversity that was here two hundred years ago.

Many of the introduced species are the very resources on which we have come to depend on for food and fibre and are the basis of much of our economy. This means that we are going to have to change the way we think, act and make decisions if we are to meet the needs of Australians today as well as conserve our natural biodiversity for the benefit of future generations.

## Establishing a balance

Over the past 200 hundred years or so, the prevailing view has been that because native species and ecosystems do not provide for our basic needs we have the right to clear them and replace them with more desirable introduced species. The only justification for our actions is that we knew more about the husbandry of the introduced species than the ones that were already here.

Our community has invested far more time developing farming and recreational practices based on introduced species than in finding ways of using the species and ecosystems already here. For example, more time has been spent in cultivating introduced grasses and ornamental plants than in breeding and selecting native species such as Sturt's desert pea for use in parks and gardens. Even species like Western Australian eucalypts and eastern Australian wattles are preferred to the local species.

More important than the use of introduced species to meet basic needs and recreational opportunities has been the accompanying clearance and fragmentation of natural habitat in the Adelaide region to make way for present-day horticulture, outdoor recreation facilities and the burgeoning urban area. Whatever the merits and mistakes of the past, natural biodiversity now needs room if it is to survive and contribute to the future.

The remaining fragmented remnants of native vegetation are tiny 'islands' surrounded by a large 'sea' of changed landscapes. To restore a more reasonable balance between the natural and the cleared areas it is imperative that areas are reclaimed for natural biodiversity. This will entail restoring or enlarging remnant areas, revegetating cleared areas, joining remnants by establishing corridors of native vegetation, or creating 'buffers' to protect remnant bushland.

The basic underlying question for bioregional studies is: **what information do I need to know in order to live responsibly (ecologically) and appropriately (sustainably) in this place?**

To understand biodiversity and its importance at the bioregional level, students need to comprehend and use such concepts as: native, endemic and introduced species, food chains and food webs, habitats, vegetation, watersheds, bioregions, ecosystems, extinct, endangered, vulnerable and threatened, National Parks, Heritage Agreements, island biogeography, and wildlife corridors.

To come to an understanding of the idea of ecologically sustainable development (ESD) students could investigate the Kurna people's traditional way of life in regards to sustainability. They could consider how development could proceed that is both ecological and sustainable in the region for the long term.

## What you can do

### Education of self and others

Continue learning about biodiversity conservation and ESD practices by consulting the *Adelaide Biodiversity Bibliography* available from the UFBP website: [www.urbanforest.on.net](http://www.urbanforest.on.net).

Include one or more of these concepts in any unit of teaching, and create at least one unit or topic each year that deals with the local bioregion. Primary teachers can access a copy of *Biowhat? The starter kit for Primary Schools* from the UFBP and all teachers can learn from *Conserving Adelaide's Biodiversity: Resources*.

Educate students about local biodiversity; what it is, why it is important and how to take action to preserve, restore and enhance it. Encourage students to appreciate indigenous culture's traditional relationship to the land and other species. Empower your class to participate in protecting and restoring your region's biodiversity by taking on a project. Through the SA Urban Forests – Million Trees Program's *Grow a Great School* initiative, funding is available to schools for biodiversity projects such as revegetation or restoration works.

Provide information to others, and training for students at the same time, by speaking at assemblies, staff and school council meetings, or writing an article for the school newsletter about local species and ecosystems.

### **Taking Action: within the school**

- Make an inventory of the natural biodiversity that already exists within the school environment.
- Create a living classroom for studies in Environmental Education, Science, Natural History or Ecology.
- Retain local plant species in school grounds for shade, aesthetics, reduced energy consumption and as natural habitat.
- If revegetating, be sure to source local provenance seed.
- Replace 10% of lawned areas with a natural understorey of local shrubs and grasses.

### **Taking Action: within the community**

- Work with your local council or other stakeholders to monitor, safeguard and restore the natural biodiversity of the region.
- Replicate isolated remnants of local native bush in nearby parks.
- Grow and supply native plants for the local council or other schools in the region for local revegetation work.

For all actions, make one or more connections with community groups that can assist you, e.g. UFBP for relevant information on biodiversity, Australian Plants Society (formerly Society for Growing Australian Plants) and Bushcare for plant species information and how to grow them, or Threatened Species Network (SA) for information relating to local threatened species and other groups to contact.

## **Further reading**

Dashorst, G.R.M. and Jessop, J.P. 1990, *Plants of the Adelaide Plains and Hills*, The Botanic Gardens of Adelaide, Adelaide.

Kraehenbuehl, D.N. 1996, *Pre-European Vegetation of Adelaide*, Nature Conservation Society of South Australia Inc., Adelaide.

Prescott, A.M. 1988, *It's Blue with Five Petals*, The Author, Adelaide.

Robertson, M. 1994, *Stop Bushland Weeds*, Nature Conservation Society of South Australia Inc., Adelaide.

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