



Listening to our birds and...

# Answering The Call



**A Whole School Approach To Sustainability  
K-6 Environmental Education Resource**



**Birds Australia**  
CONSERVATION THROUGH KNOWLEDGE

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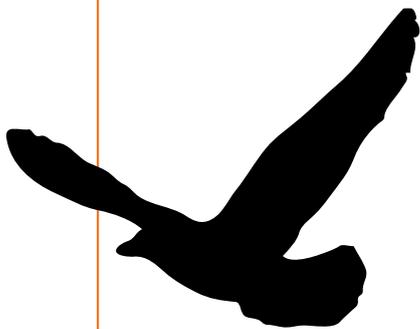
# Acknowledgements

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## Note:

**Answering the Call** is currently formatted and referenced for New South Wales Schools. The NSW Curriculum links are included in this version of the resource and these will be updated to match the Australian National Curriculum in 2011.



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# Curriculum Context

## Answering the Call Provides Students with a Context for Learning About Sustainability

### Definition of Sustainability:

*Meeting the needs of today without compromising the needs of tomorrow*

### Definition of Education for Sustainability:

*The role of education in engaging and equipping people for change*

## Introduction

**Answering the Call** provides students with a context for learning about sustainability. The issues facing Australians today including increased population growth, climate change and food security are complex and challenging. Students need new skills for the future to manage these challenges as outlined in the Sustainability Curriculum Framework. *“Learning to take action that will result in people being more sustainable is the central learning goal of the framework”.*

## Sustainability Curriculum Framework

The concepts outlined in *Sustainability Curriculum Framework - A Guide for Curriculum Developers and Policy Makers* Department of Environment Water Heritage and the Arts 2010 provides a progression of learning from Kindergarten to Year 10 in the form of 3 organisers: Knowledge of Ecological and Human Systems, Repertoires of Practice and Sustainability Action Process. These organisers are interdependent and over-lapping, none is sufficient on its own.

Figure 1: Sustainability Curriculum Framework Organisers





## Sustainability Curriculum Frameworks - Organiser Knowledge and Practices



### Knowledge of ecological and human systems

- **ecological systems** involves knowledge associated with the processes and interactions of living and physical systems that support the functioning of the Earth's biosphere
- **human systems** - involves knowledge associated with social, cultural, political, economic and technological systems, structures, beliefs and actions that impact upon the functioning of the Earth's biosphere and influence the capacity for people, both individually and collectively to live sustainably

### Repertoires of Practice

- **world viewing** - involves practices associated with reflecting on, comprehending, negotiating and changing fundamental beliefs, perceptual orientations, ethical principles and values
- **systems thinking** - involves practices associated with comprehending and working rationally with complexity, uncertainty and risk, so that they can be managed effectively
- **futures and design thinking** - involves practices associated with visualising, modelling, selecting and developing ideas, products, environments, processes and systems that contribute to preferred futures with the aim of formulating viable solutions

### Sustainability Action Process

- **making a case for change** - exploring a sustainability issue, assessing the current situation, investigating sustainability concepts and ideas and stating a case for change
- **defining the scope for action** - exploring options for making a change, identifying available resource and constraints, seeking consensus and developing a statement of agreed direction for action
- **developing a proposal for action** - generating and selecting ideas, developing and modifying these to make them ready for implementation and preparing communicating and agreeing upon the proposal
- **implementing the proposal** - turning the proposal into action
- **evaluating and reflecting** - assessing the degree of success of the action and the efficiency of the processes used, identifying possible future directions and the learning that resulted from the action



## Specifically ‘Answering the Call’ Meets the Sustainability Curriculum Framework by:

- Encouraging students to collect data by conducting *Bird Surveys* from Early Stage 1 through to Stage 3. Through interpreting the students individual observations of their local environment and by examining the *Birds as Indicators Case Studies* this will build skills and **Knowledge of Ecological and Human Systems**.
- Assisting students to form an emotional connection and an ethical response to their local environment through adopting a “Special Place” - an ecosystem to draw long term conclusions from and a long term relationship with. An *Attitude and Action Inventory* and a series of *Moral Dilemmas* provides an opportunity for building **Repertoires of Practice** by investigating issues from multiple perspectives and recognising how their own beliefs and practices contribute to building a sustainable future.
- Equipping students with the capacity to make decisions and take action in response to their observations through a *School Parliament* and **Sustainability Action Processes**.

## Answering the Call also meets the Australian Sustainable Schools Initiative (AuSSI)

*The title of this unit, Answering the Call indicates that this program takes its theme from the message – or call – of nature.* It specifically encourages schools to begin by observing the bird life in and around the school. Through monitoring birds and recording the data on the Birds in Backyards website ‘**Answering the Call**’ also links closely to the Australian Sustainable Schools Initiative (AuSSI) by linking an icon or indicator bird species to the School Environmental Management Plan (SEMP). This program will help schools to achieve immediate, measurable improvement in the management of resources and management of the school grounds.

AuSSI aims to achieve the following:

1. Learning and teaching for sustainability as an integral part of school curricula
2. Schools actively engaging in a continuous cycle of planning, implementing and reviewing their approach to sustainability as part of their everyday operations
3. Schools using natural resources, including energy, water, waste and biodiversity in a more sustainable ways
4. Schools and school authorities reporting on changes towards sustainability
5. Schools working towards sustainability in partnership with their local communities.

Source: [environment.gov.au/education/aussi](http://environment.gov.au/education/aussi)

As with AuSSI the ‘**Answering the Call**’ program encourages a whole school approach to sustainability.



# How to Teach 'Answering the Call'

**This Resource is a K-6 progression to form a whole school approach to sustainability.**

We recommend that schools apply the program jointly with other schools in their area (in clusters to build communities of practice). This will allow schools to share resources with each other including access to in-school support from mentors as well as obtaining joint funding to support actions. Please refer to **Additional Resources - Where to Find Support for the Program**

## In brief this program allows students to:

- Observe, measure and record information about birds
- Analyse and scope local environmental issues
- Develop strategies to manage their chosen ecosystem and take action

The program is flexible and could be taught as a single unit or as a Gifted and Talented Program however for the best results we encourage schools to adopt the whole program from Kindergarten. Sustainability concepts are BIG and by implementing this program over time it will allow teachers to track the progression and support the gradual development of life skills for the students. The intention of the units is to provide enough detail for the classroom teacher to closely follow the activities, or to simply get the feel of the unit and modify it to meet the needs of the students. Such modification may need some communication with fellow teachers to ensure that the program flows well from Early Stage 1 to Stage 3. The program is learner-driven in that at the most basic level students observe the world around them (conducting bird surveys) building knowledge about ecological and human systems as a starting point to asking questions. For example: *Why is that bird here? What does that indicate about our environment? How do my/our community's actions impact on our environment?*

However the effectiveness of this program depends on its ability to encourage students to take action for sustainability across their lifetimes. The program is designed to enable students to appreciate change over time and envision futures, create solutions and manage change. It is important for students to be able to articulate their concerns, develop and define actions, implement actions and evaluate and reflect on experiences in an ethical manner. Through this information, students have the opportunity to make a difference and contribute to the School Environmental Management Plan (SEMP) in a meaningful way. They can even enhance the environment of their school.

To successfully engage the students and empower learner-driven action the Stage 3 Units are much more open-ended than the earlier Units. *Current Issues* and *Australian Democracy* require the teacher to negotiate learning processes with the students. It is suggested that outcomes and indicators be used as checklists. As you design the Unit with the students tick off outcomes and indicators as you do them. Those that do not get ticked will require you, as teachers to devise activities for them. This gives you the opportunity to discuss with the students what a curriculum is, how members of the community have expectations of their learning (politicians, employers, the public etc.) and to develop their independence as learners (see Boomer, Garth *Negotiating the Curriculum: Educating the 21st Century*, with Garth Lester, Nancy Onore, Cynthis Cook, Jonathon Isbn 1-85-000931-7).



## Why Birds?

*'Birds are indicators of the environment. If they are in trouble, we know we'll soon be in trouble.'* Roger Tory Peterson

Birds are everywhere and they are relatively easily seen and identified. Most people enjoy them for their beauty, their liveliness or their song. There is also a lot of information available on birds and various websites, organisations and experts who can help.

Ecosystems are usually so complex that no single component can speak for all the others. Nevertheless, birds can give an indication whether the system is healthy or otherwise, and their study can be a useful way to gain an understanding of ecosystems and their needs. This is the reason that the European Economic Union has adopted a farmland bird index as one of their indicators of sustainability.

Birds have also been used as indicators of grassland, wetland, meadow, rainforest and desert health, of environmental hazards, and of changes in other types of biodiversity. Changes in living birds, both individuals and populations, are evidence of climate change and fossil birds have been used to indicate what past climates were like. Bird skins and eggs in museums have shown the history and damage caused by some pollutants, and changes in the timing of events in birds lives or in the places birds occur point to environmental change. The possibilities are endless. Please refer to the **Additional Resources - Birds as Indicators Case Studies** for more detailed examples of how birds can indicate the health of the environment.

## What is an Ecosystem?

*An ecosystem is a biological community that occurs in the same locality. It might be a pond, a grassland, a woodland, or a seashore. Even a single shrub, or a school wall, is a mini-ecosystem.*

An ecosystem includes living (plants, animals and micro-organisms) and non-living (sunshine, precipitation, temperature, soil or water chemistry) components. The elements contribute to the integrity of the food chain, reproductive rates, the energy flow through the system and genetic variation and stability (or lack of stability; some ecosystems are naturally unstable). The components interact and everything has its place.

Birds, for example, are animals that can fill several roles in the ecosystem: Some are meat-eaters—carnivores, piscivores or insectivores; some are plant-eaters that may feed on nectar, flowers, buds, leaves, grass, grass-seeds or any combination. Some birds eat carrion; some are important for turning the litter as they look for insects and some for pollinating plants they visit. Some are specialists in their habitat and/or food requirements; others are generalists. All living and non-living elements of an ecosystem provide insight into the state of the ecosystem they live in.



## What is Biodiversity?

*“Biodiversity is the variety of all life forms on earth – the different plants, animals and micro-organisms and the ecosystems of which they are a part”.*

There are several definitions of biodiversity. The most comprehensive definitions encompass genes, species and ecosystems: the three levels of biological organisation that together create the complexity of life on earth. Biodiversity is protected by law in Australia. Birds are part of our biodiversity and for more information about how they are protected please refer to **Additional Resources - How are Australian Birds Protected by Law?**

Australia has high biodiversity with more than twice the number of species that occur in Europe and North America. We have a responsibility to protect that biodiversity and to ensure that the total biodiversity of the earth is not diminished. Every species that is lost is a permanent loss to the earth's biodiversity. People need the resources biodiversity provides for food, medicines, clothing and shelter. Biodiversity is vital for current and future human wellbeing.

Although the adage 'more is better' applies to the earth, any particular region may have naturally high or low biodiversity. Places like rainforests and reefs have high biodiversity whereas a salt-flat or certain deserts have low biodiversity. Thus, within a particular region, low biodiversity may not be a sign that something is wrong. **What is important is discovering the biodiversity where you live. Is it high or low? Has it changed over the years? How can you help protect the biodiversity that is special to your local area?**

For more information about Australian birds see [www.birdaustralia.com.au](http://www.birdaustralia.com.au) and for birds of the world see [www.birdlife.org](http://www.birdlife.org)

*What is important is discovering the biodiversity where you live. Is it high or low? Has it changed over the years? How can you help protect the biodiversity that is special to your local area?*





# Where Do We Start?

**Starting this program is easy! The first thing to do is to take the students outdoors and begin observing the birds in and around your school.**

## The Critical Importance Of Data - Log Book

Collection of data is important because it helps us to understand ecosystems and to articulate our response clearly.

Students are encouraged to keep a Log Book from Kindergarten to Year 6 to record observations in the field. The logs will probably be most used in the class “Special Place”, but may also be handy on excursions. The key issue here is to constantly remind students that all responses to the environment should be based on accurate observation. Please refer to **Additional Resources - Bird Data Case Study** to find out how the data collected can be used by your school.

## Bird Survey

In this program, birds will be studied as the primary indicator of the health of an ecosystem(s) chosen for study. Birds’ numbers or their variety (sometimes together called biodiversity), and their behaviour, can all be useful information. Because a bird’s daily routine may see it moving across a large area, the presence/absence of birds, as well as their behaviour, can provide information not only about the local ecosystem(s), but about issues that are occurring far away (e.g., the present high numbers of ibis on the east coast of Australia are due to the drought in the western areas of QLD, NSW and VIC. An observation of ibis at school has a very wide message about current ecological and meteorological issues, which students can engage with at their own level).

We strongly encourage schools to enter the bird monitoring data on the Birds in Backyards (BIBY) website. We have an easy to use survey proforma for data entry. Birds Australia can also provide schools with raw data for the students to analyse or for a fee Birds Australia can analyse the data collected for you. Please refer to **Additional Resources - Where to Find Support for the Program**

## Birds Eye View of the School

One of the best ways to use birds as the starting point for investigating sustainability can be as simple as asking the students to imagine they are a bird flying over the school – What do you see? We recommend that students examine an aerial photo of the school and surrounding landscape using [earth.google.com](http://earth.google.com) or [maps.google.com.au](http://maps.google.com.au)

This tool can help students to view the surrounding land uses, natural areas and built areas. It can also help them to understand fragmentation of habitat, loss of biodiversity and sustainable use of resources (what materials have been used in the landscape surrounding the school? Where do they come from?).

**The Birds in Backyards website <http://birdsinyourbackyards.net/> provides students and teachers with an easy to use bird finder/identification tool, bird facts and information and online data entry for surveys of your “Special Place”. Data collected is utilised by researchers to learn more about our environment and is available for students and teachers to analyse to support decision making in the school.**



## Stage Theme: Bird Survey

Early Stage 1	Introduction to bird calls and songs.
	Observations of birds recorded in a picture graph.
Stage 1	Tallying introduced
	Scientific names of 3 birds
	Survey includes other elements such as bugs, lizards, humans as well as non-living elements such as soil, air and water
	Bird expert could visit the classroom
	Comparison of different areas
	Dependency on the environment
Stage 2	Bird survey on different sites
	Comparison of sites and differences
Stage 3	Data collection and interpretation
	Overall picture of how the elements are functioning together

## Emotional Connection And Ethical Response

Collection of biological information will give students an understanding of the ecosystem and some of its components and needs.

A critical part of *Answering the Call* is the opportunity for students to develop:

- An emotional connection to the ecosystems they study; and
- An ethical response through the *Attitude and Action Inventory*, *Moral Dilemmas* and *School Parliament*

### An Emotional Connection - Our 'Special Place'

In the Early Stage 1 unit, students have the opportunity to locate a 'Special Place', an ecosystem which will remain their focal location for the remainder of the program until Year 6. While excursions will take them further afield, they will return to their 'Special Place' regularly so they can track changes and draw long-term conclusions from their recordings. An ongoing relationship with their 'Special Place' also provides the possibility of developing an emotional attachment to this place.

The 'Special Place' needs to be easily accessible because the students will potentially use it over a 7 year period. Also, it needs to be an area with an active bird population. While a local bushland or wetland may be ideal, particular birds may be often seen in a small garden or the schoolyard. It would be best to choose a site where birds are obvious or plentiful to maintain interest. If you feel that you lack such a site, classes could undertake to create "*bird friendly spaces*" <http://birdsinyourbackyards.net/spaces/> by planting bird attracting plants and providing water (bird bath or pond).



## StageTheme: Our 'Special Place'

Early Stage 1	The 'Special Place' is first visited
Stage 1	Connecting 'Special Place' with other elements of the natural and built environment
Stage 2	Assessing impacts on the environment of the students' 'Special Place' and other relevant locations they visit or study
Stage 3	Discussing a moral dilemma over our 'Special Place' or other significant site

## 'Special Icon'

It could be argued that children are increasingly forming emotional attachments to their mobile phones, their Wiis the TV, and so on, while opportunities to be connected to the outside world are diminishing. Critical to the program is the provision of opportunities for students to experience an emotional connection with the natural environment.

To foster this emotional experience, activities have been provided in which students 'receive' their own special icon' similar to a Totem or Token. Each student will be given an icon in Kindergarten. This may be a bird or other animal, plant or a non-living element of the 'Special Place'. It will become the child's responsibility to look after their icon and help it to persist in the 'Special Place', that is, help it to be sustainable. The students could, of course, be involved in choosing their own icon and could also celebrate the handing down of icons through a peer support or mentoring program with older students sharing their icons with younger students when they leave school. The following table outlines the progression of work with icons from Early Stage 1 to Stage 3.

## StageTheme: Special Icon

Early Stage 1	After becoming familiar with the 'Special Place', each student accepts the gift of their 'special icon' from their teacher
Stage 1	Students: <ul style="list-style-type: none"> <li>• Discuss the role/importance of their icon in the ecosystem</li> <li>• Plan for the future protection of their icon</li> <li>• Spend some silent time with their icon</li> </ul>
Stage 2	Students: <ul style="list-style-type: none"> <li>• Devise a process of measurement of their 'icon' to check on its health</li> <li>• Conduct this process of measurement of their 'icon' and record their results</li> <li>• Plan for the future protection of their totem by carrying out these plans</li> </ul>
Stage 3	Students: <ul style="list-style-type: none"> <li>• Spend some silent time with your icon</li> <li>• Write a fictional work on their icon. Some possible topics are: <ul style="list-style-type: none"> <li>• 'What My Special Icon has seen' (in its lifetime)</li> <li>• 'I sat for a long time with My Special Icon</li> <li>• The silence grew. Then, it was as if it spoke to me...'</li> <li>• 'My Special Icon needs/likes/dislikes...'</li> </ul> </li> <li>• Continue to implement your plans to protect their icon</li> </ul>





## Ethical Response - Attitude And Action Inventory and Moral Dilemmas

A series of moral dilemmas are provided at each year level. These are based loosely on Lawrence Kohlberg's levels of moral development (W.C. Crain. (1985). *Theories of Development*. Prentice-Hall. pp. 118-136). They provide the possibility of filing responses for students each year at the end of the unit to provide a K to 6 profile of ethical development. Through investigating a moral dilemma about a locally relevant site it provides students with an opportunity for critical thinking and reflection and a structured starting point for building repertoires of practice.

The moral dilemmas presented may not be suitable to your location as they should be site-specific. There are many sources of information other than those presented to find moral dilemmas, for example the local newspaper, World Wildlife Fund or Act4Nature websites.

### Moral Dilemmas

There are 3 moral dilemmas in the program as indicated below. With these moral dilemmas it is intended to generate thoughtful discussion amongst the students. It is not intended to put down one point of view over another. Environmental needs, economic needs and social needs should all be valued, but can be prioritised.

#### 1. Moral Dilemma: Ibis In The Playground

This dilemma is intended to be used at any time throughout Early Stage 1 and Stage 1 and can be used more than once providing the students do not become too familiar with it.

*Many Australian White Ibis have moved into a school to feed on bugs in the soil on the oval. The birds also eat any leftover food from the students once recess and lunch have finished. The problem is that sometimes they come up to the students while they are still eating and try to steal food. Some children are frightened by the Ibis. The Ibis are at the school because their normal homes are in drought and have had almost no rain for many years. They have come to the area around the school in order to live and to find water while their home is very dry.*

Should we protect the Ibis while their home is so dry? What could we do to help protect them? Should the school try to get rid of the Ibis, or leave them there? How would you get rid of them? What would this do to the Ibis? If a child is frightened, what should they be allowed to do?

Careful observations and collection of data can help to answer some of these questions. What sort of information would you collect? Sometimes observation shows that there is not really a problem at all, or that it is different than initially thought. Once the real problem has been identified, weighing up the pros and cons of possible solutions, considering the environmental, social and economic implications of decisions is important. Environmental values of birds include provision of ecosystem services such as; pest/insect control, seed dispersal, pollination etc. (e.g. How do Ibis fit in the ecosystem?). Social values of birds might include inspiration for art, literature, music (e.g. What impact are the Ibis having on student fear and safety versus enjoyment of the birds?). Economic aspects might include the cost of management to conserve the original habitat of the birds (e.g. What is the cost of removal/non-removal?).





## 2. Moral Dilemma: Mining In The Park Stage 2

### Introductory Note

The following moral dilemma is written specifically for the unit *Australia: You're Standing in It*.

- To gain a strong reaction, the dilemma can be presented as fact. In the role of teacher, you can elicit responses before telling the class that this is not really happening, but was intended to evoke genuine feelings about the use of the environment.
- However, if you feel this is inappropriate for your class, explaining from the outset that it is only a story may be a better approach.

*There are new plans for a natural site you have visited on excursion. Valuable minerals have been found and the government has agreed to mining in the area. This will create many jobs and money for Australians. However, the waterways may be damaged, and some animals and plants will need to be removed or may no longer be able to visit the area to feed or breed. Some may die. Some scientists have said that this work can be done with little damage to the environment, while others say the park will never be the same, with plants and animals dying out in some areas and waterways becoming polluted.*

### What will you do?

Decide that you are not interested and let others decide what will happen? Express your opinion (to the government, to the media, to the company)? What would your opinion be? Find out more information before you decide what to do? How could you find out more information? What else could you do?

## 3. Moral Dilemma: Current Issues

As this comprises the whole unit, it is not reprinted here.



## Decision Making and Action

### School Parliament

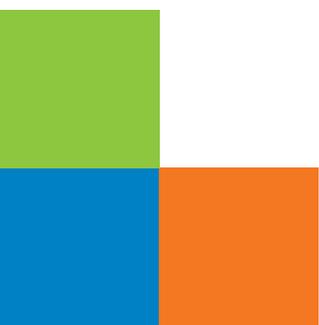
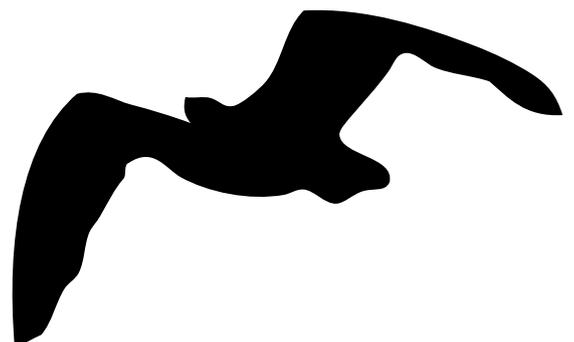
The K-6 progression of this program requires a developing ability for decision-making and action by the students. The Stage 3 units rely on formal meetings to process decisions regarding effective and ethical action regarding sustainability. As a starting point, the development of circle discussions (or any appropriate variation), where students are able to state their own opinion and be heard by the whole class would be a powerful way to lay the foundations of ethical action later. The choice of which place will become Our 'Special Place' would be a great way to start.

The School Parliament Unit provides opportunity for students to explore, observe, describe, review information reports and procedures. The focus of the Unit is on developing the students as leaders and it is critically important that the students participate in the decision making process and are directly involved in the action to be taken.

Stage	Theme: Decision Making
Early Stage 1	Class Circle introduced
Stage 1	Teacher modifies the class circle to suit the abilities of the students
Stage 2	The teacher could introduce a formal structure to the Class Circle by looking at the Parliamentary Education Office's website ( <a href="http://www.peo.gov.au/teachers/diy.html">http://www.peo.gov.au/teachers/diy.html</a> ) and modifying one of the scripts provided, or by creating a procedure
Stage 3	Surveys used to: <ul style="list-style-type: none"> <li>• prompt student action</li> <li>• investigate patterns in Bird Surveys since the class first began</li> <li>• to take them</li> </ul> Class Parliament (based on the Parliamentary Education Office website, as above)

### Birds as Indicators Case Studies

The Additional Resources section contains a series of Case Studies outlining some specific examples of birds indicating change in the environment including environmental pollution, habitat alteration, ecosystem breakdown and regenerating landscapes. There are a series of Focus Questions included in the Case Studies to prompt students to think about their role in the environment, the use of natural resources and the implications to the environment. The Case Studies also contain literature and references for both students and teachers as well as suggest some simple Actions schools can take to respond sustainably following their own exploration of birds in the local environment.





# Teaching Units

1. Early Stage 1
2. Stage 1
3. Stage 2
4. Stage 3



# Places We Know

This unit provides opportunities for students to explore the immediate environment, which will include the school or classroom, highlighting ecological sustainability in the care of places. The unit emphasises the skill of recording information gathered through direct observation. It focuses on the differences between familiar features and places, and between the activities that occur there.



EARLY STAGE 1			
CORE OUTCOMES HSIE	<p><b>ENES1</b> Gathers information about natural and built environments and communicates some of the ways in which they interact with, and can care for, these environments</p>	INDICATORS	<ul style="list-style-type: none"> <li>identifies activities that occur in specific places</li> <li>talks about the features and location of their school (especially the playground).</li> <li>matches features in photographs, pictures, books and models to those seen in their environment</li> <li>demonstrates an awareness of flat and sloping places</li> <li>uses and makes 3D models of environmental features</li> <li>names and talks about places and features in their home, school and local area</li> <li>describes places that they view as special</li> <li>uses a variety of senses to gather information about their environment</li> <li>uses everyday vocabulary associated with understanding location, position and place, eg up, down, over, under, near, far</li> <li>demonstrates ways in which they can care for their home, classroom, school and local community</li> <li>demonstrates an awareness that the world extends beyond their immediate environment.</li> </ul>
	<p><b>SSES1</b> Identifies ways in which their own needs and the needs of others are met, individually and cooperatively</p>		<ul style="list-style-type: none"> <li>identifies their own needs and the needs of others</li> <li>demonstrates ways in which they can take responsibility for meeting their own needs</li> <li>makes connections between personal and class needs and people who meet these needs, including peers and adults in the school.</li> </ul>
EMBEDDED SCIENCE OUTCOME	<p><b>LT ES1.3</b> Identifies ways in which living things are different and have different needs.</p>		<ul style="list-style-type: none"> <li>sorts pictures into groups of living and non-living things</li> <li>identifies the different parts of animals that help them to observe, eg eyes, nose</li> <li>sorts animal models and/or plant pictures according to differences and similarities, ie in relation to appearance, habitat, movement, food</li> <li>works collaboratively to plan a model garden and describes how different features cater for a range of living things, eg birds, people</li> <li><b>operates a tape recorder to record, play and identify different bird calls</b></li> <li>designs a habitat for a particular animal, following a field excursion, and explains how it suit's the animal's needs</li> <li>uses a magnifying glass to identify and then draw different features of animals such as insects, spiders, snails</li> <li>contributes to a picture graph showing the frequency of a physical characteristic, eg eye colour across a class group.</li> </ul>
LANGUAGE FEATURES	<ul style="list-style-type: none"> <li>This unit provides opportunities for students to explore observations, narratives, descriptions and procedures</li> <li>The HSIE teaching strategies/practices in this unit include mapping, developing charts, and constructing 3D models</li> </ul>		

## ACTIVITIES

### INCURSION/EXCURSION

Incursions and excursion can provide vital links in understanding for students. The focus areas for this experience could be providing expert knowledge in the areas such as sustainability, birds in your local area, human impact in your local area.

#### Note

The K-6 progression of this program requires a developing ability for decision making by the students. The Stage 3 units rely on formal meetings to process decisions regarding effective and ethical action regarding sustainability. As a starting point, the development of circle discussions (or any appropriate variation) where students are able to state their own opinion and be heard by the whole class would be a powerful way to lay the foundations of ethical action later. Generally such discussions are conducted without other students being able to argue back... there is just acceptance of every statement). The choice of *Our Special Place* would be a great way to start. A wall display headed, "Our Circle Decisions" could list the class achievements over the term. This would be a powerful reminder of their achievements and would be an impressive statement to all visitors to the classroom.

### SECTION ONE: PREPARATION

1. The teacher introduces the main idea of the unit by displaying photos taken in the playground of:
  - bugs, birds, lizards, spiders (if these are hard to locate, take photos of where you think they live. Finding them could become a valuable part of the unit).
  - non-living factors such as water, soil and air
  - human behaviourA smart board display would be ideal here.
2. The teacher asks: "Can you tell me:
  - what lives there?
  - what does it need? (water, soil, air)
  - can you group these living things? (grasses, trees, ...)
  - how do we treat these?
  - where things live?
  - if you look for things that move, where they have been in the past? (they may be unseen now).
  - can you see humans?
  - if these humans are caring for this place?
3. A place needs to be chosen which is easily accessible for ongoing observation: part or all of the playground (eg garden beds) or perhaps a nearby forest. This could be chosen in collaboration with the children. The class could call this *Our Special Place*.
4. Class brainstorm (before the first 'field visit'): "What 'natural' activities happen in *Our Special Place*? What 'human' activities happen in this place? This could be drawn or done verbally and could be used as a pretest. **A**

5. Teacher: “This is what we think happens in *Our Special Place*. Let’s go out and see if we are right”. Students observe natural (living and non-living) and human activities. If necessary, the teacher may wish to focus on only one or two elements to observe (eg bird v student numbers).

## SECTION TWO: OBSERVATION SESSIONS IN *OUR SPECIAL PLACE*

This section features a comparison between the needs and wants of birds and humans. However, other living and non-living things could be included if desired.

These observation sessions need not remain confined to this unit, but could be continued throughout the year, being used as context for speaking and writing tasks in English

You may wish to have each student keep a *Log Book* which could be filled in on returning to the class. This could provide assessment information as well as material for display later in the unit.

1. Students examine a basic map of their *Special Place* (The school evacuation plan will provide an outline of the playground). They predict the location of bird/human activity on the map.
2. Shadow figures of birds can be downloaded from the *Birds Australia* website ([www.birdsaustralia.com.au](http://www.birdsaustralia.com.au)). The students could be made familiar with the birds by displaying these shadow figures on a smart board. The map of *Our Special Place* can then be annotated to indicate bird and human locations.
3. Students play Bird Domino where they need to match like figures in order to improve their visual recognition of the birds. See “Resources” in the Appendix
4. Teacher: “It is time for our first class visit to *Our Special Place!*”  
See Appendix 2 for appropriate equipment. The students could observe:
  - birds, bugs, lizards, spiders etc as well as
  - non-living (abiotic) factors such as water, soil and air and
  - human behaviour
  - They may wish to think about animal areas, human areas, shared areas.

Equipment may include:

  - small plastic dishes in which to observe insects,
  - small paint brushes with which to sweep up insects, brush soil, etc
  - magnifying glasses
  - binoculars
5. Teacher explains to the students that they are going to use their senses to observe and record what they find.
6. Students could listen to bird calls on the Birds in Backyards website ([www.birdsinbackyards.net/finder](http://www.birdsinbackyards.net/finder)) in preparation for listening to bird calls in *Our Special Place*. They could repeat this after their visit to check their accuracy.

### SECTION THREE: (AFTER THE OBSERVATION IN *OUR SPECIAL PLACE*) MAKING SENSE OF WHAT WE SAW

1. **Class Circle** discussion:

- a. How did you feel in Our Special Place?
- b. Where did we look?
- c. How do we present information now?
- d. How do we present to other classes?
- e. How do we continue to show responsibility for the environment? (eg storing their audit material for next year to help with comparison)

The class could possibly add to the wall display headed, “Our Circle Decisions”)

2. Students record their observations in words and pictures. Photos could be taken. This work can be displayed. Teacher asks, “Did we see what we thought we’d see in *Our Special Place*?” Students compare their prediction in Step 2 with their observations in Step 3.

3. Students asked

- a. Why is this place special?
- b. how can we care for this *Special Place*?

Students respond verbally. Teacher takes written notes to be displayed on wall.

**IMPORTANT: Responses in this section need to be filed at the end of the unit for the Year 1 teacher to use in the introduction to the S1 units.**

### SECTION FOUR: BIRD SURVEY, IN THE FIELD

This needs to be conducted over multiple short visits to *Our Special Place*.

Refer to the Birds in Back yards website: [www.birdsinbackyards.net/surveys/backyard-birds.cfm](http://www.birdsinbackyards.net/surveys/backyard-birds.cfm)

Teacher examines the survey types proposed on the Birds in Backyards website ([www.birdsinbackyards.net/forms-backyards-birds.cfm](http://www.birdsinbackyards.net/forms-backyards-birds.cfm)).

The three suggested methods are:

- i. *all the birds you observe in your garden\* on a single day, over a fixed 20 minute period between 7 am and 10 am (preferred method)*
- ii. *Keep a list of all the bird species you observe incidentally in your garden\* over a 1-week period*
- iii. *Rely on your memory to recall all the bird species you have observed in your garden\* over the last year.*

### **Suggested model for ES1:**

1. Teacher organises times to suit the class, although the earlier in the day, the better for the birds.
2. Teacher cuts out paper or cardboard shadow figures of local birds to be used for the first observation visit to *Our Special Place*. Figures could have blu tack on the back.
3. During observation visit, students work in small groups helping each other to identify birds/humans.
4. A map of the Special Place might be given to each group to record their results which could be collated onto a single map afterwards.
5. Students paste these onto their map indicating where they observe the birds or humans to form a type of picture graph. Each figure could be made to represent multiples, eg one shadow raven cut-out = 5 ravens. This will depend on the number of birds and humans you are likely to see.
6. Students could record bird calls on tape/digital recorder and, back in class, they could learn their favourite (also using the recoded calls on [www. birdsinbackyards.net/finder](http://www.birdsinbackyards.net/finder)). A class bird calling contest could be held!
7. Data could be recorded for the school's SEMP or on the Birds in Backyards website

### **SECTION FIVE: HOW DOES EVERYTHING CONNECT?**

1. Use the living things you observed in your Special Place to construct a food web. Class discussion; What would happen if one of these living things disappeared?

### **SECTION SIX: HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES?** (*This would include other students, teachers, parents and families, the local community*)

- **Class Circle** Discussions. Students nominate a range of possibilities for their presentations.
- Consider cross age opportunities: Inviting some children from older classes (who are doing a later *Answering the Call* unit) to act as mentors for these presentations. These could include Power points, log books, field visits etc

### **SECTION SEVEN: WHAT WILL WE DO IN THE FUTURE?** (*Ongoing relationship with our special place*)

- Children hold Class Circle discussions, asking “How do we keep caring for our Special Place

On a final visit to the class' Special Place, each child is given one part of the Special Place to care for.

This may be an

- insect,

- a bird,
- a plant,
- a creek etc.

Their item will be referred to as their “totem”. The students commit themselves to care especially for their totem during the years they are at their school. This may require occasional visits back to the Special Place during the year.

**MORAL DILEMMA: *IBIS IN THE PLAYGROUND*      *ES1 & S1***

This dilemma is intended to be used at any time throughout ES1 and S1 and can be used more than once providing the students do not become too familiar with it.

1. At xxx School many Ibis have moved in to feed on bugs in the soil on the oval. They also eat any leftover food from the students once Recess and lunch time have finished. The problem is, sometimes they come up to students while they are still eating and try to steal the food. Some children are frightened of the ibis.

Should the school try to get rid of the ibis, or leave them there? How would you get rid of them? What would this do to the ibis? If a child is frightened, what should they be allowed to do?

2. The Ibis are at the school because their normal homes are in drought... they have had almost no rain for many years. They have come to the area around xxx Rd Primary school in order to live... to find water while their home is very dry.

Should we protect the ibis while their home is so dry? What could we do to help protect them?

## STAGE 1

# The Need for Shelter

This unit provides opportunities for students to explore the need of people and other living things for shelter, and how built and natural environments can provide this, highlighting social justice.

The unit emphasises the skill of synthesising information and making generalisations. It focuses on the students' local area and safety needs in familiar environments.



CORE OUTCOMES HSIE	<b>ENS1.5</b> Compares and contrasts natural and built features in their local area and the ways in which people interact with these features	INDICATORS	<ul style="list-style-type: none"> <li>examines the differences between natural and built features and sites</li> <li>identifies similarities and differences between natural features and sites in their local area and those in other areas</li> <li>describes and categorises places in their local area</li> <li>uses a range of geographical terms to describe location and features</li> <li>associates geographic terms for places and features with visual images</li> <li>examines the values that people place on natural and built features and places</li> <li>expresses feelings for particular environments and why they have these feelings.</li> </ul>
	<b>ENS1.6</b> Demonstrates an understanding of the relationship between environments and people.		<ul style="list-style-type: none"> <li>identifies ways in which people depend on the environment</li> <li>identifies ways in which people's interactions with the environment can change that environment</li> <li>evaluates results of human change on environments relevant to them</li> <li>describes interactions with the environment that can affect their life or the lives of others</li> <li>identifies ways that places in their immediate environment have changed and are continuing to change</li> <li>participates in activities that demonstrate personal and shared responsibilities about the care of environments</li> <li>recognises that Aboriginal peoples have interacted positively with the environment for a long time.</li> </ul>
<b>EMBEDDED SCIENCE OUTCOME</b>	<b>LT S1.3</b> Identifies and describes ways living things grow and change.		<ul style="list-style-type: none"> <li>observes, asks questions and predicts how plant and animals obtains water and nutrients.</li> <li>observes water bugs in a local waterway and records observation for a class journal</li> <li>uses a magnifying glass to examine changes water bugs during their life cycles and draws the changes</li> <li>collaboratively writes, illustrates and publishes a literary recount about the needs of growing animals</li> <li>designs and publishes a timeline that shows how a student has grown and changed since birth</li> <li>designs and publishes a timeline that shows how a bird* has grown and changed during a period of observation</li> <li>proposes questions for an expert when evaluating plans for an animal environment, eg a bird-friendly garden.</li> <li>selects and uses resources for the construction of a pond in the school environment to attract insects and frogs, eg water, plants, rocks.</li> </ul>
<b>LANGUAGE FEATURES</b>	<ul style="list-style-type: none"> <li>everyday words for location, position and direction</li> <li>This unit provides opportunities for students to explore information reports, descriptions and recounts.</li> <li>read and listen to texts about caring for the environment, both natural and built</li> </ul>		

# TEACHING UNIT

## ONGOING ACTIVITIES FROM PREVIOUS UNIT

- Bird Identification, although, in the ES1 unit, students did not keep a bird count..
- Circle discussions
- Our *Special Place*
- My totem

If the ES1 unit “Places We Know,” was not taught last year please read over the ES1 unit. You will need to briefly cover the concepts of bird identification, our *Special Place*, *My Totem* and the importance of student decision making, covered at this stage by the Circle Discussion process. It would be assumed that the *Need for Shelter* unit would be edited to accommodate time spent on the ES1 unit.

## WHAT’S NEW IN THIS UNIT

- Shelter, especially with regard to the students’ *Special Place*
- Environmental measurement
- Comparison of living (biotic) and non-living (abiotic) things.
- Using their new knowledge of *shelter* in another environment on excursion.

## INCURSION/EXCURSION

Planned at the beginning of the unit.

## SECTION ONE: PREPARATION

1. Review work covered in Kindergarten, by visiting the class’ *Special Place* and discussing each child’s *totem*. Note that this program makes the assumption that the students maintain the same *Special Place* from K to 6, to develop a long term view of the functioning of an environmental area.

Circle discussion:

- How is *Our Special Place* going? Do you know?
  - Have you observed?
  - Let’s go and use our senses and observe.
  - How have I cared for my *totem*?
2. Observation visit to *Our Special Place*. See Appendix for appropriate equipment. The students could observe:
    - birds, bugs, lizards, spiders etc as well as ...
    - non-living (abiotic) factors such as water, soil and air and

- human behaviour
- Students may wish to think about animal areas, human areas and shared areas.
- This may be a brief visit simply to update their observations.

Log books could be used during this work.

Circle Discussion:

- How would you describe Our Special Place? Healthy? Unhealthy?
- Why do you think this?
- Do we need to take action?

## SECTION TWO:

Teacher prepares a smart board presentation involving images of things people depend on in the environment. This includes built environments, so there could be images of steel, plastics, as well as food, air etc. Can students think of anything we don't depend on?"

Children participate in arranging these images on the smart board, stating how humans depend on these things. Can they rank them in order of importance? eg we depend on oxygen more than plastics.

Teacher asks:

- "Can you think of any ways in which humans change the environment?" There may be stories of how the school and the local area have changed due to human action. Tell stories and gather photos if possible.
- Teacher asks, "Has anyone done anything to Our Special Place since last year? Has that made *Our Special Place* more healthy or less healthy?"
- How could we measure the health of our *Special Place*? How can we tell others about this?  
Note that if these records are kept, then each class will, over time, have an ongoing responsibility for monitoring a specific area. Together, all classes will develop a detailed picture of the school and its surrounds.
- Circle discussion: Students discuss ways of measuring and reporting the health of their *Special Place*.

## Some Notes

Until now, students have only observed these elements. The step to measuring is a critical one. The measurements should be informal. The table below is for teacher use to guide the Circle Discussion.

So far the idea of shelter has not been mentioned. Hopefully students might raise this issue themselves in the *Circle Discussion*. If not, it is time for the teacher to challenge the students to consider this critical issue. Note also that the biotic or living elements of a system will be heavily dependent on the abiotic elements of a system in order to create shelter.

The material in the table below constitutes a large proportion of the unit as measurements should be taken regularly. On each occasion the focus should be on the generalisations the students can make after the field work.

Students should use magnifying glasses to make observations throughout their field work. In particular students should, if possible, examine changes to water bugs during their life cycles and draw the changes.

Teacher makes flash cards with geographical terms on them, such as north, south east west, near, far, high, low. These displayed in the classroom. As the students develop their fieldwork responses, they are to use this vocabulary.

Students could measure:

	Items being measures	Possible methods of measurement
Living (biotic)	birds	<p>INITIALLY</p> <p>Use the Birds in Backyards methods Refer to the Birds in Backyards website: <a href="http://www.birdsinbackyards.net/surveys/backyard-birds.cfm">www.birdsinbackyards.net/surveys/backyard-birds.cfm</a></p> <p>Shelter:</p> <p>Can you observe any nests in or near your <i>Special Place</i>? Count and record these.</p> <p>Can you find any nest material on the ground? (don't disturb a nest being used by birds</p> <p>Invite a bird expert .to your school.</p> <p>Choose 3 birds as a class and learn their scientific names</p> <p>Bird survey.</p> <p>AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK</p> <p>Invite a bird expert to meet with the class. Students should prepare for this visit in the <i>Class Circle</i>. Use this visit to allow students to answer the questions,</p> <p>" What impact do humans have on the local bird population?", and</p> <p>"How can we make <i>Our Special Place</i> more bird friendly?"</p> <p>A-"designs and publishes a timeline" that shows how a bird has grown and changed during a period of observation. You may wish to do this after the corresponding activity in the Human Behaviour section.</p>
	bugs, lizards, spiders	<p>INITIALLY</p> <p>Count bugs, lizards, spiders observed in a set period of time (eg 5 minutes). continue this on a regular basis (eg once a week, once a month) over the rest of the year)</p> <p>Count examples of <i>evidence</i> of bugs, lizards, spiders. E.g. number of eaten leaves (sample this by counting only in a small area, eg 1m<sup>2</sup>), count number of webs.</p> <p>Shelter:</p> <p>Can you count shelters in or near your Special Place? Photograph and/draw them.</p> <p>Display these images in class.</p> <p>Describe why the shelter suits that living thing.</p> <p>AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK</p> <p>Note that the following activity is also referred to below under the heading "Water".</p>

	<p>Students:  use Google maps to locate a waterway near your school.  discuss the map using words such as North, South, East and West, high low, far near.  observe water bugs and record observations for a class journal.  use identification charts from <i>Waterwatch</i>  observe, question and predict how plant and animals obtains water and nutrients.</p>
human behaviour	<p>INITIALLY  Observe other students at recess and lunch time.:  How many enter <i>Our Special Place</i>?  Do they  harm <i>Our Special Place</i>  help <i>Our Special Place</i>  neither harm nor help <i>Our Special Place</i>  Stage 1 students should not interact with the others they are observing.  They keep a count under the three headings above.  Note that if <i>Our Special Place</i> is outside the school area, this activity would need to be in class time and may involve viewing public use of your area.</p> <p>Shelter:  Students observe human shelters, commenting on  the materials used (eg non-living)  shapes (many straight lines)  how much human shelters change the environment they are built on.  the total number of students in the school.  population in the local area (The local council should be able to provide this information for you).  AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK  design and publish a timeline that shows how a student has grown and changed since birth.</p>
shared areas	<p>INITIALLY  Count and record any occasions in which different “items” in this survey interact with each other, e.g. students with birds, birds with bugs etc. Does this interaction help <i>Our Special Place</i> to be healthy, or does it damage the area in some way.</p> <p>Shelter:  Describe in words how human shelters are the same/different to animal shelters. If you can communicate with a bird “expert”, you may be able to compare the number of birds with the number of humans in the local area.  AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK  Using clay, create two shelters, one human, one of an animal. Invite students from another class in to see your display. Students, standing by their clay work, explain how the shelters are the same and different. They should</p>

		use the terms <i>natural</i> and <i>built environments</i> . Provide information about numbers if possible. Visitors are free to ask questions. If the students can't answer these questions they could become the focus of research in the next section of the program.
non-living (abiotic)	air	INITIALLY Measure the air temperature. Note that dial thermometers are available which are easier to read than a conventional thermometer. Invent a wind strength scale, eg, 1. no wind, 2. gentle wind, 3. medium wind, 4. strong wind. Get the class to vote on the level of wind for the days you are taking other readings and record the majority decision. Instruments which would help these informal measurements: a. paper wind turbine (pin wheel, wind sock, hand held streamers on a stick. AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK Students develop ways of displaying their results to communicate this information with others and decide on how to store the information for future use by other classes.
	soil	INITIALLY Use a thin stick (eg paddle pop stick, the end of a paint brush) pushed into the soil to measure the amount of organic material lying on top of the harder underlayer. Mark the stake and measure with a ruler after removing it. AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK Students consider adding organic material to the soil and counting to see if this increases the bug, lizard, spider population.
	water	INITIALLY If there is any water source or water flow in <i>Our Special Place</i> (this could be artificial: a watering system, for instance) take a 1 litre milk container and draw a black line on the bottom of it with a permanent marker. Fill the jug with a set amount of water (the amount will depend on how easily you can collect it and how much water it takes to make the line difficult to see. Play around with this, as it will work out in time. Ask the students to look into the container and observe the black line. They record whether or not they can see the line. Note that this work will lead on to the formal measurement of turbidity (the measure of how much light passes through water) in Stage 3 AS THE STUDENTS BECOME FAMILIAR WITH FIELD WORK See work under Bugs, Lizards, spiders above involving dipnetting in local waterways.

### SECTION THREE: HOW DOES EVERYTHING CONNECT?

- Students work in small groups to develop a class art work. The art work is to demonstrate the elements of the environment measured in the previous section.

### SECTION FOUR:

#### HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES

Show the data we have collected as a power point or smart board activity

Invite other groups to observe the activities

Create an assembly item about the findings

### SECTION FIVE

#### WHAT WILL WE DO IN THE FUTURE? (*Ongoing relationship with our special place*)

In this section, students examine ways to raise the awareness of the school community with regards to the students' *Special Place*.

- Circle discussion:

- Teacher: "We are going to discuss our feelings about our Special Place. Let's list some feeling words to help us." Words are displayed.
- Teacher: "Using our list words, explain what you feel about our *Special Place*?"

- Circle discussion:

- Teacher:"Let's find out what others know, think and feel about our *Special Place*. Who should we speak to?" (Possibilities are Principal, teachers, parents and other students)

- In the Circle discussion, students develop questions which could be used in a survey of the groups mentioned in the previous point.

- The final question could be "How could you help to care for our class' Special Place?" In this way, the whole community can become involved in the care of each *Special Place* into the future.

- Stage One students conduct surveys.

If the Circle Discussion and the surveys are seen to be overly challenging for the students, senior students could be invited to take on the role of mentors who guide the Stage One students through this process.

Stage One students monitor the actions of others to see if they have developed a commitment to the class' Special Place. Students may choose to:

- express thanks to those who have shown responsibility to the Special Place, or
- provide further information to those who haven't

### **Equipment list for Water bug Identification**

Water bug trays- large white trays if possible

Magnifying lenses

Identification charts

Buckets

### **Equipment for non living items**

Thermometers

Wind socks or something similar (pin wheel)

Paddle pop sticks , rules

1 Litre milk container with lines drawn on the bottom to indicate clarity of the water- in later stages this will become a Turbidity tube that is used in Stream watch investigations

### **MORAL DILEMMA: *IBIS IN THE PLAYGROUND*      *ES1 & S1***

This dilemma is intended to be used at any time throughout ES1 and S1 and can be used more than once providing the students do not become too familiar with it.

1. At xxx School many Ibis have moved in to feed on bugs in the soil on the oval. They also eat any leftover food from the students once Recess and lunch time have finished. The problem is, sometimes they come up to students while they are still eating and try to steal the food. Some children are frightened of the ibis.

Should the school try to get rid of the ibis, or leave them there? How would you get rid of them? What would this do to the ibis? If a child is frightened, what should they be allowed to do?

2. The Ibis are at the school because their normal homes are in drought... they have had almost no rain for many years. They have come to the area around xxx Rd Primary school in order to live... to find water while their home is very dry.

Should we protect the ibis while their home is so dry? What could we do to help protect them?

## STAGE 1

# Wet and Dry

This unit is a case study. It provides opportunities for students to explore the differences between natural and built environments in their community, with a focus on exploring a wet or dry environment, and highlighting ecological sustainability. The unit emphasises the skills of gathering information from direct sources and organising this information. It focuses on people's interactions with, and responsibilities towards, environments. Note: Teachers may prefer to base this unit on a different comparison of environments, e.g. built and natural environments, old and new built environments or hot and cold environments.



STAGE 1			
CORE OUTCOMES HSIE	<p><b>ENS1.5</b> Compares and contrasts natural and built features in their local area and the ways in which people interact with these features.</p>	INDICATORS	<ul style="list-style-type: none"> <li>• examines the differences between natural and built features and sites</li> <li>• identifies similarities and differences between natural features and sites in their local area and those in other areas</li> <li>• uses a range of geographical terms to describe location and features, eg east, west, mountain, valley, hill, city, and terms for geographical tools, eg map, globe, atlas</li> <li>• uses geographical tools to locate and investigate places, eg maps, globes, atlases</li> <li>• examines the values that people place on natural and built features and places</li> <li>• associates geographical terms for places and features with visual images</li> <li>• recognises the globe as a representation of Earth, differentiating between land and water</li> <li>• makes and interprets 3D models of features and places in their local area</li> <li>• constructs pictorial maps and uses these maps to locate real features</li> <li>• expresses feelings for particular environments and why they have these feelings</li> <li>• demonstrates an awareness that the features and places that are a part of their local area exist within a broader context, eg within a town/city, country.</li> </ul>
	<p><b>ENS1.6</b> Demonstrates an understanding of the relationship between environments and people.</p>		<ul style="list-style-type: none"> <li>• identifies ways in which people depend on the environment</li> <li>• identifies ways in which people's interactions with the environment can change that environment, eg the result of blocking up a river or chopping down trees</li> <li>• identifies and labels how the elements of an environment rely on each other</li> <li>• evaluates results of human change on environments that are relevant to them</li> <li>• identifies ways in which places in their immediate environment have changed and are continuing to change</li> <li>• shows an interest in environmental issues at local, national and global levels</li> <li>• identifies wise and unwise use of resources</li> <li>• suggests ways of caring for sites, features, places and environments, and through which they can contribute</li> <li>• recognises that Aboriginal peoples have interacted positively with the environment for a long time..</li> </ul>

EMBEDDED SCIENCE OUTCOME	<p><b>ES S1.6</b> Identifies and describes ways people and other living things depend upon the Earth and its environments.</p>	<ul style="list-style-type: none"> <li>• observes and records changes in living things over the seasons, eg deciduous trees changing, reptiles hibernating</li> <li>• describes changes in own body when breathing in and out</li> <li>• observes, asks questions and records what happens to plants when they are deprived of a requirement, eg water, air, sunlight, nutrients</li> <li>• participates in the designing and making of a terrarium to observe how water changes its form in a closed environment</li> <li>• retells, for video documentation, the procedure followed when designing and making a terrarium</li> <li>• observes a model of the water cycle and other cycles, and uses graphics software to create a slide show for use in reporting findings</li> <li>• records a farmer's or gardener's response to questions about plants and their needs, using a tape recorder</li> <li>• selects, with guidance, materials and resources to construct a display entitled 'From the earth to the dinner plate'.</li> </ul>
LANGUAGE FEATURES	<p>This unit provides opportunities for students to explore observations, descriptions, information reports and procedures.</p>	

## COMMUNICATION WITH PARENTS

Letter to parents (See end of this unit) includes:

- Explanation of the concept of our dependence on the natural environment. Explanation of the development of a data base of Invite parents to become involved in the unit by helping students to taking photos, make sound recordings, diagrams and take notes of examples of our dependence on the natural environment. Parents could help with their own child at home or participate in classroom activities if desired. The aim would not be to amass more information than can be organised by the students, so the task would be to compile data and then to categorise it in a meaningful way.

## ACTIVITIES

### INCURSION/EXCURSION

This excursion should help students to identify similarities and differences between natural features and sites in their local area and those in other areas

### SECTION ONE: PREPARATION

1. Class Circle discussion. Begin by reviewing the rules and structures of the Class Circle if it is some time since the students have used this process
2. Conduct first Circle Discussion asking students to recall their main learnings from previous *Answering the Call* units. Ask them about their *Special Place* and their *totem* if this is not forthcoming. Record the students' responses.
3. Teacher ask students, "Can you name basic needs of all living things?" This would include:
  - water
  - air
  - sunlight
  - nutrients/food
  - shelter
4. Introduce the categories *wet* and *dry*. In discussion, give the students the opportunity to recognise that these categories are based on the amount of water present in an environment. Ask students name some wet/dry areas in their local environment.

### SECTION TWO

#### A. FIELD OBSERVATIONS: SPECIAL PLACE

1. Students visit their Special Place and other surrounding natural environments, attempting to classify them as wet or dry in order to develop a data bank by taking photos, make sound recordings, making diagrams and take notes of examples of wet and dry environments. Make as many field study trips as is desirable. Parents could help with their own child at home or participate in classroom activities if desired. Having small groups working with a

parent would be very helpful during the observation sessions. The aim would not be to amass more information than can be organised by the students, so the task would be to compile data and then to categorise it in a meaningful way.

2. During this activity, students
  - a. observe animal interactions in their *Special Place*.
  - b. identify and label a simple food chain including birds.

Log books could be used throughout this observation work.

Students discuss:

- a. “What do you think might happen if living things can’t get what they need, such as:
  - water
  - air
  - sunlight
  - food
  - shelter
- b.. “Have people changed these environments? If so, how?” Look for:
  - blocked up drains, creeks,
  - removal of trees, shrubs,
  - garden escapes (weed plants used in gardens which have ‘got away’ and entered a natural environment)
  - soil disturbance
  - barriers to animal movement
- c. “How are natural and built features different?”
  - What are they made of?
  - What do they do?
  - Do they help living things, or harm them?
- d. “Can you use the following words to describe where we are observing?” Adult with each group displays the following words, encouraging students to use these to describe their surroundings:
  - north, south, east, west, city, country,
  - hill, slope, mountain, valley,

## **B. FIELD OBSERVATIONS: AT HOME**

The students repeat the above exercise at home to the best of their ability. They may wish to concentrate on only one aspect of the class observation/discussion. A note to parents may encourage interest across the family.

## C. BACK IN CLASS

1. Students attempt to locate and mark features they observed in the Field Observation activities on a Google Maps image of their Special Place.
2. Students use clay to create an art work entitled the “Shape of the Land” in which they attempt to show hills, creek lines etc in the areas they examined in their field observations. They could mark North on this. This work will give some indication of the students’ ability to work in 3D space. **A**
3. Class Circle discussion. Teacher lays out the photos, recordings, annotated Google Map etc from the field observations. Teacher asks, “How can we display our findings so that we show wet and dry environments?” During the Class Circle students make suggestions about how to classify and display the work with the teacher making final decisions in these areas. Other classes can be invited to visit the classroom.

## SECTION THREE

**Bird survey & Plant survey** (Refer to the Birds in Backyards website: [www.birdsinbackyards.net/forms-backyards-birds.cfm](http://www.birdsinbackyards.net/forms-backyards-birds.cfm))

### **Bird survey**

1. If possible organise for students to record all the birds they observe in their Special Place on a single day, over a fixed 20 minute period between as early as can be arranged.
2. Students tally the observed birds using the bird identification material on the Birds in Backyards website.
3. Students record observations of the birds using wet and/or dry areas.

### **Plant survey**

Contact your local council who should be able to provide you with pictures and names of your indigenous species as well as common local weeds. Students tally both weeds and indigenous species. This could be done in the students’ log book. The local Council’s bush care Officer may be able to give you information on why weeds exist (eg lack of fire) and what can be done to encourage indigenous plants.

## SECTION FOUR:

### **OBSERVING A LIVING: COMMUNITY: A *Closed System***

#### **Background for Teachers**

The purpose of this section is for students to identify and describe ways people and other living things depend upon the Earth and its environments.

For centuries humans have regarded the Earth as limitless. However, our planet is, in fact, a closed system in which energy and matter have recycled themselves for billions of years. Besides the energy that comes from the sun, Earth is a closed system which has a finite amount of energy, resources and capacity to accommodate waste.

To illustrate this point, the students establish and maintain a:

- worm farm,
- ant farm,
- phasmid (stick insect) or a
- terrarium

There are many websites which give instructions for the construction and maintenance of these environments

By examining the functioning of a closed living system, students will be able to identify cause and effect relationships which help or damage the ecosystem. Log books could be used here.

Class Circle Discussion:

Teacher asks (using vocab appropriate for your class)

- What does this system need for the living things to continue to live?

Students may reply:

- water
- food (energy)
- heat energy (temperature)
- What would happen if you had too much or too little:
  - water
  - food (energy)
  - heat energy (temperature)
- In small groups, students draw answers from the discussion above and create a *story board* by pinning these to the wall.

### Story board

Story boards are generally used in film making. They consist of a series of drawings which illustrate the development of the narrative. They are pinned to a board so they can be easily moved around to explore different relationships and various ways of organising the narrative. In groups students develop brief scenarios:

- What if too much water came into the system? Or too little?
- What if too much food came into the system? Or too little?
- What if too much heat came into the system? Or too little?

Students develop a simple series of drawings to illustrate each of these scenarios. These drawings could also feature information learned from the bird survey.

Leave this work at this stage as it will be revisited. See *Section Six* for further use of the *story board*.

## SECTION FIVE:

### EXCURSION

Before the excursion, ensure that students are aware of the name and some history of the original custodians of the land. Find out about the current activities of members of the local Aboriginal nation. <http://www.abc.net.au/indigenous/map/>

When planning and booking the excursion, the following points could be raised with the staff at the excursion venue.

Through observation, students could:

1. identify similarities and differences in natural features in their Special Place and on excursion  
Students should
2. identify wise and unwise use of resources (which resources get wasted at the end of their life? Which get recycled? Students note that natural ecosystems recycle everything) (Human impact)
3. discuss the values that people place on natural places by asking, “How have they treated this area? Well or badly? Why have people treated this area in this way?” (Human impact)
4. briefly express feelings for particular environments and why they have these feelings (this will be followed up back at school). (Personal response)
5. find out about Aboriginal life in the area (in the past and contemporary). (Human impact)

### BACK AT SCHOOL

6. use information/attitudes learned from the excursion to improve the Story Board drawings from *Section Four*.

## SECTION SIX:

### HOW DOES EVERYTHING CONNECT? AND HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES?

1. Feelings, discussed on excursion can be revisited now and used as stimulus for artwork or writing.
2. Another class can be invited to view a presentation of the students’ Story Boards. Scenarios described above will create the structure for the presentation.

## SECTION SEVEN:

### WHAT WILL WE DO IN THE FUTURE? (*Ongoing relationship with our special place*)

Circle Discussion:

1. “What did the bird survey tell us about our Special Place/local area? Is it healthy or not? Do we need to take action?”
2. Is my totem safe? Healthy?
3. “Are humans helping in these areas or doing damage?”
4. “If we need to take action do we need help? Who can we ask?”

With teacher help, Stage 1 plans actions to responsibly care for their *Special Place*.

**MORAL DILEMMA: *IBIS IN THE PLAYGROUND*      *ES1 & S1***

This dilemma is intended to be used at any time throughout ES1 and S1 and can be used more than once providing the students do not become too familiar with it.

1. At xxx School many Ibis have moved in to feed on bugs in the soil on the oval. They also eat any leftover food from the students once Recess and lunch time have finished. The problem is, sometimes they come up to students while they are still eating and try to steal the food. Some children are frightened of the ibis.

Should the school try to get rid of the ibis, or leave them there? How would you get rid of them? What would this do to the ibis? If a child is frightened, what should they be allowed to do?

2. The Ibis are at the school because their normal homes are in drought... they have had almost no rain for many years. They have come to the area around xxx Rd Primary school in order to live... to find water while their home is very dry.

Should we protect the ibis while their home is so dry? What could we do to help protect them?



## STAGE 2

# Australia: You're Standing In It

This unit provides opportunities for students to explore natural, heritage and built features in Australia, highlighting ecological sustainability and intercultural understandings. The unit emphasises the skill of mapping to find and record information. It focuses on investigating and evaluating the significance of particular sites and places, and what people value about them.



CORE OUTCOMES HSIE	<p><b>ENS2.5</b> Describes places in the local area and other parts of Australia and explains their significance.</p>	INDICATORS	<p>The student: locates and names the capital city of Australia and of each State/Territory, and major regional centres gives reasons why particular activities may be associated with particular natural, built and heritage features and places compares natural and built features, sites and places in their local area with other locations in Australia or the world locates and maps cities, rivers and mountains in NS W and uses locational terminology such as north, south, east, west recognises that Aboriginal nations and boundaries provide a way of understanding the Australian continent recognises Aboriginal place names for places in Australia</p>
	<p><b>ENS2.6</b> Describes people’s interactions with environments and identifies responsible ways of interacting with environments.</p>		<p>The student: identifies issues about the care of places in the community or places of importance to them examines the effects of regulations, laws and practices associated with the management and care of natural and built features and sites evaluates the necessity of caring for and conserving a feature, site or place identifies the consequences of using features, sites and places in different ways.</p>
EMBEDDED OUTCOME SCIENCE AND TECHNOLOGY	<p><b>LT S2.3</b> Identifies and describes the structure and function of living things and ways in which living things interact with other living things and their environment.</p>		<p>draws and labels a plan to refine ideas for making a diorama to show a food chain/web within a particular environment designs and makes a model of a settlement suited to a particular environment with consideration for the interactions of living things, eg space, underwater chooses a means of publishing a report on the life cycle of an animal, eg silk worm or frog uses a digital or reflex camera to record stages of an animal’s life cycle.</p>
LANGUAGE FEATURES	<p>This unit provides opportunities for students to explore factual descriptions, information reports, explanations, expositions and discussions.</p>		

## ACTIVITIES

### SECTION ONE: PREPARATION – The History of People and the Land

Teacher reads story which indicates the prior ownership of Australian land by aboriginal nations: The Paddock by Lilit Norman (out of print, but still in some school and local libraries) Father Sky, Mother Earth by Oodgeroo Noonuccal (Kath Walker). Discuss what aboriginal people must have felt at the loss of their land.

**Assessment:** Ask students to respond individually to the following questions (this could be in multiple ways - writing, art, dance...)

- “When is it right to take something from somebody else who owns it?”
- “What would happen at school if we had a rule that you could take things from other people?”
- How would you feel?”
- How long would you feel this way?”

Teacher introduces the ABC online Indigenous-Interactive Map which provides current news, examples of aboriginal languages as well as boundaries and names of aboriginal nations. <http://www.abc.net.au/indigenous/map/> and allow the students to informally explore the site.

### SECTION TWO: THE RETRIEVAL CHART

In this section, students organise their thinking through the use of a retrieval chart. This could be done individually or in small groups, Alternatively, if the chart was displayed on the wall it could be completed by the whole class with students displaying work on the chart as they complete sections of their research.

**Assessment:** anecdotal observations of Student’s research and presenton.

A blank copy of the retrieval chart could be given to each student at the of this work as an assessmen task.

### Our Special Place

Students learn to use the retrieval chart in familiar surroundings, thier Special Place. Students could work in groups with the retrieval in hand, making notes. Back in class this information can be transfered to the class retrieval chart.

Also the bird survey can be conducted when in their special Place and entered into the chart

Class Retrieval chart

Environments	What is the aboriginal history of these places?	What happens in this environment?	How are these environments the same? Different?	How do people change the environment to suit themselves?	What are the consequences of the changes?	
<p>Natural Name of Place:</p> <p>Location:</p>		<p>Special Place: People sometimes walk through the forest towards the train station.</p> <p>Excursion: This is a large park where people come for picnics, bbqs and for excursions</p>				
<p>Built Name of Place:</p> <p>Location:</p>		<p>Special Place: There are no buildings in our Special Place but there are houses all around it. Some people throw weeds from their garden over the fence.</p>				

## AUSTRALIA: OUR SHARED ABORIGINAL PAST

In small groups, students:

- locate and names the capital city of Australia and of each State/Territory, and major regional centres. Record these on a map.
- locate and map, rivers and mountains in NSW and uses locational terminology such as north, south, east, west (The list of cities and rivers could be provided by both the teacher and the students).
- Locate aboriginal nations, and investigate languages and recent news items from <http://www.abc.net.au/indigenous/map/>
- compare natural and built feature, sites and places in their local area with other locations in Australia or the world. (Key ideas here are that built environments tend to be more structured and linear and their purpose is to satisfy human needs. Natural environments are more informally structured and their purpose is generally the continuation of life).
- choose a small number of natural and built environments (perhaps just one of each. These may be more relevant if they are local) They list the kind of activities that occur in those environments and give reasons why particular activities may be associated with particular natural or built features. Table 1 could be used.
- choose a small number of natural and built environments (perhaps just one of each. These may be more relevant if they are local) They list the kind of activities that occur in those environments and give reasons why particular activities may be associated with particular natural or built features.

Choose 2 sites from the ABC website <http://www.abc.net.au/indigenous/map/>, one build, one natural. List the kind of activities that occur in those environments and give reasons why particular activities may be associated with particular natural or built features. The following chart could be used:

### SECTION THREE: EXCURSION

Teacher selects an excursion venue which is able to expand the students understanding of the concepts of this unit. You will need to discuss with education staff regarding timing to do the bird survey during the excursion. If this is undesirable on the excursion, the same result could be achieved by selecting another site (perhaps in the school's local area) in order to be able to compare results in two different locations.

On the excursion students will:

- identify issues about the care of the site (has the site previously been damaged? Are there any threats to the site now?)
- examine management practices such as signage and rules given by Education Officers. They could ask, "Are there any laws about looking after this site?"

Evaluate: students express how well they think the management of the site is going. They could answer the questions:

- "Is this site becoming more healthy,
- become less healthy,
- staying the same.
-

Identify consequences. They could answer:

- What good things could happen in these areas in the future?
- What bad things could happen in these areas in the future?

#### **SECTION FOUR: BACK AT SCHOOL. MAKING SENSE OF THE EXCURSION. HOW DOES EVERYTHING CONNECT?**

##### **Moral Dilemma: Mining in the Park:**

Students display care for the environment by participating in a moral dilemma role play. The key theme of Section Three above is “caring”. The students are being asked now to take an ethical approach to an issue about State and National Parks. The students now take part in a moral dilemma role-play as a class.

Compare the two bird surveys completed in this unit and recorded on the retrieval chart.

#### **SECTION FIVE: HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES?** (This would include other students, teachers, parents and families, the local community)

Invite parents into the classroom to participate in the moral dilemma. They could be given the same roles as the students have already been given. Students could work with parents in teams to develop their responses.

#### **SECTION SIX: WHAT WILL WE DO IN THE FUTURE?** (Ongoing relationship with our special place, with excursion site)

Using an appropriate decision-making model, students discuss the possibility of class commitments to:

continuing to research aboriginal history.

continuing bird surveys when possible throughout the year.

research, plan and take action if bird survey information indicates a problem.

## MORAL DILEMMA: MINING IN THE PARK

### INTRODUCTORY NOTE

The following moral dilemma is intended to generate thoughtful discussion amongst the students. It is not intended to put down one point of view over another. Environmental needs and economic needs should both be valued but can be prioritised.

To gain a strong reaction, the dilemma can be presented as fact. In the role of teacher, you can elicit responses before telling the class that this is not really happening, but was intended to evoke genuine feelings about the use of the environment.

However, if you feel this is inappropriate for your class, explaining from the outset that it is only a story may be a better approach.

### INPUT TO STUDENTS

There are new plans for the site you have visited on excursion. Valuable minerals have been found in the [park] and the government has agreed to mining in the area. This will create many jobs and money for Australians. However, the waterways may be damaged, and both animals and plants will need to be removed. Some may die.

Some scientists have said that this work can be done with little damage to the environment, while others say the [park] will never be the same, with plants and animals dying out in some areas and waterways becoming polluted.

What will you do?

- Decide that you are not interested and let others decide what will happen? OR
- Express your opinion (to the government, to the media, to the company)? What would your opinion be? OR
- Find out more information before you decide what to do? How could you find out more information?
- What else would you do?

Retrieval chart template

Environments	What is the aboriginal history of these places?	What happens in this environment?	How are these environments the same? Different?	How do people change the environment to suit themselves?	What are the consequences of the changes?	
Natural Name of Place:       Location:						
Built Name of Place:       Location:						

## STAGE 2

# State and National Parks

This unit provides opportunities for students to explore the issues, values and attitudes associated with the establishment of State and National Parks, highlighting ecological sustainability. The unit emphasises the skill of gathering information through direct and mediated observations of a particular place. It focuses on relevant case studies of State and National Parks in NSW and Australia.



CORE OUTCOMES HSIE	<b>ENS2.5</b> Describes places in the local area and other parts of Australia and explains their significance.	INDICATORS	<ul style="list-style-type: none"> <li>names and locates natural, built and heritage features in their community and evaluates their significance</li> <li>gives reasons why particular activities may be associated with particular natural, built and heritage features and places</li> <li>compares natural and built features, sites and places in their local area with those in other locations in Australia or the world</li> <li>compares ways in which members of the community use features of the community to meet their needs</li> <li>recognises the importance of some Aboriginal land and water management practices</li> <li>uses geographical terminology to describe natural and built features in their community</li> <li>locates and maps national parks in NSW and uses locational terminology such as north, south, east and west</li> </ul>
	<b>ENS2.6</b> Describes people's interactions with environments and identifies responsible ways of interacting with environments.		<ul style="list-style-type: none"> <li>identifies organisations concerned with the care of features, places and environments in the community</li> <li>examines the effects of regulations, laws and practices associated with the management and care of natural and built features and sites</li> <li>compares the care of Australian environments with environments in other countries.</li> <li>evaluates the necessity of caring for and conserving a feature, site or place</li> <li>presents alternatives and consequences of using features, sites and places in particular ways</li> <li>gives reasons why a specified feature, place or site should be cared for</li> <li>recognises that Aboriginal people have a special relationship with the land and sea</li> <li>plans a strategy for caring for a particular place.</li> </ul>
EMBEDDED SCIENCE OUTCOME	<b>LT S2.3</b> Identifies and describes the structure and function of living things and ways in which living things interact with other living things and their environment.		<ul style="list-style-type: none"> <li>observes and reports on a local environment, describing how plants and animals rely on each other</li> <li>devises and implements a fair test with assistance, to find out the impact of water pollution on plants and reports on findings.</li> <li>designs and makes a model of a settlement suited to a particular environment with consideration for the interactions of living things, eg space, underwater</li> <li>designs, makes and uses a database to record information on selected flora and fauna</li> <li>chooses a means of publishing a report on the life cycle of an animal, e.g. silk worm or frog</li> <li>uses a digital or reflex camera to record stages of an animal's life cycle.</li> </ul>
LANGUAGE FEATURES		INDICATORS	This unit provides opportunities for students to explore descriptions and information reports.

## EXCURSION

Visit a state or national park

## SOME WEB RESOURCES

[www.copacabana-p.schools.nsw.edu.au/](http://www.copacabana-p.schools.nsw.edu.au/) | -  
[www.australiannationalparks.com/](http://www.australiannationalparks.com/)  
[www.stateparks.nsw.gov.au/](http://www.stateparks.nsw.gov.au/)  
[www.cultureandrecreation.gov.au/articles/nationalparks/](http://www.cultureandrecreation.gov.au/articles/nationalparks/)

## ACTIVITIES

### SECTION ONE: PREPARATION

The key word “HERITAGE” is displayed prominently in the classroom to provide for a display which will be built up during Section One: Preparation. Students:

- discuss their understanding of the word “heritage”.
- discuss their local area, naming natural and built places of value to them or too the community.
- use street directories, Google Maps or Where is to locate these features.
- record their ideas on why these areas are valued by people..
- visit, where possible, at least one of these sites and give reasons why the site is used as it is.
- discuss and record how members of the community use this place to meet their needs.
- display all work above with the key word “heritage”.

Measure the health of the site by conducting a bird survey on site and then repeating the survey back at the class’ Special Place.

Bird survey (Refer to the Birds in Backyards website: [www.birdsinbackyards.net/forms-backyards-birds.cfm](http://www.birdsinbackyards.net/forms-backyards-birds.cfm))

If possible organise for students to record all the birds they observe in their Special Place on a single day, over a fixed 20 minute period between as early as can be arranged.

Students tally the observed birds using the bird identification material on the Birds in Backyards website.

Students record observations of the birds using wet and/or dry areas.

Discuss how the two areas (local site and Special Place) compare in terms of

- the bird population. Students suggest possible reasons for any differences. File survey results back at school.
- ways in which the two areas are valued.

Compare their local site with those in other locations in Australia or the world. See [www.environment.gov.au/heritage](http://www.environment.gov.au/heritage) for Australian sites and <http://whc.unesco.org/en/list/211> for a listing if official World Heritage sites. Students visit these sites and fill in Worksheet attached.

## SECTION TWO:

Students:

Research Aboriginal land management

WEBSITES:

Note that the reading levels of these articles will be well above the students. Having other staff or parents involved with small groups to locate main ideas will be necessary.

[http://knowledgeweb.afac.com.au/research\\_reports/fire\\_behaviour/savannah\\_fire\\_behaviour/traditional\\_aboriginal\\_land\\_management](http://knowledgeweb.afac.com.au/research_reports/fire_behaviour/savannah_fire_behaviour/traditional_aboriginal_land_management)

An Article entitled Traditional Aboriginal Land Management

[http://www.nlc.org.au/html/care\\_con.html](http://www.nlc.org.au/html/care_con.html) from the website Caring for Country

[http://www.nlc.org.au/html/care\\_land\\_key.html](http://www.nlc.org.au/html/care_land_key.html) From the website Caring for Country

[www.csiro.au/science/AboriginalLandSeaManagementTopEnd.html](http://www.csiro.au/science/AboriginalLandSeaManagementTopEnd.html) CSIRO partnership with Aboriginal communities in the top end.

If the class studied Australia: You're Standing in It last year, students:

- revise and could possibly be reassessed on knowledge of capital cities of Australia and of each State/Territory, major regional centres and a sample of small towns, settlements physical features such as cities, rivers, mountains.
- use locational terminology such as north, south, east, west
- examine the effects of regulations, laws and practices associated with the management and care of natural and built features and sites
- recall and interpret bird survey results from last year.
- Appropriate revision would be necessary.
- Write a description of Australia featuring the facts they have located.

## SECTION THREE: EXCURSION

When booking your excursion, ensure it deals with:

- management issues and
- observations of life cycles and
- the long-term history of the park (pre-European arrival).

Before the excursion, students prepare questions on a, b and c above. These can be sent to the Education Staff before the excursion.

Also check whether it is possible/practical to conduct a bird survey on site for comparison back at school.

### Back at school, students:

Design, make and uses a database or retrieval chart to record information from the bird surveys.

Use the database/retrieval chart to compare the three bird surveys. (Surveys 1: local site visited in Section One, Surveys Two at the Class' Special Place and Survey 3 on excursion).

Write a brief information report on birds which have been observed.

#### SECTION FOUR: SIMULATION/ MORAL DILEMMA

Teacher explains to students that this moral dilemma is like a play in which they will have to understand facts in order to make decisions which benefit people and the earth. Students:

- review the significant management issues which were identified during the excursion.
- participate in a simulation activity in groups of about 4 or 5. Each student takes on one of the following roles: Scientist, Politician, Ranger, Reporter
- discuss how they might act in their role.
- identify the viewpoints of students who have roles other than their own regarding how sites, places and features can be cared for, and demonstrates an appreciation of the rights of others to have these viewpoints.

They are told that, in the assessment of their work in the moral dilemma, they must:

- Describe the health of the park over time. They could use the chart below.

	Before the First Fleet	In the Last 200 Years	Now
How has the park been cared for?			
How has the park been damaged/ How will it be damaged?			

## **MORAL DILEMMA: MINING IN THE PARK**

### **INTRODUCTORY NOTE**

The following moral dilemma is written specifically for the unit Australia: You're Standing in It. It is intended to generate thoughtful discussion amongst the students. It is not intended to put down one point of view over another. Environmental needs and economic needs should both be valued but can be prioritised.

To gain a strong reaction, the dilemma can be presented as fact. In the role of teacher, you can elicit responses before telling the class that this is not really happening, but was intended to evoke genuine feelings about the use of the environment.

However, if you feel this is inappropriate for your class, explaining from the outset that it is only a story may be a better approach.

### **INPUT TO STUDENTS**

There are new plans for the site you have visited on excursion. Valuable minerals have been found in the park and the government has agreed to mining in the area. This will create many jobs and money for Australians. However, the waterways may be damaged, and both animals and plants will need to be removed. Some may die.

Some scientists have said that this work can be done with little damage to the environment, while others say the park will never be the same, with plants and animals dying out in some areas and waterways becoming polluted.

Note: During the playing of the dilemma, the story above is to be taken as true. What will you do?

Decide that you are not interested and let others decide what will happen? OR

Express your opinion (to the government, to the media, to the company)? What would your opinion be? OR

Find out more information before you decide what to do? How could you find out more information?

What else would you do?

The teacher calls an end to the dilemma when enough assessment information has been gathered, or when the students have resolved the issues. A moral dilemma such as this can last one or two sessions or may continue over many weeks. The longer the dilemma lasts, the more outcomes from various KLA's will be covered.

Finally students need to discuss the processes they have worked through, what they have learned and what they felt. Students can become very involved in their work, and debriefing should always be used to bring the dilemma to a close.

## **SECTION FIVE: HOW DOES EVERYTHING CONNECT? A DEBRIEFING FOR MINING IN THE PARK**

Initially, allow students to discuss the mining as if it were real.

Students focus on their moral dilemma work and discuss:

- How did you feel about the park:
- when you learned you were going on the excursion?
- when you were on the excursion?
- when you were told that mining was going to occur?
- What have you learned about the park (include information about traditional and contemporary aboriginal involvement with the park)
- How should the park be looked after? What rules should there be to make sure it's protected?
- How did you feel about the mining story? Is it okay to create stories like that to help learning?
- How can we tell others about our experiences?
- What should we do in the future?

Students should be warmly congratulated if they have participated well, as dilemmas have the potential to produce very intense learning.

## **SECTION SIX: HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES?**

Using school assemblies. Lunch time presentations, creating a story book or mural are examples of how we can tell others about it. Suggest to the student how they might like to tell the story.

## **SECTION SEVEN: WHAT WILL WE DO IN THE FUTURE? (Ongoing relationship with our special place)**

Responses to both SECTIONS SIX AND SEVEN will be determined by the ideas coming out of the debriefing

WORKSHEET 1

LOCATION	Why is this site important	WHAT ACTIVITIES HAPPEN HERE?	WHO CARES FOR IT	IN YOUR OPINION, WHAT SHOULD HAPPEN IN THE FUTURE AT THIS SITE?
Local site				
Australian Site				
World Site				

## STAGE 3

# Current Issues: A Simulation

This unit is a case study only. It provides opportunities for students to explore issues and decision-making surrounding a current issue, highlighting ecological sustainability and beliefs and moral codes. The unit emphasises the skill of acquiring current information through relevant sources such as the internet, newspapers and television. It focuses on how beliefs about human interaction have changed over time and how they vary according to each person's perspective and interest.

Board of Studies, Current Issues: Antarctica HSIE Syllabus

“Simulation”: A class activity in which students mimic the real world by facing a realistic problem and taking on the roles of people in the community. It is an open-ended method of teaching because, with the teacher's guidance, the students drive the unit through their own decision-making.



CORE OUTCOMES HSIE	ENS3.6  Explains how various beliefs and practices influence the ways in which people interact with, change and value their environment.	INDICATORS	<p>The student:</p> <ul style="list-style-type: none"> <li>• examines factors that may give rise to different views about the care of places</li> <li>• evaluates alternative views about the use of natural and built environments.</li> <li>• examines how natural, cultural, religious, historical, economic and political factors can influence people’s interactions with environments</li> <li>• identifies the different viewpoints of groups and individuals about uses of land</li> <li>• examines issues associated with differing values about natural and built environments, using a variety of sources, including the media</li> <li>• expresses a personal point of view on an environmental issue and provides supporting evidence.</li> </ul>
EMBEDDED SCIENCE OUTCOME	LT S3.3 Identifies, describes and evaluates the interactions between living things and their effects on the environment.		<p>The student:</p> <ul style="list-style-type: none"> <li>• devises a presentation for younger students on the likely impact of removing one form of life from a food chain</li> <li>• devises and implements a means of comparing physical characteristics (eg eye colour) of a family over three generations and presents findings</li> <li>• predicts outcomes of seed growth tests, undertakes tests, documents findings and shares conclusions</li> <li>• undertakes a detailed observation of an insect colony, develops questions and plans non-destructive tests to collect more data</li> </ul>
LANGUAGE FEATURES	<p>This unit provides opportunities for students to explore observations, descriptions, information reports and procedures.</p> <ul style="list-style-type: none"> <li>• The HSIE teaching strategies/practices in this unit include mind maps, retrieval charts, flow charts, models, guest speakers and diagrams.</li> </ul>		

The SBS World Guide (<http://www.sbs.com.au/shop/>)

National Press Club [www.npc.org.au/](http://www.npc.org.au/)

## ACTIVITIES

### SECTION ONE: THE SIMULATION

1. Students will need to become familiar with a significant environment such as a major river system (eg the Murray), a State or National Park, a marine environment (The Great Barrier Reef), Antarctica etc. They may do this in some cases through an excursion, or, in other cases, through research. All students need to examine the same environment. This part of the unit may last several weeks and will probably put into practice skills they have already been developing.
2. The Dilemma  
As teacher, you now put an issue of concern to the students. This could be real (the Murray drying up) or could be created by you (“What would happen if drilling for oil was allowed in the Antarctic? Let’s suppose this has happened”). If you feel comfortable, you could announce this as genuine news of the day before telling the students that it’s not really happening, in order to elicit a strong response.
3. Students briefly discuss the consequences of this issue.
4. The students are then given roles such as:
  - a. Politicians (you could nominate a Prime Minister, a Premier, a local member)
  - b. Journalists (print, TV, radio)
  - c. Scientists
  - d. Protesters
  - e. Residents (in Antarctica, this could be those living on Antarctic Bases)
  - f. Members of Environmental organisations.
  - g. Executives of the oil company.
5. With seven or so roles, students can group with others who share their role

6. Their first task is to research their role.

The class "journalists" could try emailing their local paper, a TV station or the National Press Club [www.npc.org.au/](http://www.npc.org.au/) in order to research the work of a journalist. The group of class journalists would work together, sending only one message to each recipient.

The "politicians" could write to their local member, and so on.

In past years the students have gathered data through the Bird Survey. The teacher asks: "Is the Bird Survey an appropriate method of collecting data in our simulation? If not, why not? How will we gather data this time? How can you tell the difference between an appropriate method of collecting data and an inappropriate one? (i.e. this looks at the criteria for selecting methods of data collection).

Students also research:

- why some people find the place in the scenario to be special. They could compare these attitudes with their attitudes to their own Special Place.
  - the existence of any relationships between people and the natural environment which have parallels to their totem.
7. Each member of the class has to decide on appropriate response to the dilemma. They may group and regroup in any way that helps their point of view. The politicians may find themselves agreeing and working together, or they may disagree and some may prefer to work with scientists while other politicians work with the oil company. They must always stay in role, so a politician can't help an oil executive to plan the drilling, but he could ask the members of the media to do some interviews about how much money this oil would give us all (and how much tax the government would get!)
  8. If a politician requests interviews, the journalists could use video cameras, tape recorders and computers to conduct interviews. Meanwhile, the residents may be planning protest banners, marches and media interviews. These could occur either in class or in the playground (the rest of the school would need an explanation!)
  9. Some students are likely to find the open-ended nature of this learning difficult and they may become disorganised. This provides an opportunity to talk to students about their organisation and make suggestions for improvements. With support from other class members, sometimes a student can begin developing skills because there is a large reward (participation) if they can succeed. If progress isn't made, the student will require the tasks to be modified to their needs.

## **SECTION TWO: HOW DOES EVERYTHING CONNECT?**

Early in this whole process, the class would have to decide on how they were going to make a final decision. A parliamentary hearing, a court case, a public meeting would all be appropriate. The s options allow all students to present their term's work and could be conducted at a school assembly.

## **SECTION THREE: WHAT WILL WE DO IN THE FUTURE?**

Note : The last Answering the Call unit the students will participate in will be either Australian Democracy or Current Issues. Both of these units have been written to end with an assembly which celebrates their achievements throughout the Answering the Call program. This needs to be omitted from the unit studied in Year 5

If Current Issues is NOT the last unit (Year 5), students research national and international agencies which take on issues similar to their own simulation (Australian Conservation Foundation, Greenpeace etc). They could discuss whether they wish, as a class, to support an agency.

If Current Issues IS the last unit (Year 6) students participate in an assembly which traces the students' involvement in Answering the Call over the period of time they have been involved (potentially seven years) This assembly should refer to memories of their Special Place, their relationship with their totem and their understanding of their ethical responsibilities. Finally the assembly could conclude with a commitment to ethical environmental behaviour in the future.

## STAGE 3

# Australian Democracy

This unit provides opportunities for students to explore beliefs and ideals associated with democracy, both in past societies and contemporary Australia, highlighting democratic processes and social justice. The unit emphasises the skill of civic participation. It focuses on the principles of representative government.

The unit provides the students with the opportunity to make real decisions which they can implement within the school community.

**This unit is a supplementary unit** - not all outcomes will be covered within this unit of work

Note: In the last *'Answering the Call'* unit the students will participate in either Australian Democracy or Current Issues. Both of these units have been written to end with an assembly which celebrates their achievements throughout the *'Answering the Call'* program.

This needs to be omitted from the unit studied in Year 5.



CORE OUTCOME HSIE	<p><b>SSS3.8</b> Explains the structures, roles, responsibilities and decision-making processes of State and federal governments, and explains why Australians value fairness and socially just principles.</p>	INDICATORS	<ul style="list-style-type: none"> <li>investigate the people and processes involved in legislative, executive and judicial functions of State and federal governments</li> <li>become involved in classroom and school activities that use democratic processes</li> <li>identify, through a variety of media, situations where civic action has led to the improvement of community living</li> <li>accept civic responsibility through community involvement.</li> </ul>
EMBEDDED SCIENCE OUTCOME	<p>LT S3.3 Identifies, describes and evaluates the interactions between living things and their effects on the environment.</p>		<ul style="list-style-type: none"> <li>plans and manages the construction of a bush food/vegetable garden, identifying and resolving the need for funds and expert advice</li> <li>develops a detailed plan to conserve or improve a local nature reserve/park using a simple scale, symbols and annotations</li> <li>uses a water testing device to check the water pollution level in a local waterway and discusses findings, eg with an expert</li> <li>selects the most appropriate medium to record and investigate local plants used by an Aboriginal community</li> <li>prepares arguments about the potential effects of a new technology on living things after researching current news.</li> </ul>
LANGUAGE FEATURES	<p>This unit provides opportunities for students to explore observations, descriptions, information reports and procedures. The HSIE teaching strategies/practices in this unit include mind maps, retrieval charts, flow charts, models, guest speakers and diagrams.</p>		

## RESOURCES

- Australian Curriculum Assessment and Reporting Authority [www.acara.edu.au](http://www.acara.edu.au)
- The Board's website (<http://www.boardofstudies.nsw.edu.au>) lists current available resources such as some selected
- eg *Towards a New Dreaming: Future Directions for Land Management in Australia* (Clean Up Australia Ltd, 1995).
- Local Aboriginal organisations for information about Aboriginal land management practices, eg management of water as a scarce resource.
- Other local organisations that have a role in the care of environments.
- Excursions to natural or built, wet or dry environments, eg a dam, a river, a beach, a bore well.

## ACTIVITIES

### INCURSION/EXCURSION

Local Council Chambers

State Parliament

Federal Parliament

School visits by local politicians

### IMPORTANT NOTE

The teacher explains to that as they are now in Stage 3, they are now to take on the role student leaders. Note that, unless students have a decision-making process, it is almost impossible to put leadership skills into practice. The Federal Parliament's *Parliamentary Education Office*, provides a website which contains a rich variety of possibilities for classes. It is critical that the students are involved in the selection of methods of decision-making and in the action to be taken. Therefore, this unit only provides a possible course of action, leaving teacher and students to enact leadership together.

See the website of the Federal Parliament's *Parliamentary Education Office (PEO)*:

[www.peo.gov.au](http://www.peo.gov.au)

Note: many schools will already have structures such as School Councils. In that case the PEO website ideas – or any other leadership ideas – will need to be tailored to the existing procedures.

## SECTION ONE: LEADERSHIP AND ENVIRONMENT

### LEADERSHIP

The students:

1. discuss the need for student leadership in the school:
  - what would happen without student leadership?
  - what qualities in student leaders in the past have I admired?
  - What leadership qualities would I like to display myself this year
  
2. Brainstorm:
  1. what would good leadership look like.
  2. What would we have to do to make this come about?
  
3. Record the qualities of good leadership in a mind map

### ENVIRONMENT

The students:

1. Complete their final bird survey both at the school and at the class' Special Place.
2. Receive from the teacher all filed information from previous *Answering the Call* units. Students review the environmental information that they have gathered during the years they have participated in *Answering the Call*. All filed information from previous bird Surveys and other filed records are presented to the students.
3. Discuss the meaning (the messages) in this data. Students describe any trends they can see by creating:
  - a. graphs, (eg changing bird numbers),
  - b. tables,
  - c. statements which draw conclusions, and
  - d. statements of ethical ideas.
4. Display the trend statements and conclusions around the classroom.  
The students may wish to invite other classes, teachers and parents in to view their final interpretations of possibly seven years of environmental research.

5. Data filed for use by future classes

## SECTION TWO:

Students work on computers in small groups looking at the PEO website, [www.peo.gov.au](http://www.peo.gov.au)  
They should spend most of their time looking at the DIY Role Play section researching how to run a class parliament.

*If they wish, they can use these structures to make a one-off decision, or you could examine the possibility of running a class parliament all year. If you choose a whole year program, the Class Parliament can be recorded in the English section of the program as it is an outstanding way to provide a real context for formal and informal speech and writing. It also covers a number of outcomes in the PDHPE Syllabus. Also, although, they were published some time ago, two kits called The Parliament Pack (1987) and The Parliament Pack 2 (1988) contain some excellent material. They can still be found in many school libraries.*

*The aim would be that by the end of Section Two, teacher and students will have decided on:*

- a. a decision making structure which is simple and clear to use, and*
- b. a length of time that this structure will last for.*

## SECTION THREE:

The following sections presume that the class proceeds with Class Parliament, but many decision-making procedures would work very well. If using your own method, please substitute your own process wherever Class Parliament is referred to.

Students plan actions which they could implement to improve their local environment. These ideas should be drawn from their bird survey data now displayed in the classroom or they could be new ideas. This could involve some kind of environmental audit of the school. They could also be drawn from the Science and Technology Syllabus:

Students could:

- Conservation or regeneration of the class' Special Place
- plan and manage the construction of a bush food/vegetable garden, identifying and resolving the need for funds and expert advice
- develop a detailed plan to conserve or improve a local nature reserve/park using a simple scale, symbols and annotations

- use a water testing device to check the water pollution level in a local waterway and discusses findings, eg with an expert (check with your local water authority).
- select the most appropriate medium to record and investigate local plants used by an Aboriginal community

Students:

1. discuss these matters with the principal, the staff and parents.
2. gather support amongst their peers for their ideas and prepare their “bill” in written form.
3. Conduct a session of parliament following the guidelines on the Parliamentary Education Office website, [www.peo.gov.au](http://www.peo.gov.au)
4. Show their new law, if passed, to all stakeholders: the Principal, staff other students and parents.

#### **SECTION FOUR: HOW DOES EVERYTHING CONNECT?**

##### **ASSESSMENT ITEM**

Students: keep a wall chart of all laws passed. Regular class discussions on the progress of the laws into action should enable the students themselves to answer the question, “How does it all connect?”

Students could be asked to respond in writing to this question, which could then be used as an assessment item.

#### **SECTION FIVE: HOW CAN WE TELL OTHERS ABOUT OUR DISCOVERIES?** *(This would include other students, teachers, parents and families, the local community)*

##### **ASSESSMENT ITEM**

Students: research the views of stakeholders regarding their views on the functioning of the Class Parliament. This could be done through a survey developed and conducted by the students. Depending on the results, the students may need to change the way they promote Class Parliament.

#### **SECTION SIX: WHAT WILL WE DO IN THE FUTURE?**

1. If *Australian Democracy* is NOT your final unit in Yr 6, then the students could participate in the following activities:
  - Spend some silent time with your totem.
  - Write:
    - “What my totem has seen” (in its lifetime)

- “I sat for a long time with my totem.

- Implement your plans to protect your totem

2. If *Australian Democracy* IS your final unit in Yr 6, then the students could participate in the following activities:

### **S3 Final Unit**

- Discussion:
  - Implement your plans to protect your totem
  - “What, if anything, have you learned from your totem?”
  - “What if everyone had a totem? Would it make any difference?”

### **3. ASSEMBLY**

Note : The last *Answering the Call* unit the students will participate in will be either *Australian Democracy* or *Current Issues*. Both of these units have been written to end with an assembly which celebrates their achievements throughout the *Answering the Call* program. This needs to be omitted from the unit studied in Year 5

Students participate in an assembly which traces the students’ involvement in *Answering the call* over the period of time they have been involved (potentially seven years) This assembly should refer to memories of their Special Place, their relationship with their totem and their understanding of their ethical responsibilities. Finally the assembly could conclude with a commitment to ethical environmental behaviour in the future.



## Additional Resources

1. How are Australian Birds Protected by Law?
2. Birds as Indicators Case Studies
3. Bird Data Case Study
4. Bird Survey + Bird Identification Chart
5. Biodiversity Audit and Other Surveys
6. NSW Curriculum - Encouraging Native Birds
7. Related Childrens Literature
8. Where to Find Support for the Program



# How are Australian Birds Protected by Law?

There are many laws in Australia that protect Australian birds. It is against the law to mistreat or neglect animals in Australia. The laws preventing cruelty to animals are for both domestic and wild animals. Some laws specifically prevent wild birds from being harmed or killed (including destroying nests and eggs). There are also strict laws about hunting in the wild and it is generally forbidden to kill animals in domestic homes.

Other laws control activities that might have a short or long term impact on the food sources, nesting habitats and places where birds live as well as directly protecting the birds themselves. There are laws that focus on particular bird species or groups of birds (e.g. China – Australia Migratory Bird Agreement) as well as many laws that protect birds that are threatened with extinction (threatened or endangered species and even specific rare populations or colonies of birds (e.g. Little Penguin Colony in Manly in New South Wales).

Most wildlife protection laws and threatened species laws are predominately governed by the States and Territories. The following laws listed below (current in 2010) help to protect birds and their habitats throughout Australia:

For more information about how birds are protected in your local area you can contact local government or the environment department in your state.

## For more information about killing birds see:

RSPCA Fact Sheet on Control of Indian Mynas <http://kb.rspca.org.au/afile/140/6/>

## Commonwealth Laws

The Australia Government's primary piece of environmental legislation is the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act relates to the protection of the environment and the conservation of biodiversity. The Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places—defined in the EPBC Act as matters of national environmental significance.

Other national legislation may pertain to birds in certain areas, including for example the Antarctic Marine Living Resources Conservation Act 1981, an Act relating to the conservation of marine living resources of the Antarctic and its surrounding seas.



# How are Australian Birds Protected by Law?

## ■ Australian Capital Territory

The ACT's Nature Conservation Act 1980 provides for the protection and conservation of native animals and plants, and for the reservation of areas for those purposes. The Planning and Development Act 2007 also requires assessment of development proposals that may adversely impact on the status of protected species.

## ■ New South Wales

The National Parks and Wildlife Act 1974 consolidates the laws relating to the establishment, preservation and management of national parks, historic sites and certain other areas and the protection of certain fauna, native plants and Aboriginal objects in NSW. The Environmental Planning and Assessment Act 1979 institutes a system of environmental planning and assessment, and the Native Vegetation Act 2003 relates to the sustainable management and conservation of native vegetation across the State.

## ■ Northern Territory

The Territory Parks and Wildlife Conservation Act provides for the establishment of Parks and Reserves and the study, protection, conservation and sustainable utilisation of wildlife.

## ■ Queensland

Queensland's Nature Conservation Act 1992, in particular the Nature Conservation (Wildlife) Regulation 2006 provides for the conservation of nature.

## ■ South Australia

In South Australia, wildlife and threatened species are protected under the National Parks and Wildlife Act 1972. The Act allows for the protection of habitat and wildlife through the establishment of parks and reserves and provides for the use of wildlife through a system of permits. The Native Vegetation Act 1991 provides incentives to retain and encourage management of South Australia's remaining native vegetation.

## ■ Tasmania

Tasmania's Nature Conservation Act 2002 provides for the conservation and protection of the State's flora, fauna and geological diversity. The Threatened Species Protection Act 1995 provides for the protection and management of threatened native flora and fauna and to enable and promote the conservation of native flora and fauna.

## ■ Victoria

The Flora and Fauna Guarantee Act 1988 is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes. The Wildlife Act 1975 also promotes the protection, conservation and sustainable use of wildlife.

## ■ Western Australia

The Wildlife Conservation Act 1950 provides for the conservation and protection of wildlife. The use, protection and management of certain public lands, waters, flora and fauna is dealt with by the Conservation and Land Management Act 1984.





## Birds as Indicators Case Study

# Environmental Pollution



### 'Canaries' and Lead Contamination

In the past, miners carried caged canaries to warn them when gases down a mine were building up to deadly levels. Because the birds were highly sensitive to the poisonous gases, if they stopped singing and became lethargic, the miners knew that they had to get out of the mine fast, before they too were affected.

**This shows that birds can be very helpful in telling us about what is happening in the environment around us.**

In 2006, residents of Esperance (a busy port on the south coast of Western Australia) began reporting that some native birds were falling out of the sky, and that many others were found lying dead on the ground, scattered all around the town.

By March 2007, thousands of birds — mostly honeyeaters and nectar-eating Purple-crowned Lorikeets — had died, and the Department of Environment and Conservation discovered that the birds had been poisoned by a chemical known as lead carbonate. The chemical was also blamed for high levels of lead in the blood of the people who lived in the town.

Researchers used special tests (isotopes) to match the lead that they found in the poisoned birds (as well as in the soil and water from around the town) with the lead that was being transported by train to the port of Esperance.

### Focus questions for students:

- How does that make you feel? (Lots of birds died; people could have got very sick, the water could have become unsafe to drink etc.)
- What was the lead used for? Why do we need lead? (Lead carbonate is a white pigment that contains lead; it is used mainly in paints but also in certain cement, putty, paper, etc.) Why would lead in pellets be safer than lead in powdered form?
- What did the mining company do wrong? Why do you think they didn't do the right thing? Who pays for the damage done (e.g., the clean-up)? What did the government departments do wrong? (e.g., they failed to make sure that the license was being adhered to, and the lead was being transported safely)
- What can you do? (e.g. be alert for signs that things are not right in the environment; tell other people what you have learned; do not be afraid to complain if you think the environment is being damaged or people are at risk; watch/listen to the birds!).

By March 2007, thousands of birds, mostly honeyeaters and nectar-eating Purple-crowned Lorikeets — had died





The mining company responsible for digging up the lead carbonate (Magellan Metals) had been granted a licence to export it but was only allowed to ship it off in pelletised form (the size of a chocolate smartie); instead, they had been shipping it as a dusty powder. When the wind blew (as it often does in Esperance) clouds of the dust blew out of the railway cars and it blew all over the town, where it settled on everything. It even contaminated the flowering plants in people's gardens, and when the honeyeaters fed on the nectar of the flowers, they also ate some of the lead, which poisoned them.

A 2007 parliamentary committee inquiry into the contamination found that the mining company, the local port authority and two government departments failed to properly exercise their responsibilities.

Just like the miners' canaries, if honeyeaters had not started mysteriously falling out of the sky near Esperance, no one would have known that anything was wrong; they wouldn't have noticed that the town was contaminated with lead. Because the birds showed us that something was wrong, the problem was able to be fixed, and the town was cleaned up. If the birds hadn't died and alerted the town to the lead pollution, many of the people who live in Esperance, especially the children, would have become very sick from the lead that had poisoned their homes, their gardens, their schoolyards and even their drinking water.

Birds can tell us so much about what is going on our environment; what is going wrong with it, as well as what is going right. We just have to listen to what they say.

*Thanks to Contributors: Text Dr Penny Olsen Photos: Frank Spolc*



**Birds can tell us so much about what is going on our environment; what is going wrong with it, as well as what is going right. We just have to listen to what they say.**

### **Sources for teachers**

[http://portal.environment.wa.gov.au/portal/page?\\_page-id=157,6427791&\\_dad=portal&\\_schema=PORTAL;](http://portal.environment.wa.gov.au/portal/page?_page-id=157,6427791&_dad=portal&_schema=PORTAL;)  
[www.health.wa.gov.au](http://www.health.wa.gov.au)

### **Related reading for students**

Dr Seuss(1971)The Lorax. Random House (and other publishers).

Video online at: <http://video.google.com/videoplay?docid=6650219631867189375#>

### **Action:**

- Reduce the amount of chemicals you use in your school
- Conduct a chemical audit



[www.birdsaustralia.com.au](http://www.birdsaustralia.com.au)





## Birds as Indicators Case Study

# Habitat Alteration



Over time, with heavy grazing pressure, the plant community changes from a variety of native perennial grasses, and shrubs and trees to weeds and annuals.



### Grassland Birds and Grazing Pressure

There are three types of native grasslands: a grassland with no trees is called a 'grassland', a grassland with a few trees is a 'savannah', and a grassland with lots of trees is a 'grassy woodland'. These habitats once occurred across most of south-eastern Australia, and many native grazing animals, such as bandicoots, bettongs, wallabies and emus lived in them. Plants and animals in a grassland work together to help capture energy from the sun, recycle nutrients, and control populations, water and energy flows.

Many types of grasslands need some grazing or fire to keep them in top condition, but too much is bad for them. Most of the native grazing animals have been largely replaced by livestock, especially sheep and cattle. The number of grazing animals, the amount of time an area is grazed and the time of year it is grazed all affect the types of plants and animals that can live in an area. Over time, where there are lots of grazing animals eating the grass, the mixture of plants changes from a variety of native perennial grasses, shrubs and trees to just a few types of weeds and annual plants; many of the animals which need a wide range of plants disappear, while a few others may benefit. For example, in heavily grazed areas:

- birds such as quail that need tall grasses and tussocks are absent;
- large and/or bold birds such as Australian Magpies and Willie Wagtails are more common.

### Focus questions for students:

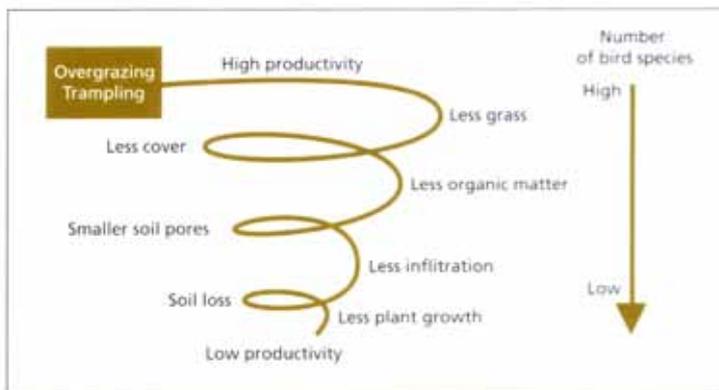
- Why do we need livestock? What do you eat? Why do you eat it? (nutrition, cultural tradition, taste)?
- Can cattle or sheep damage the environment? How? How can this damage be avoided?
- If a paddock has trees, would it be more likely to have birds than a paddock without any trees? Why?
- Would birds prefer a tidy paddock or a messy paddock (with fallen branches, leaf litter, rocks and scattered bushes)?
- Which types of grassland or parts of a paddock might suit different types of birds (e.g. where might you see a magpie, or a fairy-wren, or a quail?)
- Can you have a healthy environment with livestock and lots of birds and other animals? How?
- What are the benefits of low-medium stocking rates for farmers? (more feed during drought, less erosion, more birds to enjoy, etc.)
- Apart from grazing, what else might have an effect on birds and other animals in grasslands? (Other human modifications that can affect biodiversity in these grasslands include removing trees, using fertilisers, digging farm dams, planting crops and non-native pasture grasses, changes to burning regimes and the introduction of weeds.)
- What can you do? (e.g. tell other people what you have learned; do not be afraid to complain if you notice the environment is being damaged; watch/listen to the birds!).





Heavy grazing in grassy woodlands can cause trees to die from having their roots trampled, and young trees are also trampled, stopping them from growing into mature trees. When the trees disappear, so do many of the birds which used to live in them, so that fewer birds and fewer types of birds remain. Birds which often live in grassy woodlands include Superb Fairy-wrens, Yellow-rumped Thornbills, Eastern Rosellas, Red Wattlebirds, Black-faced Cuckoo-shrikes and Magpie-larks, and they all need trees and shrubs in the grasslands for food, shelter and safety from predators.

By having fewer grazing animals in an area, it can be good for the environment and good for the farmers as well. For example, by having fewer sheep or cattle in his paddocks, a farmer can encourage a greater variety of native grasses and other plants to grow, which usually means that there will be food available for the livestock even in the driest times. By encouraging more plants, it will also help to capture water which might otherwise run off and be lost, taking some of the soil with it.



In grassy woodlands subject to continued over-grazing, the diversity of woodland understorey and ground birds declines, as does farm productivity. Based on McIntyre et al. (2002), *Birds Australia's Birds on Farms survey*, Maron and Lill 2005

In general, a good variety of birds and high production values can be maintained on grazing land by using different methods of farming:

- Rotational grazing (moving livestock from paddock to paddock to graze, which allows some paddocks to recover)
- Low numbers of livestock in the paddocks throughout the year
- Stop grazing in some paddocks for a whole season to let the grasses seed
- Keeping a variety of different habitats on the farm, ranging from natural areas through to grassy paddocks or crops.

The variety, number and types of birds (e.g. key species) that live in farmland tell us how sustainable the farming methods used by the farmer are.

Thanks to Contributors: Text Dr Penny Olsen Photos: Frank Spolc



[www.birdsaustralia.com.au](http://www.birdsaustralia.com.au)

A diversity of plants and dense ground cover also help to capture water, which can otherwise run off and be lost, taking some of the soil with it.



### Sources for teachers

Dorrough, J., Stol, J. and McIntyre, S. (2008) *Biodiversity in the Paddock: A Land Managers Guide*. Downloadable at [www.csiro.au](http://www.csiro.au)  
 McIntyre, S., McIvor, J.G. and Heard, K.M. (Editors) *Managing and Conserving Grassy Woodlands*. CSIRO Publishing, Collingwood.

### Related reading for students

Gary Crew and Mark Wilson (2003) *I Said Nothing: The Extinction of the Paradise Parrot*. Lothian, South Melbourne (and other publishers).

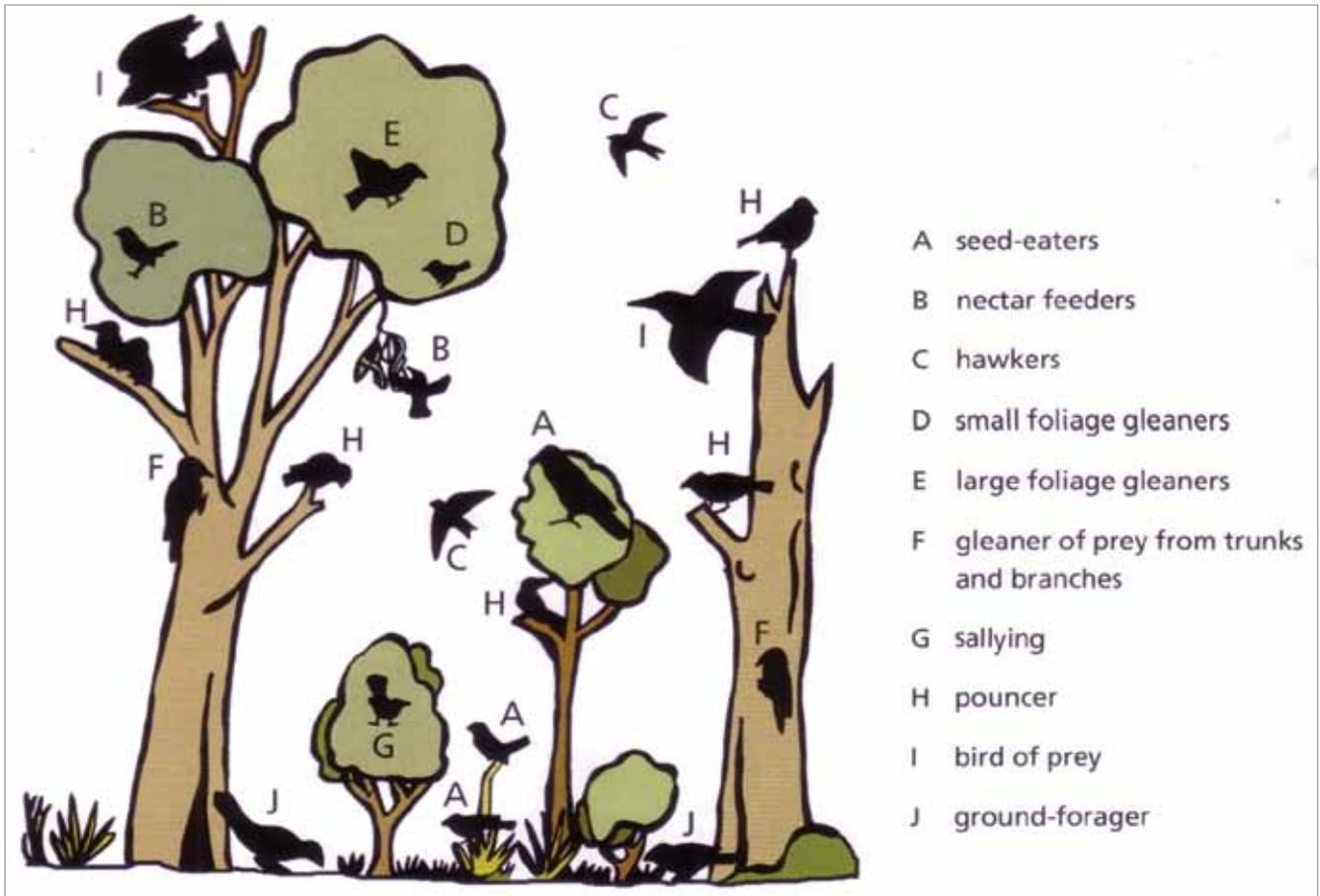
### Also:

Bonshaw Public School (2007) *Reggie The Regent Honeyeater*. Border Rivers Gwydir CMA.  
 Ann Parry (2006) *Civic Issues: Conservation*. MacMillan Education Australia, South Yarra.  
 Greg Pyers (2000) *Endangered Animals of Australia's Wetlands and Grasslands*. Echidna Books, Abbotsford.  
 Eleanor Stodart (2003) *Old River Red Gum*. Envirobook, Annandale.

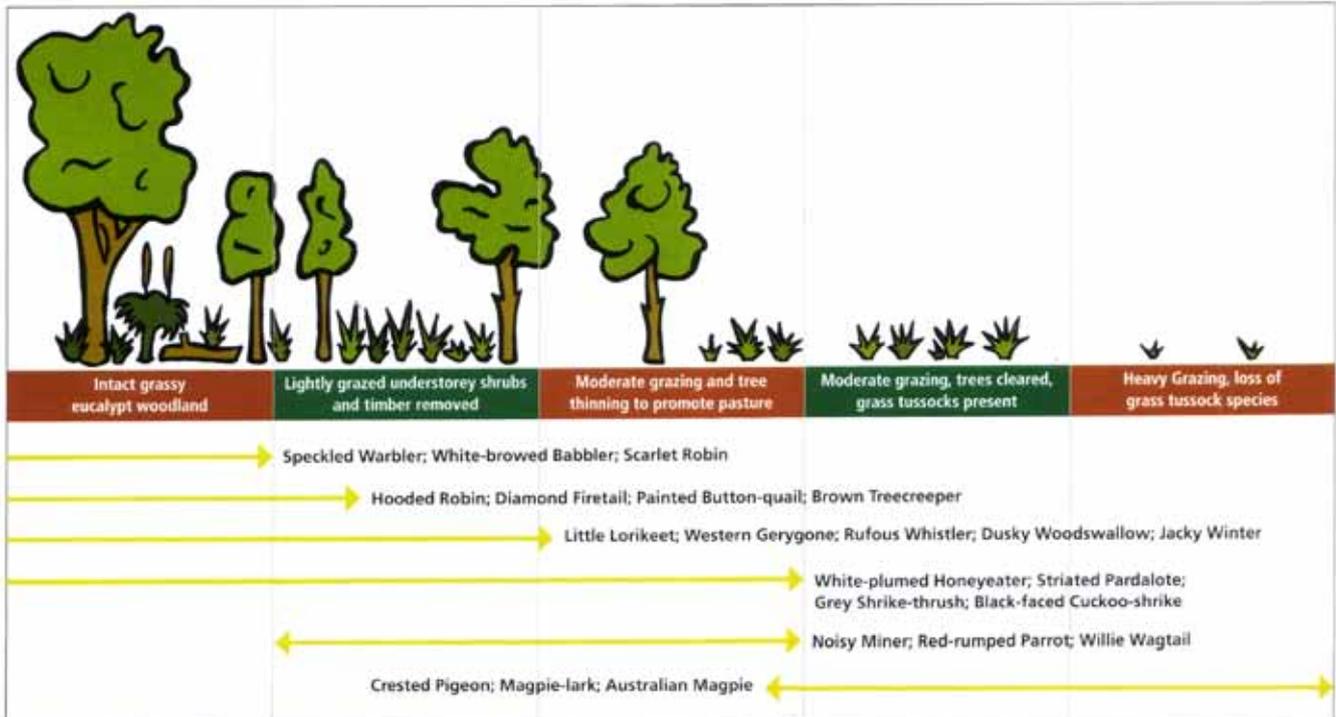
### Action:

- Create a NO-MOW zone in your school grounds.
- Watch the native grasses regenerate from the seed bank in the soil





A typical woodland profile, with taller trees, smaller trees and shrubs forming an understorey, and ground cover. Structurally intact woodlands such as this support a diversity of birds exploiting the various foraging opportunities offered. Redrawn from Williams and Woinarski (1997)



As grassy temperate woodlands are altered by grazing, clearing and clearing up, bird communities change from a variety of types that use woodland and its edge to a few open country species. Modified from Recher et al. (1986)





## Birds as Indicators Case Study

# Ecosystem Breakdown



### Cats, Rabbits and other Invasive Species ON Macquarie Island

Cats and rabbits are great pets, but when they occur in the wild, they can be a disaster, especially when they are both present together. This story shows us how nature is interconnected and what happens when people interfere with only one key part of the ecosystem in isolation.

Macquarie Island is a subantarctic Australian territory, and is home to many nesting seabirds, such as albatrosses and penguins. It was discovered in 1810 and was soon settled by sealers. Rats and mice jumped off the ships and began to eat the sealers' stores of food. Then cats were introduced to control the mice and rats. Later, the sealers released rabbits onto the island as another source of food.

As the rabbits multiplied, so too did the cats which ate them. Soon there were far too many cats and rabbits on the island.

By 1978 the rabbit population had increased to 130,000, and with so many of them there they began to have a severe impact on the island's fragile vegetation. With so many rabbits devastating the island, a special virus was introduced to reduce their numbers. By 1988 the number of rabbits had been reduced to fewer than 20,000, and soon the island's vegetation was on the road to recovery. With fewer rabbits to eat, the cats began to shift their attention to a different prey — the nesting seabirds.



With no cats, Grey Petrels soon returned to the island to breed after an absence of 100 years.

### Focus questions for students:

- Do you own a pet? What country did your pet originate from? How does your pet impact on the environment? (what does it eat, what do you do with its poop?)
- What can you do? (e.g. bells on pet cats; not letting cats wander; not dumping cats or pet rabbits in the bush)
- Why is pest eradication preferable to reducing pest numbers? Why is it not always possible?
- How can we lessen the damage caused by invasive animals on the mainland? (e.g. targeted trapping, poisoning, fencing, etc.)
- Why do some introduced animals (and plants) become invasive and others don't?
- How can we prevent invasion of islands? (e.g. make sure that we don't introduce animals, plants or diseases that don't belong there)
- Who should be responsible for stopping the spread of pests and lessening the impact of pests?





To deal with this looming conservation disaster, they started getting rid of the cats, and the last one was removed in 2000. With no cats, Grey Petrels soon returned to the island to breed after an absence of 100 years; Blue Petrels and Fairy Prions also came back from the safety of nearby islands.

However, the numbers of rats and mice began to rise as there were no cats left to eat them. There were so many that they began to kill the chicks of the albatrosses and the other seabirds. Also, the rabbit population, no longer kept down by the cats, exploded. They began to eat the island's fragile plantlife again, which allowed the soil to wash away during heavy rain. In 2006, with no plants left to stabilise the soil on the slopes, a landslide buried hundreds of King Penguins and their chicks, and caused many albatross nests to tumble down the hillsides. It was a disaster.

The conservation of Macquarie Island was affected by people dealing with only one part of the problem at a time, and forgetting that the problems were interlinked. By reducing the number of rabbits, they allowed cats to get out of hand and start killing seabirds, and when they got rid of the cats, this allowed the rabbits and rats and mice to run riot. What a disaster!

Now, finally the Government has implemented a program to remove rabbits, rats and mice from Macquarie Island. Hopefully the seabirds will soon be allowed to nest in peace.

## Gould's Petrels, rabbits, currawongs on Cabbage Tree Island

If the challenge of eradicating an invasive species from Macquarie Island is a daunting prospect, at 30 hectares, Cabbage Tree Island, off Port Stephens in NSW, is a much more manageable size. Cabbage Tree Island is the only place in Australia where the endangered Gould's Petrel breeds. Rabbits were introduced to the island in about 1906, and they quickly ate almost all of the grass and bushes that grew beneath the trees.

Because the rabbits had eaten these plants, Pied Currawongs (which often eat baby birds) could now easily grab and eat the petrel chicks. Also, with no bushes left, the sticky fruits of Bird Lime trees were able to fall all the way to the forest floor, where they entangled the petrels as they came and went from their nesting burrows. By the 1990s the population of Gould's Petrel had declined to fewer than 200 birds, and very few nests raised chicks.

The rabbits were removed from the island between 1997 and 1999, and the plants soon began to grow back. Some of the currawongs and the bird lime trees were also removed to give the petrels a chance to survive. In addition, by moving some large petrel chicks to nearby Boondelbah Island, a new colony of petrels became established there. Within 10 years there were over 800 petrels present on Cabbage Tree Island, and many of them were able to raise their young. It was a great conservation success, providing a model for how to look after other threatened seabirds, and the Gould's Petrel was the first bird species in NSW to have its status downgraded from Endangered to Vulnerable.

Animals which live on islands have often evolved in an environment where there are no introduced animals, and so they are vulnerable to being eaten by predators (like cats and rats) and their habitats may be destroyed by other animals (like rabbits) eating all the plants. In this way, the impacts of introduced animals on islands can be severe, and the same is true for mainland Australia, which is, after all, a big island. The flip side is that removing pest animals from islands is often easier because of the smaller area and the small chance of the introduced animals coming back. The lesson from Macquarie Island and Cabbage Tree Island is that we need to look at all parts of the problem, and not just one part in isolation.

Thanks to Contributors: Text: Dr Penny Olsen Photos: Frank Spott



[www.birdsaustralia.com.au](http://www.birdsaustralia.com.au)

Rabbits were introduced to the island in about 1906, and they quickly ate almost all of the grass and bushes that grew beneath the trees.

### Web resources for teachers

Gould's Petrel Recovery Plan. [www.threatenedspecies.environment.nsw.gov.au](http://www.threatenedspecies.environment.nsw.gov.au)  
 Gould's Petrel. Foundation for National Parks [www.fnpp.com.au](http://www.fnpp.com.au)  
[www.tnpa.asn.au/macquarie/Rabbitinducedlandslides2006.pdf](http://www.tnpa.asn.au/macquarie/Rabbitinducedlandslides2006.pdf)  
 Considine, M (2007) Politics add to Macquarie Island's pest problem. *Ecos* vol. 136, pp. 20–21.  
 Super-evolved mega-mice threaten island birds — 20 May, 2008. [http://blogs.nature.com/news/thegreatbeyond/2008/05/superevolved\\_megamice\\_threaten.html](http://blogs.nature.com/news/thegreatbeyond/2008/05/superevolved_megamice_threaten.html)

### Reading for students

Gary Crew and Gillian Warden (2008) *Cat on the Island*. Angus and Robertson, Sydney.  
 Jan Ramage and Laura Peterson (2004) *Eyes in the Night*. Cygnet Books, University of Western Australia Press, Crawley.  
 Anthony Hill and Jane Tanner (2009) *Lucy's Cat and the Rainbow Birds*. Puffin, Camberwell.

### Reading for teachers

Bergstrom, DM, Lucieer, A, Kiefer, K, Belbin, L, Pedersen, TK and Chown, SL (2009) Indirect effects of invasive species removal devastate World Heritage Island. *Journal of Applied Ecology* vol. 46, pp. 73–81.  
 Brothers, N and Bones, C (2008) The response of burrow-nesting petrels and other vulnerable bird species to vertebrate pest management and climate change on sub-Antarctic Macquarie Island. *Papers and Proceedings of the Royal Society of Tasmania* vol. 142, pp. 123–148.  
 Dickman, C (1996) Overview of the Impacts of Feral Cats on Australian Native Fauna. Australian Nature Conservation Agency, Canberra.  
 Norris, A. and Low, T (2007) Managing Feral Animals and Their Impacts. Australian Government, Canberra. ([www.environment.gov.au](http://www.environment.gov.au))  
 Taylor, RH (1979) How the Macquarie Island Parakeet became extinct. *New Zealand Journal of Ecology* vol. 2, pp. 42–45.  
 Wanless, RM, Angel, A, Cuthbert, RJ, Hilton, GM, and Ryan, PG (2007) Can predation by invasive mice drive seabird extinctions? *Biology Letters* vol. 3, pp. 241–244.

## Action:

- Make your school a BIRD SAFE zone.
- Create gardens with dense shrubs for small birds to hide from predators





# Birds as Indicators Case Study

# Bird Data



Each school was allocated an icon bird (indicator species) to monitor more closely over time as part of their School Environmental Management Plan (SEMP).

During 2008 nine schools conducted 66 surveys and recorded 29 bird species in their school grounds between April and November 2008 as part of the pilot project for 'Answering the Call'. Each school's data was divided into two graphs of "urban lovers" and "urban haters" to articulate the key urban bird conservation message: to address small bird decline in urban areas connection of habitat and provision of dense habitat and structural diversity was encouraged. Each school was allocated an icon bird (indicator species) to monitor more closely over time as part of their School Environmental Management Plan (SEMP). For example one school recorded Superb Fairy-wrens in their school. This is the "bird to watch" as there are threats to this species from habitat loss and feral predators. If the school can monitor this species over time and manage the school grounds to protect this species they will be contributing greatly to biodiversity conservation in the region.



## Species with Habitat Preferences

### Urban lovers

Maggie Lark  
Spotted Fantail  
White Wagtail  
Rainbow Lorikeet  
Galah  
Red Wattlebird  
Welcome Swallow  
Common Starling  
Common Myra  
Noddy Miner  
House Sparrow  
Common Blackbird  
White-plumed Honeyeater  
Rock Dove  
Australian Magpie  
Crested Pigeon  
Red-rumped Parrot  
Shrike  
Eastern Rosella  
Superb-crowned Cuckoo  
Toucan  
Black-faced Cuckoo-shrike  
Grey Butcherbird  
Brown Honeyeater  
Little Wattlebird

European Goldfinch  
Little Plover  
Singing Honeyeater  
Masked Lorikeet  
Golden-headed Cuckoo  
Cassowary Reed Warbler  
Laughing Turtle-Dove  
European Tree Sparrow  
Little Frigatebird  
Australian Hobby  
Song Thrush  
European Greenfinch  
Scary-breasted Lorikeet  
Sacred Kingfisher  
Yellow-rumped Thornbill  
Common Kestrel  
Blue-faced Honeyeater  
Red-wattled Tattler  
Brush Cuckoo  
Northern Kestrel  
Little Grassbird  
Little Lorikeet  
Purple-crowned Lorikeet  
Noddy Miner  
Butcherbird

### Urban haters

Golden Whistler  
Grey Shrike-thrush  
Grey Fantail  
Eastern Whipbird  
White-browed Scrubwren  
Eastern Yellow Robin  
Brown Thornbill  
Scarlet Robin  
Yellow-faced Honeyeater  
Red-browed Finch  
White-throated Tree-skipper  
Lewin's Honeyeater  
Common Rosella  
Superb Lyrebird  
Fan-tailed Cuckoo  
White-naped Honeyeater  
Australian King-Parrot  
Striated Thornbill  
Yellow-billed Honeyeater  
Wedge-tailed Eagle  
Satin Bowerbird  
Brown-Cuckoo-Dove  
Yellow-billed Black-Cuckoo  
White-eared Honeyeater  
Rufous Whistler

Shaded Fantail  
Superb Fairy-wren  
White-breasted Noddy  
Western Sparrow  
Spotted Fairy-wren  
Red-tailed Black-Cuckoo  
Western Rosella  
Hairy Thornbill  
Dusky Woodswallow  
Fuscous Honeyeater  
Buff-rumped Thornbill  
Brown-headed Honeyeater  
Crescent Honeyeater  
Australian Brush-sparrow  
White-headed Pigeon  
Brown Gerygone  
Grey Curlew  
Scarlet Honeyeater  
Weebill  
Rufous Fantail  
Bonaparte's Dove  
Spotted Pardalote  
Eastern Spinebill  
Laughing Kookaburra  
Red-winged Fairy-wren

Western Yellow Robin  
Western Thornbill  
Rufous Treecreeper  
White-winged Tiller  
White-tailed Black-Cuckoo  
Red-capped Parrot  
Satin Finlayson  
Pallid Cuckoo  
White-winged Gough  
Flame Robin  
Olive Whistler  
Topknot Pigeon  
Red-browed Treecreeper  
Sassaparilla Thrush  
Rose Robin  
Large-billed Scrubwren  
Shining Bronze-Cuckoo  
Tree Martin  
Wings Pigeon  
Duskybird  
Common Bronzewing  
Mistletoebird  
Variegated Fairy-wren  
Spangled Drongo  
Pied Curlew

## How Are Birds Indicators of Sustainability?

- Biodiversity / Species Richness
- Fragmentation / Presence Absence
- Imbalance / Invasive Species
- Climate Change / Seasonal Movements
- Chemicals / Food Chain Bioaccumulation
- Habitat Quality / Waste / Water Management Behaviour
- Development / Historical Records
- Culture / Arts and Music



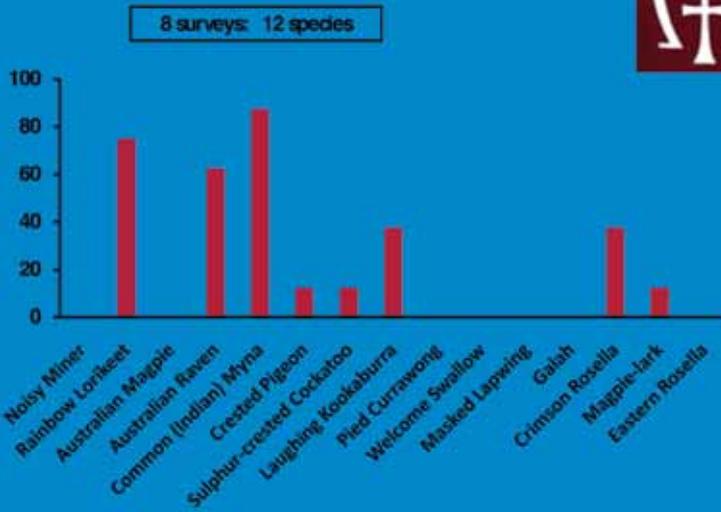


In addition some schools had low bird diversity so instead examined bird behaviour as an indicator of the health of their school environment. Two schools observed Australian Ravens foraging on rubbish in the playground. They took action and established recycling programs, composting and worm farming and engaged other students in the school with a “compost rap”.

As a result of interpreting their observations the students at all nine schools: installed nest boxes and bird baths; implemented no mow zones to encourage native grasses; planted 3000 native plants; and reformed the schools' waste management practices.

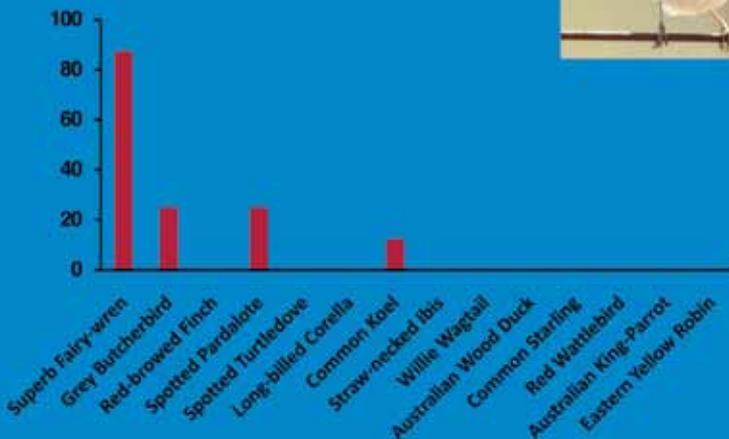
Thanks to Contributors: Text Aimee Freimanis Photos: Frank Spolz

## Marian College



If the school can monitor this species over time and manage the school grounds to protect this species they will be contributing greatly to biodiversity conservation in the region.

## Marian Fairy-wrens



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# Where to find support for the program

## Answering the Call

Answering the Call provides teachers with curriculum support and activities for students, however much of the program will be site-specific and learner-driven so we cannot provide prescriptive advice in this document that will be relevant to all schools in Australia.

We recommend schools support the program through building relationships with mentors in their local area. There are many agencies and individuals who have environmental expertise and can provide advice and support besides Birds Australia.

- **Australian Sustainable Schools Initiative (AuSSI)** is a federal government initiative to support schools to become more sustainable. <http://www.environment.gov.au/education/aussi/>
- **Local Government** often have school networks, funding programs and environmental activities for schools to participate in.
- **Outdoor/Environmental Education Centres** run many excursions and in-school support programs and are usually based in natural settings. They provide expertise in environmental education and training.
- **Bird Clubs** are your best bet for expert advice on the birds local to your area. They are volunteers often with decades of experience, handy hints on when and where to see birds as well as being able to help define identify what makes good bird habitat and interpret bird behaviour.
- **Environment Groups** are many and varied and include large organisations such as World Wildlife Fund for Nature as well as localised small volunteer groups. Environment Groups can help explain environmental issues and suggest actions your school community can take to create a sustainable school.



# Where to find support for the program

## Answering the call as a complete package

**Answering the Call** is a Curriculum Resource for teachers which can be used as a stand alone document for teaching, however to maximise the effectiveness of this program we recommend that schools **contact Birds Australia on 1300 730 075** to participate in other activities.

### We recommend schools participate in an Education Package:

- Curriculum Resource
- Teacher Professional Development Training
- School Excursion
- In School Support
- Data Analysis

Birds Australia is currently partnering with other environmental education providers around Australia including: Sydney Olympic Park Authority, Bird Observation and Conservation Australia and the Gould League. We are also working with the NSW Department of Education and Training Environmental Education Centres in NSW and many local bird clubs to build local Communities of Practice.

We encourage schools to work with other schools, community groups and local government in their region to ensure that the program is well supported and to share resources, learning and outcomes.

## Funding for the program

Birds Australia is a not-for-profit organisation and as such relies on the generosity of our supporters through membership, donations, corporate sponsorship and government funding for our programs.

We invite interested schools, communities, corporations and individuals to contact us to discuss financial support arrangements. Currently the full program can be purchased for \$1000 per school which includes a FREE Birds Australia membership for the school, where they will receive quarterly copies of our award winning magazine Wingspan as well as stickers, brochures and discounts.

**Contact our Education Coordinator to enquire about the program on (02) 9647 1033 or email [a.freimanis@birdsaustralia.com.au](mailto:a.freimanis@birdsaustralia.com.au)**



# Related Childrens Literature

## Living sustainably

Sarah Edwards (2008) *Go Green*. Macmillan Education Australia, South Yarra.

Goldie Alexander and Kenneth Brown (2007) *Save It!* Macmillan Educational, South Yarra.

Patrick O'Callaghan and Bettina Guthridge (1991) *Things Kids Can Do to Save the Earth*. Mammoth Australia, Port Melbourne.

## Biodiversity protection/good citizenship etc

Ann Parry (2006) *Civic Issues: Conservation*. Macmillan Education Australia, South Yarra.

Greg Pyers (2010) *Biodiversity in Woodlands*. Macmillan Education Australia, South Yarra.

Sharon Dalglish (2007) *Our World Our Future*. Macmillan Education Australia, South Yarra.

Robert Ingpen and Margaret Dunkle (1987) *Conservation: Preserve Our World for the Future*. Puffin Books, Ringwood.

Jo Readman (2006) *George Saves the World by Lunchtime* Eden Project Books

Lauren Child (2002) *What Planet are you from Clarice Bean?* Orchard Books

Christobel Mattingley (1992) *The Battle of the Galah Trees* Hodder & Sloughton

*The Enviro Kids of Sandy Bay* (2000) Lexington Avenue Press

Michael Foreman (1992) *One World* Red Fox

## Change/Monitoring/Action

Graeme Base *Uno's Garden* Penguin/Viking

Christopher Cheng Steven Woolman (1997) *One Child Era*

David Spillman Mark Wilson (2001) *Yellow Eye Era*

## Extinction

Gary Crew Mark Wilson (2004) *I Did Nothing: The Extinction of the Gastric-Brooding Frog* Lothian

Gary Crew *Cat on the Island* Angus & Robertson

Gary Crew & Mark Wilson (2003) *I Saw Nothing: The Extinction of the Thylacine* Lothian

## Bird Specific

Pauline Reilly and Kayelene Taylor (2004) *Eudyptula the Little Penguin*. Bristlebird Books, Anglesea.

Christobel Mattingley (1999) *Cockawun and Cockatoo* Puffin

Margaret Wild Gwyn Perkins *Baby Birds Blankie* (2008) Kingswood S Aust: Working Title

May Garelick Trish Hill (1988) *What makes a bird a bird?* Martin Educational Sydney

Colin Thiele Roger Haldane (1990) *Magpie Island* Weldon Sydney

Matt Cosgrove (1999) *Birds, Birds and More Birds* Weldon Kids Sydney

Kim Dale (2005) *Little Tawny* Lothian South Melbourne

Pamela Allen (2000) *Mr McGee and the Perfect Nest* Puffin Ringwood

## Water/wetlands

Rochelle Strauss and Rosemary Woods (2007) *One Well: The Story of Water on Earth*. ABC Books, Australian Broadcasting Commission, Sydney.

Jane Person (2007) *Water: Where Does it Come From?* (Echidna Books), Binara Publishing, Carlton. (Big book on the water cycle)

Caren Trafford and Megan Eriksson (2004) *Water...The Amazing Journey*. Etram Pty Ltd ([www.planetkids.biz](http://www.planetkids.biz))

Michael and Jane Pelusey (2006) *A Water Report; Water Conservation*. MacMillan Education Australia, South Yarra.

Inverell Public School, Yr 2 (2007) *From the Country to the Beach*. Border Rivers Gwydir CMA.

Bonshaw Public School (2007) *The Dumaresq River*. Border Rivers Gwydir CMA.

Toomelah Public School (2007) *The McIntyre River at Toomelah*. Border Rivers Gwydir CMA.

Bingara Central (2007) *Finding Home: A Tale of the Brolgas*. Border Rivers Gwydir CMA.

Ross Hill Public School, Class 4LR (2007) *The Adventures of Two Ducks*. Border Rivers Gwydir CMA.

Sir Henry Parkes Memorial School (2007) *Two Creeks in One*. Border Rivers Gwydir CMA.

## Plant protection

Eleanor Stodart (2003) *Old River Red Gum*. Envirobook, Annandale.

Jill B. Bruce and Jan Wade (2000) *Where Have All the Flowers Gone?* Kangaroo Press, East Roseville.

## Heritage

*National Estate for Kids*. Australian Heritage Commission. GPO Box 1567, Canberra, ACT. (1991 – may be out of print)

## Feral Animals

Jan Ramage and Laura Peterson (2004) *Eyes in the Night*. Cygnet Books, University of Western Australia Press, Crawley.

Gary Crew and Gillian Warden (2008) *Cat on the Island*. Angus and Robertson, Sydney.

Margaret Wild Ron Brooks *Fox*

## Barbed wire fences

Inverell Public School, Yr 2 (2007) *Glenda the Squirrel Glider*. Border Rivers Gwydir CMA.

# Biodiversity Audit

A student centred activity to describe the biodiversity of a school focussing on mini-creatures, birds, other animal and plants.

## Mini-creatures

It is important to examine the mini-creatures that live in the school grounds, as these creatures are food for larger animals.

Using magnifiers, identification charts and observation clues, examine the mini-creatures that live in the school grounds. Although some creatures cannot be seen, there is evidence of their presence. Include these on the list (e.g. if you see a spider's web, record *spider* on your list).

Take care when moving logs or disturbing leaves, and put everything back in its place when you have finished. Select **three** sites to do this.

Site 1 Location: \_\_\_\_\_

Mini-creature	Where found?	How does it use the school grounds?
(e.g. worm)	Under a log	Feeds on decaying leaf litter

- How many mini-creatures were found? \_\_\_\_\_
- What conditions do they like? \_\_\_\_\_
- How can you attract more of these creatures into the school grounds?

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## Birds

Complete a bird count in the school grounds. Allocate groups of students to different areas of the school. Do **three** counts: **early in the morning, in the middle of the day and at the end of the day.**

Where possible, identify the bird and count how many specimens of each. Determine if the birds are native or introduced species. Record how they are using the school grounds.

Bird	Tally	Native or introduced?	How were they using the school grounds?
(e.g. Noisy miner)	<del>1111</del>	Native	Getting nectar out of the grevilleas

- What is the total number of birds? \_\_\_\_\_ Can you see nesting sites? \_\_\_\_\_
- How many native birds? \_\_\_\_\_ How many introduced birds? \_\_\_\_\_
- Why do you think birds are attracted to the school grounds? \_\_\_\_\_  
\_\_\_\_\_
- List strategies to encourage more native birds into the school grounds  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Other creatures in your school

There are many creatures in the school grounds that come out only at night. To find out what they are, it is necessary to set up some "traps". The creatures will not be hurt in these traps, but you must ensure they are released in the same spot where they were captured, after you have recorded them on your audit sheet.

### Pitfall traps:

- Dig a hole in the ground.
- Place a container in the hole and ensure the top of the container is flush with the soil level.
- Make a raised roof to go over the container, in case it rains overnight. Four rocks and a lid are ideal. If the school has a sandpit, smooth the sand, place some food in the middle and check for footprints the next day.

Record your information on the following chart:

Name	No. of specimens	Why are they attracted to the school grounds?

- Are there scratch marks on the trunks of trees? \_\_\_\_\_
- Name some creatures that could have made these marks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- List the creatures that have a negative impact on the school grounds.

## Flora

The type of flora will influence the animals that are attracted to the school grounds.

On a map of the school, draw the plants located in the school grounds. Note if the plant is a tree, shrub or ground cover.

• How many trees in the school grounds are over 30m in height  
Are they healthy (look at the tree's crown for clues)? \_\_\_\_\_

If not, why? \_\_\_\_\_

• Do they provide shade? \_\_\_\_\_ Are there shrubs and ground covers? \_\_\_\_\_

• Tally the number of shrubs and ground covers.

Record if they are native, bird-attracting (with flowers and dense foliage), are a source of bush foods or are fragrant.

Name	Native	Number of specimens	Bird-attracting	Bush foods	Fragrant
(e.g. grevillea)	Yes	++++	Yes	Yes	Yes

- Do the trees create enough shade? \_\_\_\_\_
- Is there enough vegetation to attract animals to the school grounds? \_\_\_\_\_
- Suggest ways to increase vegetation and attract more animals:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_









## Encouraging Native Birds into the School

<b>ISSUE:</b> Absence of native birds in the school grounds <b>GOAL:</b> To increase the number of native birds in the school grounds <b>STRATEGY:</b> The restoration of habitat						<b>CURRICULUM INTEGRATION:</b>	
<b>Performance indicators</b>	<b>Action to be taken</b>	<b>Action checklist (tick)</b>	<b>Who is responsible?</b>	<b>When will it be completed?</b>	<b>Cost</b>	<b>Relevant KLA</b>	<b>Teaching and learning strategies to be undertaken</b>
Community participation and cooperation	Formation of a School Grounds Management Committee (SGMC)		The School Environmental Management Committee (SEMC)	Term 1		HSIE	Visit an area of local bushland and complete the following: <ul style="list-style-type: none"> <li>• a bird count</li> <li>• description of the birds</li> <li>• a record of the behaviour of each bird</li> <li>• examination of ecosystems: record the species of plants, soil types etc., and all the things necessary for the birds to survive.</li> </ul> After the visit, list the features that could be replicated in the school grounds. Give this information to the SGMC.  Scan the Internet or liaise with the local Landcare group to make a list of suitable plants.
	Determine the most suitable plants to attract birds and where to place them.		Students, teachers, Landcare	Term 1			
	Notify school neighbours of the plan to attract native birds to the school		Principal	Term 2			
Greater student and community involvement	Invite the neighbours to a student presentation of the plan		SGMC, students	Term 2		English	Write to the neighbours informing them of the plan; invite them to a meeting.  Prepare an oral presentation and present it to the neighbours. Invite a local bird expert to address the meeting.
	Suggest ways the neighbours could assist (e.g. keep cats in at night)		SGMC, students	Term 2			
	Prepare area for planting		Teacher, general assistant, students P&C	Term 2		Mathematics	Determine the size of the area to be planted; record the size of selected plants. <i>How many plants are required to fit in the selected area?</i> Pass this information to the SGMC.

<b>ISSUE:</b> Absence of native birds in the school grounds <b>GOAL:</b> To increase the number of native birds in the school grounds <b>STRATEGY:</b> The restoration of habitat						<b>CURRICULUM INTEGRATION:</b>	
<b>Performance indicators</b>	<b>Action to be taken</b>	<b>Action checklist (tick)</b>	<b>Who is responsible?</b>	<b>When will it be completed?</b>	<b>Cost</b>	<b>Relevant KLA</b>	<b>Teaching and learning strategies to be undertaken</b>
Increased habitat	Purchase plants to attract birds (e.g. red flowers, dense and prickly)		Teachers, general assistant, P&C	Term 2	\$250	Creative Arts	Produce a pamphlet informing people why it is not appropriate to feed wildlife. Decorate and print copies for each student in the school. Place the information on the school's web site.
	Plant in clumps to protect birds		Students, general assistant, teachers, P&C	Term 2			
	Maintain and monitor plants		General assistant, students	Ongoing		Science & Technology	Examine the designs of bird boxes. Construct bird boxes using recycled materials. Discuss with the SGMC suitable sites to locate the boxes and set them in place.
	Examine and select the most appropriate bird box designs		Stage 3 students, teachers	Term 2			
	Construct bird boxes		Stage 3 students and teachers	Term 2	Recycled materials \$200	English	Make large posters featuring birds and display around the school. Have each bird saying why the school grounds are important to it.
	Place bird boxes in appropriate sites		Stage 3 students and teacher	Term 3			
	Monitor the number of birds that use the bird boxes		Teachers, students, general assistant	Term 4			"Attracting birds to our school grounds will make our time at school more enjoyable". Write a discussion text including arguments for and against this statement.
More native birds in the school grounds	Complete a bird count and compare the results with the biodiversity audit		Teachers, students	Term 4		Mathematics	Do a bird count at the end of the year and compare it with the results from the audit. The variation could be seasonal. It will be necessary to do counts next year.

## **CASE STUDY: BIRDS AS INDICATORS OF CHANGE IN THE MARINE ENVIRONMENT**

### **LITTLE PENGUINS, AUSTRALIAN GANNETS AND FISH STOCKS**

At sunset on Summerland Beach on Phillip Island, Victoria, hundreds of Little Penguins emerge from the sea and march across the beach to their burrows in the dunes. At the crack of dawn they march back to the ocean. A major prey, which they hunt by day, is pilchards, also known as Australian Sardines, which are also harvested by humans.

Nearly every night since November 1978, rangers and others have made 50-minute counts as the penguins headed home for the night. Over the thirty or years, penguin numbers fluctuated, but three periods were apparent:

- the first (to 1987) was of rapidly decreasing penguin numbers mostly related to predation by foxes and dogs and road deaths;
- the second period (1987–1993) was of increasing numbers following extensive control of fox and dog numbers, and traffic exclusion; and
- the third period followed the widespread mortality of pilchards, in 1995 and again in 1998. Since then pilchards have featured less in the penguin's diet and penguin numbers have improved again (to about 640 individuals) but, so far, have not returned to the previous peak (around 750).

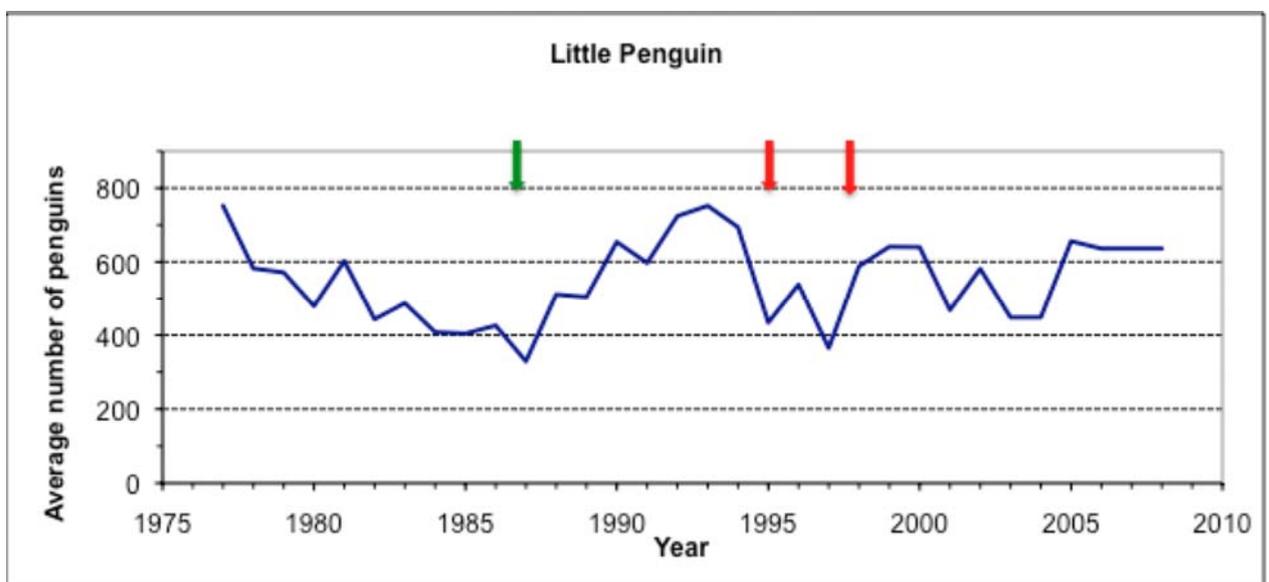
The penguin's story illustrates the interconnectedness of nature. In the early years of penguin counts at Summerland Beach, the population of little black and white birds was suffering high numbers of deaths to predators and traffic near the colony. Once these threats were managed penguins numbers increased rapidly. Then, in the autumn of 1995, vast numbers of pilchards washed up dead on Australian beaches and the penguin population again fell.

It took some years to identify the cause of the mass fish die-off, which killed as much as 60% of the pilchard population, from Western Australia to Victoria. A herpesvirus carried by another species of pilchard from overseas, imported as food for farmed tuna in South Australia was identified as the source. The disease spread rapidly in 1995 and again in 1998 until the pilchard population gained immunity and recovered. Little Penguins and aerial diving seabirds such as the Australasian Gannet, and presumably predatory fish, suffered high breeding failures from the scarcity of pilchards. In 1995 and 1998, the pilchard fishing industry acted responsibly, putting in

place closures that prevented commercial catches of sardines until the population recovered.

In 2009, the total commercial pilchard catch from NSW, Victorian and Commonwealth waters was about 3000 t per year, perhaps 8–12% of the sardine population, and there is a recreational bag limit of 50. The fish are sold for bait, pet food and human consumption, either canned or fresh. The industry appears to be sustainable but pilchard numbers are hard to monitor because the fish are mobile and it is difficult to know whether the size of the harvest is a true reflection of the population size.

Congregations of seabirds have long been used by fishermen to locate shoals of fish. The penguins eat small pilchard but Australasian Gannets prefer adults, also sought after by fishermen. Research has shown that the percentage of pilchards in the diet of the gannets mirrors the fisheries catch: the more the birds are eating, the bigger the commercial catch. This suggests that the birds and the harvest are telling us (measuring) the same thing and the diet of the gannets may be a useful index of fish stock abundance.



**The average annual number of Little Penguins crossing Summerland Beach, Phillip Island, each night between 1977 and 2009 (based on *The State of Australia's Birds* report 2008; [www.birdsaustralia.com.au/SOAB/](http://www.birdsaustralia.com.au/SOAB/)). The green arrow indicates when management of predators and traffic commenced and the red arrows are pilchard die-offs.**

### **Possible questions for students**

- What can be done to prevent another outbreak of disease in the fish? (e.g., control the import of bait/wild fish food and/or ban transportation of bait fish within Australia)
- What can the birds tell us about the fish they prefer to eat?
- Why would it be good to use the diet of a bird as an independent measure of the size of the pilchard population? (e.g., an independent check on the management of fish stocks the industry would provide more certainty that the catch is sustainable)
- When pilchards became rare, the penguins were able to switch prey, eating more barracouta, but there was a cost – what was it? (see the graph: the penguin colony has never recovered to former numbers—it seems to do best when the birds eat lots of pilchards)
- What might happen to the birds if fish stocks stayed low for a long time?
- How would you measure the diet of the birds? (penguins and gannets breed on land, and bring fish back to the colony; they regurgitate the catch when they are disturbed or about to feed chicks; a sample can be collected without harming the birds)
- The pilchard fishing industry seems to be sustainable, but if you thought that the pilchards were being overfished, what could you do? (e.g., not buy pilchards from the fish shop, or tuna, if it was fed on pilchards)

### **Sources for teachers**

Bunce, A (2004) Do dietary changes of Australasian Gannets (*Morus serrator*) reflect variability in pelagic fish stocks? *Wildlife Research* vol. 31, pp. 383–387.

Bunce, A and Norman, IF (2000) Changes in the diet of Australasian Gannets (*Morus serrator*) in response to mortality in Pilchards (*Sardinops sagax*). *Marine and Freshwater Research* vol. 51, pp. 349–353.

Dann, P, Norman, FI, Cullen, JM, Neira, FJ and Chiaradia, A (2000) Mortality and breeding failure of Little Penguins, *Eudyptula minor*, in Victoria, 1995–96,

following widespread mortality of Pilchards, *Sardinops sagax*. *Marine and Freshwater Research* vol. 54, pp. 355–362.

NSW Department of Primary Industry (2006/7) Australian Sardine (*Sardinops neopilchardus*). Wildlife Fisheries Research Program (<http://www.marine.csiro.au/caab/>).

Whittaker, RJ, Crockford, M, Jordan, D and Jones, B (2008) Herpesvirus that caused epizootic mortality in 1995 and 1998 in Pilchards, *Sardinops sagax neopilchardus* (Steindachner), in Australia is now endemic. *Journal of Fish Diseases* vol. 31, pp. 97–105.

### **Related reading for students**

Warner Brothers (2006) *Happy Feet: The Movie Storybook*. Warner Brothers (and the movie)

Pauline Reilly and Kayelene Taylor (2004) *Eudyptula the Little Penguin*. Bristlebird Books, Anglesea.

# ResourceSmart Certification Tool

## Biodiversity

School: \_\_\_\_\_

Date: \_\_\_\_\_ Verifying Facilitator: \_\_\_\_\_

**Aspirational Habitat Improvement Target:**

50% from baseline year  
or  
Increase habitat quality score to >75 within the schoolground\* or in an area close to the school  
(see 'Biodiversity Up Close' audit tool at [www.landlearn.net.au](http://www.landlearn.net.au))

and/or

**Aspirational Environmental Weeds Reduction Target:**

60% from baseline year

### How to use this Certification Tool

Use this Certification Tool for **Biodiversity** to check your school's progress in this resource module.

1) When you have fulfilled the required number of "practices present" contact the Victorian Association for Environmental Education at [vaae@vaae.vic.edu.au](mailto:vaae@vaae.vic.edu.au) or 03 9349 1806 for a ResourceSmart AuSSI Vic facilitator to verify your achievements.

2) When verified, apply for a **Certificate of Achievement in Biodiversity** or for **ResourceSmart 5Star Sustainability Certification** contact Sustainability Victoria at [schools@sustainability.vic.gov.au](mailto:schools@sustainability.vic.gov.au) or 03 8626 8700.

**ResourceSmart 5Star Sustainability Certification** is a five star process. See the ResourceSmart website for details - [resourcesmart.vic.gov.au](http://resourcesmart.vic.gov.au).

## A: Workplace/ Daily Operations

### A1 Systems Design & Management All practices present

Towards best practice activities	Examples/Comments
Biodiversity (school ground) assessments undertaken, including identification and recording, using accepted media/data collection methods (e.g. LandLearn's Audit Tool "Biodiversity up Close")* of: <ul style="list-style-type: none"> <li>▪ indigenous/native plants and animals</li> <li>▪ habitat quality (trees, understorey, ground cover weeds and soil management)</li> <li>▪ linkages of school vegetation and habitats with surrounding areas</li> </ul>	
Baseline data completed and on School Environment Tracking System (SETS)	
Use of DEECD's advice to principals to help support targets (Administrative Guidelines) or similar systemic initiatives for Catholic & Independent Schools	

### A2 Development and Planning At least two practices present

Towards best practice activities	Examples/Comments
Whole school biodiversity improvement development plan in place covering any or all of: <ul style="list-style-type: none"> <li>▪ planting schedules</li> <li>▪ protection of mature and local species</li> <li>▪ weed and pest control and arbor management</li> </ul>	List

Professional development for staff on biodiversity and associated themes	
The school has applied for biodiversity related grants and/or entered environmental awards and competitions (e.g. ResourceSmart Schools Awards)	

**A3 Biodiversity – Management, Maintenance & Monitoring** All practices present

Towards best practice activities	Examples/Comments
Mulching and weed control and litter management regularly undertaken in school grounds and gardens	
Garden waste composted or mulched/chipped	
Environmentally sensitive soil management processes and stormwater management for school grounds in place	
All flora and fauna are regularly inspected to monitor for health and subsequent actions determined to promote biodiversity	
Biodiversity monitoring systems in place and baseline data (index) updated annually on SETS	

**A4 Biodiversity - Enhancement & Protection** At least six practices present

Towards best practice activities	Examples/Comments
School ground or bushland area biodiversity index/rating increasing following regular auditing (where feasible)	List
Conservation area and remnant vegetation maintained and protected (where applicable)	
Habitat development areas established or underway along with aesthetic works to enhance the school yard (e.g. frog bog, sensory gardens, wildlife corridors, wildscapes, nest boxes, butterfly gardens)	List
Planting regimes in line with school plan and local considerations (local provenance planting, drought tolerance)	List
Development of raingarden	
Appropriate fencing and guarding (especially sensitive areas)	
Nature trails and interpretive signage evident	
Vegetable and/or food gardens and/or animal husbandry activities established	

**A5 Biodiversity – Litter** All practices present

Towards best practice activities	Examples/Comments
Yards and other areas are litter free and have signed rubbish bins with/out lids (as appropriate) or no bins	
Meals eaten in designated eating areas or classrooms or process to minimise litter in yard (e.g. no wrapped food outside)	
System in place to collect litter in yard (not used as a punishment activity)	

## B: Learning and Teaching

**B1 Landcare, Habitat, Ecology and Sustainable Land Management** At least seven practices present

Towards best practice activities	Examples/Comments
There is an action plan which clearly targets classroom activities across the school to address school sustainability in biodiversity and/or local land care and/or natural resource management, habitat and ecology issues in policy/curriculum (see LandLearn (DPI))	
Clearly targeted classroom activities in biodiversity and/or land management issues and/or sustainable food production that match the students' stages of learning and personal development	
Classroom activities in biodiversity and/or land management issues and/or sustainable food production are clearly linked to outcomes in the Victorian Essential Learning Standards	

<p>Learning and teaching in the classroom are linked to practical, 'hands-on' activities that encourage:</p> <ul style="list-style-type: none"> <li>• use of the school grounds as an authentic learning space for nature-based, informal, outdoor learning about biodiversity and land management (e.g. vegetable and food gardens, husbandry activities)</li> <li>• improvement in biodiversity within the school grounds and/or local areas</li> <li>• excursions to provide students with first hand experience of land management, coast management (or environmental management), conservation sites and/or earth education centres, botanical gardens, conservation, wildlife and community education centres, zoos and endangered species</li> <li>• links to home-based projects and behaviour change in biodiversity, Landcare, habitat, ecology and/or sustainable land management</li> </ul>	
School curriculum provides students with the opportunity to take responsibility for classroom activities and programs in land management, land care, animal and habitat care issues and school ground planning.	
Interactive ICT resources used by students to gain information on and increase understanding of biodiversity, biodiversity and/or Landcare issues and/or sustainable farming	
School engages indigenous learning perspectives in curriculum development and relates this to biodiversity	
Incursion to provide students and teachers with knowledge and motivation around biodiversity	
Guest speakers as part of in-school education programs on biodiversity, Landcare and/or sustainable land management	
Using SETS as a curriculum activity to monitor progress in biodiversity in the school grounds and/or local areas	

## C: Whole School Community Engagement

### C1 Policy and Reporting All practices present

Towards best practice activities	Examples/Comments
Biodiversity policies, targets and action plan approved by School Council/planning committee	
Regular communication of biodiversity, Landcare, habitat, ecology and sustainable land management activities and programs provided to the whole school (e.g. reports at school assemblies, annual school reports, newsletters, displays and end of year assemblies, parent teacher night presentations, School Council reports)	
Regular feedback on the biodiversity, Landcare, habitat, ecology and sustainable land management activities and programs sought from the whole school (students, staff, parents, School Council/committee and school support personnel)	
At least one case study of school success completed and uploaded onto school/departmental/sustainability website	
Sustainability education in biodiversity included as a priority or focus area or emphasis in the school goals (in School Plan, Policy, Administration and/or Curriculum Charts)	
School events incorporate support/maintenance of biodiversity	

### C2 Student and Parent Leadership At least two practices present

Towards best practice activities	Examples/Comments
Students involved in planning and managing the biodiversity and school grounds program (e.g. Student Action Teams)	
School environment leadership through students instituted in the school	
School Environment Club active	
Parents and other members of the school community assist in the planning and management of the biodiversity module	
Parents and other members of the school community assist in implementing actions of the biodiversity module	

**C3 Community and Communications Links** At least four practices present

Towards best practice activities	Examples/Comments
School liaises and/or works with local government or regional authorities and groups to develop school-based and joint projects	
Staff and/or students attend local environmental network meetings	
Staff and/or students participate in local biodiversity and/or conservation project/activity to support and maintain local landcare, habitat, ecology and sustainable land management activities and programs (e.g. Landcare Australia, Keep Australia Beautiful, Coast Action, Coastcare, LandLearn, local Catchment Management Authority programs, Clean-Up Australia Day, Weedbusters)	
School community and groups of students support wildlife protection and conservation projects by raising funds – e.g. sponsoring an endangered animal, contributing to the World Wildlife Fund (WWF), propagating and/or donating trees to property owners	
Questions about the attitudes and changes in home biodiversity behaviour included in annual parent surveys and wider school community surveys	
Ideas and activities for being more biodiversity aware and active at home included in school newsletters to families	
Staff and/or students mentor other schools	
Students and staff open dialogue about biodiversity related issues with other schools across the nation and globe	
Staff and/or students give presentations on their school biodiversity and landcare, habitat, ecology and sustainable land management activities and programs to other schools	
School liaises with political representatives from local, state and federal governments and local business and local 'friends of' groups for support for projects	

**End of Certification Tool  
Biodiversity**

This school has completed the required tasks for certification in the ResourceSmart AuSSI Vic Biodiversity Module.

School's Name: \_\_\_\_\_

Principal's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Facilitator's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Sustainability Victoria wishes to acknowledge CERES  for the development of this resource.

