



**Biodiversity is life
Biodiversity is our life.**

Biodiversity in the Garden

Newcomers, invaders, losses and action

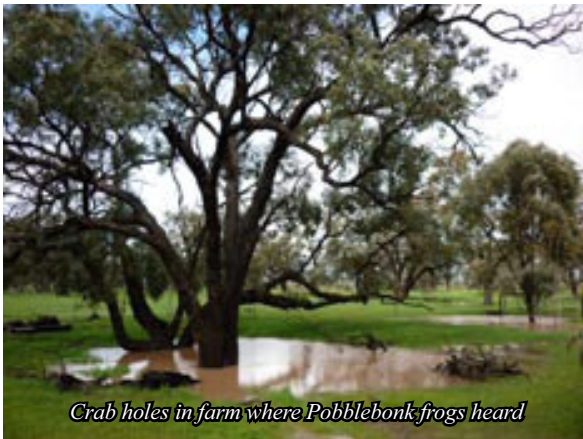
By Jeanie Clark

This article is the final in a series that began with 'Biodiversity in your Garden' in Otherways Jan 2010.

Spring

Isn't Spring exciting? Whether you think you know your backyard and/or garden well, there are sure to be surprises! Our surprise came from hearing 'bonk' coming over the plains. Heavy rainfall for the first time in over a decade brought Pobblebonk Frogs out of hibernation!

Have unexpected species of plants or animals appeared at your place too? Have familiar ones returned? Are you missing something familiar? How can you help your children know what to expect of biodiversity locally over the seasons and years, especially with the prospect of changes from climate? Firstly, when you notice it, draw your children's attention to it. See if they can recognise a cause for this 'newcomer'. Then find some way to record it. If you have been making visual records (drawings, photos) of the biodiversity in your backyard this year, you could try collating them into a calendar for next year.



“Bonk”

Pobblebonks, or Eastern Banjos, are quite a common frog and their distinctive 'bonk' call carries some distance, so this makes them easy to learn to recognise. 'Frogsongs' like this can be found on the web as well as lots of information about frogs. If they are close enough, you can use a mobile phone to record your own too. You can use a camera to photograph or video the habitat that they are calling from, and anything else of interest, like egg rafts and tadpoles.

Frogs are great to focus on for teaching about biodiversity.

They go through their lifecycle with changing predators and needs for shelter and food from the habitat around them. Sustainable populations are likely to need help from humans by maintaining the plants and water.

Is 5000 eggs laid per female Pobblebonk a lot? How many frogs are really around? It is actually hard for two of those 5000 to reach maturity. To care for biodiversity, we need to understand what threats they face. You could investigate the environment for predators, loss of habitat (water needs to last six months for many tadpoles to metamorphose into frogs), weather and human interventions, intended and accidental. (Please note that eggs and tadpoles should not be removed from their location.) How does burrowing deep into the soil help frogs survive dry years? How long can they last between wet enough times?

Frog eggs at Glenlee by Sarah Reichenbach (age 13)



There are many good frog sites on the web, eg www.frogsaustralia.net.au includes 'The Australian Frog Network Frog Database' which includes lists of known threats to each species.

Why do frogs matter? Frogs have been nominated as an indicator species – if they are present in numbers, they indicate that the environment is healthy enough to provide them with shelter and food (as part of food webs), most of which means other living things, or better biodiversity.

How should we help? Making a 'frog friendly' garden is about providing suitable habitat. Help can be found from Catchment Management Authorities (CMAs) or from the Amphibian Research Centre's <http://frogs.org.au> Your CMA may also have a Frogwatch program, which may provide training for surveying frogs. Protection from or removing introduced predators (like cats) is also needed.

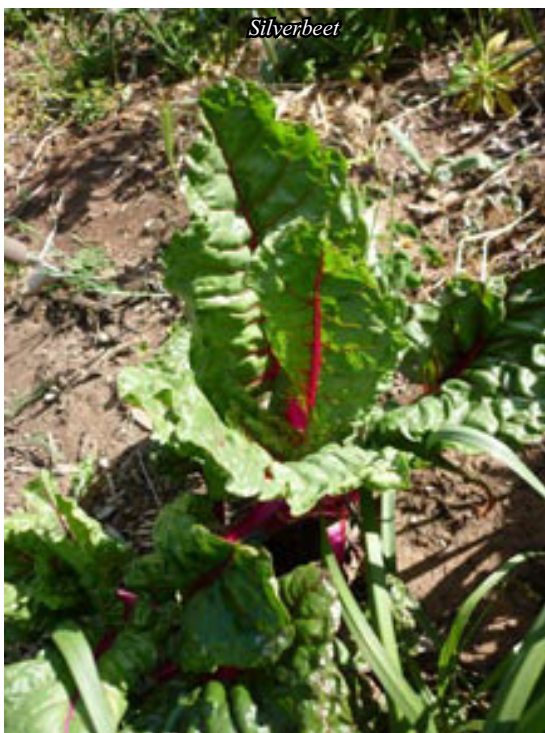
Vegies

If you are like us, then you have had a direct impact on changing the biodiversity of your backyard by planting a vegetable garden. Do you know where the species of

plants have come from that you have planted? Have you considered how important global biodiversity is in making it possible for you to choose plants that were not native to Australia to grow in your garden for food or pleasure?

Before the Europeans arrived in Australia, our land had no carrots, cabbages, potatoes, tomatoes etc, in fact most of the vegetables that we eat today. How many immigrant vegetables do you eat? Humans have made a huge change to the continent-wide diversity of plants that now live here. If you have a globe, and a vegetable patch, take your children out there (after you have done the research!) and ask them which plants they think are part of Australia's indigenous biodiversity? (If you don't have a vegie patch, then you could use food pulled from a shopping bag!)

Then go through each one and show them which part of the world each comes from. If you have some blu-tack, you might like to do (small) drawings of the key features of the plants in your garden. These can be stuck onto the world to show the region/county of origin. You will find that the Mediterranean, Americas and Middle East feature strongly. You might like to discuss if these plants should be considered newcomers, immigrants, or invaders! (You can do this for other plants and animals.)



Silverbeet

One of the reasons why biodiversity is important to humans is because it is like a treasure chest of things that may be useful to us, but we don't yet know about. The plants that we eat are available to us today because of the biodiversity of other parts of the world, especially in the past. So introduce the idea that what we have left of indigenous plants in wild places, and natural parks is still important. Each is a treasure chest, that may contain things not only valuable for their own existence and the food chains that they are part of, but because they may contain things that we may find useful in the future.

Bush tucker

How important is local knowledge? Local edible plants and animals are often called 'bush tucker'. Do you know about Nardoo - a common water plant in Australia that is a 'bush food'? 150 years ago, Burke and Wills died at Cooper's Creek. The local Aboriginals introduced the explorers to Nardoo. It was plentiful along the Creek, but needed preparation before eating. The explorers didn't learn these skills well enough and could not properly digest the Nardoo that they ate. Had they been able to, they need not have died there. Lesson 16 of the State Library of Victoria's Burke and Wills' Education Kit is about Nardoo. (go to www.slv.vic.gov.au/explore/student-teacher-resources/burke-and-wills-education-kit).

Do you know about the bush tucker in your local area? Is there a Koori contact organisation that you could invite to come and speak to your local group about this? You may be surprised at what you learn! For example, we were surprised to find that Native Pigface was used in summer as 'Powerade' is today, ie to replace fluids and salts.



Native Pigface

Debating issues in biodiversity takes place in the adult community. Discussion can help prepare children for adult life. Many simple biodiversity questions involve knowledge, a variety of aspects and consideration of values. For example, consider 'roo' v lamb: Why is this plentiful meat ('roo') not our national dish? Why do we shoot 'roos' and leave them to rot, instead of eating them? Which is a healthier meat: 'roo' or lamb? Which makes less impact on the environment: 'roo' or sheep? If you have eaten 'roo', how did it compare with your favourite lamb dish? What if MacArthur had not brought sheep onto his farm, but instead seen the kangaroos on his property as food and built his business on them? Did sheep invade the kangaroos' land?



Bambi lamb by Michael Clark

Disappearances

How much of the world's environment has been changed from its natural biodiversity to satisfy the food needs of various peoples? What have the impacts of that been? Most will have involved the near, or total, destruction, of the local biodiversity to bring in new species, often as a monoculture. Via food chains, loss of habitat means that species can become extinct. This is often the focus of studies on biodiversity with iconic species being studied.

I believe that the meaning of biodiversity should not be skewed to only look at issues of extinction and losses. To me, biodiversity is more than that. Through this year's series, I hope to have given you positive ideas. I believe that to tackle the problems foreshadowed for the world by climate change, sustainability and food security, we will need people who will appreciate the complexities of biodiversity. I think that children can learn better by observing the world that IS around them, and not just focussing on what is being lost or already gone. By acting locally, and caring for what we have that is good, our children will be helping to save our biodiversity globally. Hence, this series has not focussed on extinctions.

For extinctions and threatened species, there are many websites, to choose from once you choose which species you want to focus on. Often the information will be too complicated for younger children, so I would advise looking first yourself. The DEECD can help to find appropriate websites if you use its search engine [//fuse.education.vic.gov.au](http://fuse.education.vic.gov.au) and set the level you want first and use 'threatened' as well as 'endangered' species for your search. Many Science and Geography text books will have chapters on this issue. Zoos also have some education programs that focus on endangered animals. These can be found on the web before a visit, eg. the Learning Log for Healesville Sanctuary shows a trail for this on the www.zoo.org.au/Learning/Programs

Invasions

Did you find any newcomer species in your backyard? Do you consider them to be invaders? Is it native (eg Australian Plague Locust) or foreign (eg European Wasps)? Is it planned (eg silver beet in my garden) or accidental (eg Cape Weed in my 'lawn')? What should you do about this with your children? Does it help them understand why we have quarantine rules?

A high profile invading species is the Cane Toad. Timelines and mapping could be used to understand this history. Try it from the following summary. Sugar cane was one of the plants brought from South Africa on the First Fleet. It was sent to Norfolk Island for planting and later brought back to the mainland. In fits and starts, it progressed from Port Macquarie to Queensland over the next half century. Clearing land to plant any crop greatly reduces the local biodiversity as it creates a mono-culture (one plant in its place). But some indigenous things do survive, and when they compete with or use the introduced crop, they become 'pests' and 'weeds'. So it was in northern Queensland where the sugar cane replaced tropical rainforest.

Two local native beetles lost their food supply. They developed a taste for the invader and turned to sugar cane roots! They became such a pest that solutions were sought from across the world to deal with them. In 1935 an amphibian was brought from its home in Central America as a predator for the beetles, but not enough research was done - the Cane Toad became an even bigger threat to biodiversity than the Cane Beetles had been to the Sugar Cane crops. Why? The beetles could go safely out of reach from the Cane Toads at the top of the sugar cane; the Cane Toads found more tasty foods to eat both in and out of the cane fields and had no predators here to keep their population down. Now as the Cane Toad range continues to grow north, west and south, they pose a real threat to the biodiversity of places we seek to keep natural, like Kakadu. Meanwhile back in Central America, the Cane Toad's habitat is being destroyed, and it is starting to look like it will become 'threatened' there!

For student activities, see www.ento.csiro.au/aicn. The CSIRO's secondary school student's magazine 'Helix' had an article on Cane Toads in April this year (p 5, issue 131). Accompanying activities "Cane-tastrophe" are available from the Helix Teacher's Guide (p4-5, issue 131), available online from www.csiro.au/files/files/peoc as a pdf. They involve English, History, Science research, and Design. The 'Australian Insect Common Names' website is good for research on insects, including as pests.

How can you act locally on invasions? The first step is to be able to recognise one, eg do you have a South African invasion in your backyard's biodiversity? If you have Cape Weed, then you have! Cape Weed, from South Africa, arrived in Perth by ship accidentally in the 1830s. It has flourished, invading huge areas of Australia. Should we fight back? How? Pull it out? Mow it down? Poison it? Encourage competing indigenous or preferred introduced plants? You can research the alternatives from websites like the 'Herbiguide' and 'Environmental Weeds Action Network'. For learning with your children, you can find out about the plants you have in your backyard, draw them, research them and then plan how to tackle anything that your biodiversity would be better without! Plan what to put in its place – locally sourced if possible, eg replace Cape Weed with a local Wallaby Grass!

What about discussing what is best to do with the locusts? All poisons fatal to them are also fatal to the bees, frogs, etc that are living in the same land that the locusts pass through. It is a worthy discussion topic for older children to find out about these poisons and follow through the food webs that



can be affected. Is it really worth the cost to the whole environment in the longer term to poison the locust and save the crops this year?

How can we teach our children to consider changes in biodiversity long term? Studying the history of successful invaders could help develop the understanding that without predators, introduced animals become invaders and pests, eg rabbits, cats, foxes, camels, Brumbies.

Megadiversity

Although Australian biodiversity has problems along with the rest of the world, we also have a lot that is positive. We are one of 17 'megadiverse' countries (ie the group with 70% of the world's biodiversity but only cover 10% of the land (see www.environment.gov.au/biodiversity .) How well do these countries, shown on the website map, match with the major global biological zones (biomes)? Is there enough coverage to sustain global biodiversity into the future? The key biomes are: desert, tundra, grasslands, taiga, deciduous forest, rainforest, and water-based wetlands, coasts and marine. Information about them can be found in an atlas, geography books or websites like www.kidcyber.com.au/topics/biomes.htm .

'Global' Action

So we come to the world scale. We have observed the biodiversity in the garden, changed it and protected it. What can we do on the global scale? The Convention for Biodiversity has made an acrostic "BIODIVERSITY" list to suggest "What you can do" (see box at right).

What it comes down to is that we should "act local, think global" ie. look after what is close to you and value it. What about using this list to create your own poster with just one action for each letter relevant to you? Whatever you do, please keep positive by focussing on what there is to enjoy in biodiversity, while improving for the future.

Reflection

Perhaps as this year comes to an end, you might like to reflect, with your children, using the U.N.'s goals for the International Year of Biodiversity.

"Pre-amble - Humans are part of nature's rich diversity and have the power to protect or destroy it.

Discovery 1- Biodiversity, the variety of life on Earth, is essential to sustaining the living networks and systems.

These provide us all with health, wealth, food, fuel and the vital services our lives depend on.

Discovery 2- Human activity is causing the diversity of life on Earth to be lost at a greatly accelerated rate.

These losses are irreversible, impoverish us all and damage the life support systems we rely on everyday.

But we can prevent them.

Discovery 3 -2010 is the International Year of Biodiversity. Let's reflect on our achievements to safeguard biodiversity and focus on the urgency of our challenge for the future. Now is the time to act."

What you can do

Believe that you can make a difference; read Books on Biodiversity.

Inform yourself. The Internet is a great place to start, find out more at www.cbd.int

Observe the natural world around you... it can be something as small as the ants on the floor or the spider in the corner

Do your part, Dig a garden, Delve into the subject, Develop your knowledge about biodiversity issues, Delight in different varieties of foods

Interest your family and friends; Initiate a biodiversity project at school or in your community

Volunteer to work on a biodiversity project; Value traditional knowledge, practices, foods and medicines

Educate yourself, your friends and family; Examine your surroundings to see what you could do to improve them

Respect biodiversity in all its forms; Reduce consumption and waste, Reuse, Recycle

Study hard and become a Scientist, a biologist, an agronomist, an ecologist, a forestry expert; Share your knowledge; live Sustainably

Involve yourself in an environmental NGO or your country's committee for the international Year of Biodiversity

Talk to and Teach others about biodiversity loss.

Yes, YOU can do it... if we each do our part without waiting for others to do something first. **YOU** start, others will follow

from 'The Convention on Biological Diversity' (CBD website. For more see <http://www.cbd.int/convention/>



Wimmera Home Educators Group preparing vegetables for planting

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