OUR PLACE IN THE COUNTRY:

Managing your acreage property in West Brisbane

Pullen Pullen Catchments Group
A Landcare Group

Moggill Creek Catchment Group

"Our Place in the Country: Managing your acreage property in West Brisbane" (2009) was written and produced by members of the Pullen Pullen Catchments Group Inc. and the Moggill Creek Catchment Management Group Inc. with the support of a Gambling Community Benefit Fund Grant and Brisbane City Council.

Contributions to the content of this booklet were made by: Vicki Campbell, Gordon Grigg, Bryan Hacker, Amanda Maggs, Jenny Mulchrone, John Ness, Adrian Webb, Andrew Wilson and Graeme Wilson. Information contained herein is a guide only.

Editors: Adrian Webb and Bryan Hacker

Further copies of this booklet are available free of charge from:
Pullen Pullen Catchments Group: contactus@pullenpullencatchment.org.au
www.pullenpullencatchment.org.au

Moggill Creek Catchment Management Group:
mccgsecretary@live.com.au
www.moggillcreek.org.au

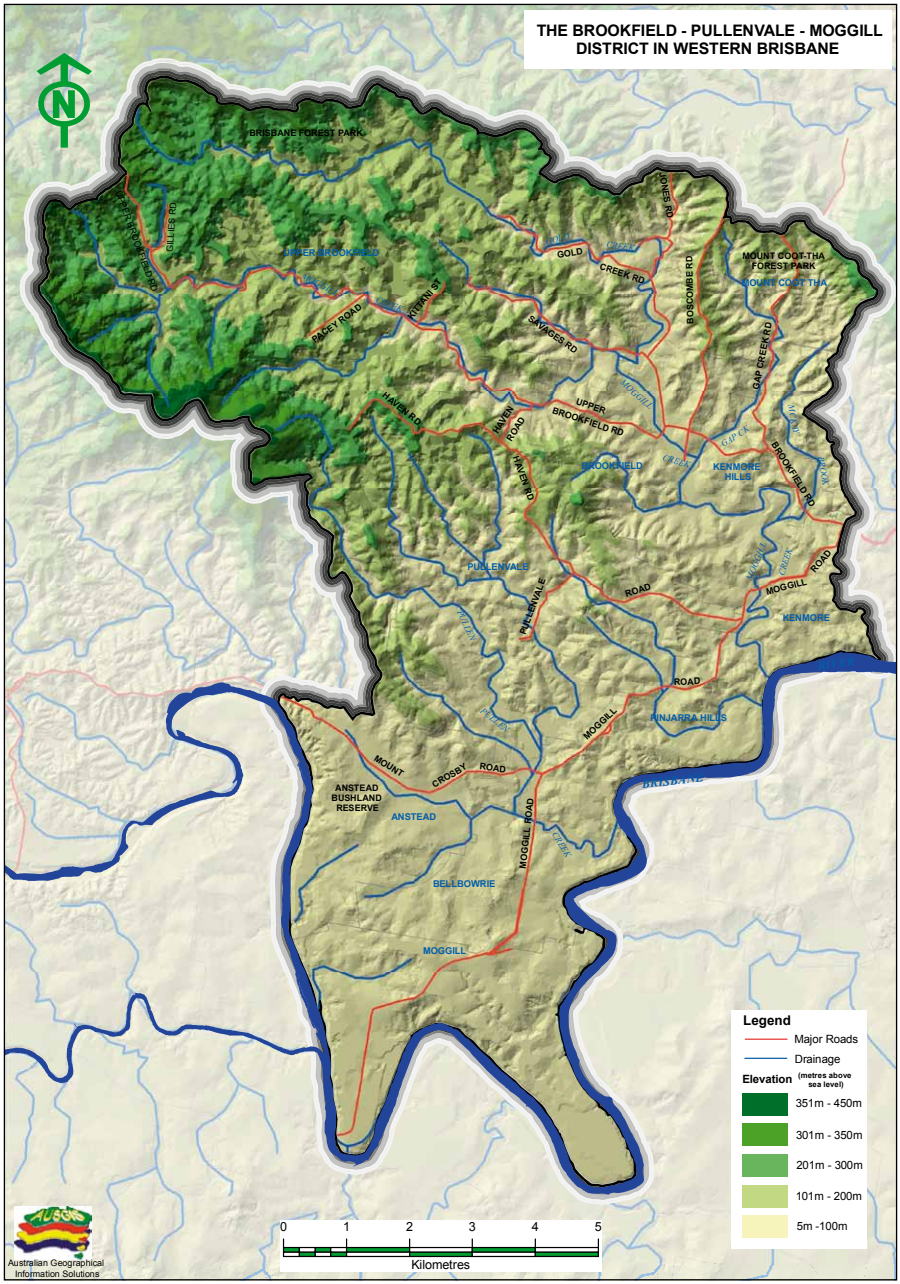
Photo Credits: Grahame Clarke (GC), Jutta Godwin (JG), Bryan Hacker (BH), Chris Hosking (CH), Amanda Maggs (AM), Irene Robertson (IR), Ray Seddon (RS)

Drawings: Brian Dean

Map: David Gooding, AUSGIS

Gambling
Community Benefit Fund
Queensland Government

BRISBANE CITY
Dedicated to a better Brisbane



The area of south-west Brisbane covered by this booklet

{CHAPTER 1}
Introduction

Residents in the Pullen Pullen and Moggill Creek catchments, and adjoining areas in west Brisbane, live in one of the most pleasant areas of the City. Population density is low, with typically large blocks, absence of heavy or concentrated industries, only one major arterial road through the area and a large proportion of tree covered land, both private and public.

In these districts, farming is fast fading with only vestiges of the once large pineapple, small crops and stock holdings still remaining. Much has already been converted to urban areas with concomitant increases in the built environment and traffic flows. Some land has been left to revert, not necessarily to pristine bush, but rather to become nurseries for weeds.

It is well documented that actions at the property scale can have detrimental ecosystem effects at the catchment scale through erosion, sedimentation, flooding, water pollution and habitat destruction. We know also that these detrimental effects can degrade the environment at river basin and continental scales, and there is increasing evidence of effects at the global scale. It is widely believed that changes in climate are associated with human activities. There is widespread support for implementing environmental management actions at local scales to reduce these adverse

Pullen Pullen Creek (Photo AM)

effects. In the Moggill Creek and Pullen Pullen catchments and nearby areas adjacent to the Brisbane River, Catchment Groups are heavily involved in promoting environmentally sensitive management activities at the property scale, such as bush regeneration, erosion protection, weed control and management of water to limit pollution of the streams.

This booklet was developed by the Pullen Pullen and Moggill Creek Catchment Groups in response to a wide range of questions asked by residents of the district on how best to manage their own land and how to help with the overall conservation of the flora and fauna of the district. These two Catchment Groups have been very active since 1998-99, promoting and participating in good environmental practices in the district.

In this booklet, the scene is set with a brief description of the geography, geology and history of the district, then the flora and fauna. Important aspects of bush regeneration and riparian zone management are then discussed in the section entitled "Managing your own property" under a series of questions asked by landholders. The major issue of weeds and how to avoid adding to the problem is the subject of the next section, followed by a section on managing wildlife, feral and domestic animals.

Appendices include descriptions of relevant environmental organizations, and information on Brisbane City Council's Wildlife Conservation Partnerships Program.

Gold Creek, a tributary of Moggill Creek, Brookfield (Photo: BH)

{CHAPTER 2} Geography, Geology & History

A catchment is the total area of land drained by a particular creek, stream or river and is usually made up of a number of sub-catchments. Catchments are separated by more or less elevated ridges. As water drains off the land it flows into streams, and then into larger creeks and rivers, carrying sediments, nutrients and pollutants downstream with it. Thus, the quality of the water in the streams effectively provides a measurement of the overall environmental health of the catchment.

The area covered by this booklet includes the catchments of Pullen Pullen and Pullen Creeks, Farm Creek, Moggill Creek and its tributaries and smaller drainage lines that flow into the Brisbane River (see Map on page iv). All of these are just a small section of the Brisbane River catchment and any sediments from this district flow into the Brisbane River and ultimately into Moreton Bay. The Moggill Creek catchment covers some 55 km^2; the Pullen Pullen Catchments Group provides support for a similar area.

The health of our waterways is about much more than just the quality of the water. Healthy waterways are living systems, where many factors interact to produce a balanced and productive ecosystem with a high diversity of plant and animal species. They are also resilient

and can naturally recover from certain amounts of damage from either human inputs such as pollution, or natural events such as floods.

Problems occur when input from one of the many interacting factors gets 'out of balance' with the rest of the system. For example, increased levels of nutrients from sewage effluent and stormwater inflow can lead to excessive algal growth, or 'blooms', choking waterways and killing wildlife. Residential development leads to an increase in hard surfaces (roofs, roads and driveways), which in turn leads to an increased rate of stormwater runoff, exacerbating flooding.

Understanding the changes and trends in the condition of our waterways also requires ongoing evaluation. Studies of water quality have been conducted on Pullen Pullen and Moggill Creeks and their tributaries. A 2001 report summarised findings for Pullen Pullen Creek and Kangaroo Gully, with "Very Good" or "Good" water quality at all five sites assessed. Studies over the period October 1999 to May 2002 showed "Very Good" or "Good" water quality in Moggill Creek, upper Gold Creek, lower Gap Creek and McKay Brook, but "Average" or "Poor" in lower Gold Creek and upper Gap Creek, the latter perhaps associated with disturbance.

In 2006 the Council commenced a citywide waterway health assessment program which monitors 48 sites using a range of measures including monthly chemical measures of water quality, seasonal measures on algae and pathogens and annual measures on fish and vegetation. Two of these sites are in Pullen Pullen Creek, and one in Moggill Creek. Results from this study have not as yet been released (April 2009).

The Aboriginal landscape

For tens of thousands of years, the plant and animal life of the Pullenvale-Moggill district provided resources for the Turrbal and probably Yugara Aboriginal people. It is likely that the name 'Pullen Pullen' is a corruption of the Aboriginal term 'bullen bullen' derived from 'bul' and meaning tournament. There were up to five such ceremonial or bora sites in the district and the outlines of one on the slopes of Mt Elphinstone remained visible until the late 1950s. The word 'Moggill' is derived from the Yugara name for the water dragon and these are still common along both creeks

The European landscape

European settlement in the area started with pastoral leases and farming, which attracted settlers in the late 1840s with the production of crops such as cotton, corn, potatoes, pumpkins and peaches. However, it was the opening of the John Williams coal mine at Moggill in 1848 that made the area more attractive to European settlers. The 1857 flood damaged much of the mine, but by this time the coal seam had been largely exhausted and mining ceased in the early 1860s. The search for coal in the area continued irregularly and the Riverside coal mines opened at Moggill in 1925 and operated until 1968.

From the 1840s, logs of hoop pine, cedar and eucalypts were hauled by bullocks to the Moggill Creek "rafting" ground where they were chained into rafts and floated downriver to Brisbane sawmills. When the plentiful hoop

pine stands and scattered cedars had been removed by the mid-1870s, the hardwoods, including various eucalypts, supplied bridge piles and paving blocks for city streets. Intermittent logging of eucalypts continued until World War II. Graziers, farmers and miners followed the timber getters, taking advantage of the extensive clearing.

From the mid-1850s Moggill Road was central to development, although growth faltered when the Ipswich railway was taken across the river at Indooroopilly, bypassing Kenmore and Moggill. By 1870, most arable land along Moggill and Gold Creeks had been cleared and was used for agriculture and horticulture. In 1881, the rural centre of Kenmore had a European population of 215; by 1947 it had risen to 525 and after the Second World War this area boomed, with a population of 5,646 in 1966. The Brookfield-Gold Creek-Pullenvale area had an estimated permanent population of only 95 in 1881 and 879 in 1947. Two decades later, it had risen to 2,624.

Local farms were mainly small-scale dairying operations and crops such as cotton, corn, arrowroot, potatoes, pineapples, custard apples, bananas, pawpaw and sugar were also grown. Today, the main crops grown in the Pullen Pullen catchment are fodder and pineapples, with some raising of poultry. As the name suggests, Gold Creek was the site of gold exploration and mining. By 1866 a number of prospectors were working along the creek, seeking alluvial gold. Renewed interest during the 1920s opened a number of mines in the Brookfield area but the optimism and hard work resulted in few, if any, payable deposits and mining was abandoned by the end of 1936.

Brisbane's need for more water than could be supplied by the 1866 Enoggera Reservoir saw the completion of construction of an earth dam on Gold Creek in 1886. When a water treatment plant was built at Enoggera Dam in 1912, a tunnel was driven through the separating ridge from Gold Creek Reservoir to form one water supply, piped to The Gap and Ashgrove. The stepped spillway construction of Gold Creek dam is of considerable historical engineering interest and more information about it can be found at these websites: http://www.uq.edu.au/~e2hchans/gold_crk.html and http://espace.library.uq.edu.au/view/UQ:9217.

By the 1940s, Kenmore residents had water and electrical services but most of Brookfield and Upper Brookfield remained rural until the subdivision of holdings into hobby farms or large residential blocks from the 1970s.

Although Upper Brookfield and Moggill have remained quite low in population density, in other suburbs in the district such as Pullenvale and Brookfield growth rates have been quite high over the past decade or so. The population in the Pullen Pullen Creek catchment is now around 9,600 and that in Moggill Creek catchment is about 15,400 with Bellbowrie and Kenmore each having around half of the total population for each catchment.

Geology and Soils

The geology and soils of the area are extremely variable and this has had a considerable influence on both the naturally-occurring vegetation and the plants that can be grown readily.

North of an East-West line roughly following the Mount Crosby Road, the rocks are classified as the 'Neranleigh Fernvale beds'. These comprise highly variable sediments deposited below sea level around 370-290 million years ago. They are formed of greywacke and argillite with patches of quartzite, bands of greenstone and some phyllite and tuff. Strata are often near-vertical, resulting in high levels of variability over short distances.

To the south of the East-West line, the rocks are more recent – about 220 million years old – and are described as the 'Ipswich Coal Measures'. They largely comprise sandstones, siltstones and shales, with some coal.

Soils are dependent on the parent rock and erosion and deposition processes, which are related to topography. More recently, farming and grazing have also affected soils in the district. The area along the western watersheds of the Moggill Creek catchment is hilly, with steep slopes and, through millennia of erosion, the soils have become very thin. They are generally infertile, supporting eucalypt woodland, but where the parent rock is more fertile, dry rainforest occurred and still exists in a few pockets. Soils developed on the Ipswich Coal Measures are also infertile and support a very different native flora, including Brisbane's only mallee species – *Eucalyptus curtisii*.

Approaching the Brisbane River, and along the lower reaches of streams, the local rock is covered by alluvia brought down from higher altitudes. Because of its texture, improved moisture availability (being at the lower end of the slope), and, frequently, at least moderate fertility, these areas are favoured for re-establishing rainforest communities.

Handy Resources

Beckmann, G., Hubble, G. and Thompson, C. (1987). The Soil Landscapes of Brisbane and South-east Environs. CSIRO, Australia. 77 pp.

Brisbane City Council (2007). Know Your Creek, Moggill Creek. 46pp. Available free or download from www.brisbane.qld.gov.au and search for 'Know Your Creek'.

Brisbane City Council (undated). Pullen Pullen Creek, Know Your Creek. 19pp. Available free or download from www.brisbane.qld.gov.au and search for 'Know Your Creek'.

Willmott, Warwick and Stevens, Neville (1992). Rocks and Landscapes of Brisbane and Ipswich. Geological Society of Australia, Queensland Division. 72 pp.

(For further BCC information, visit www.brisbane.qld.gov.au)

{CHAPTER 3}
Flora & Fauna

A region with rich Biodiversity

Brisbane is recognised as the most biologically diverse capital city in Australia. The major threats to the City's biodiversity are loss of habitat for native plants and animals, and the fragmentation and simplification of remaining habitat areas. Since European settlement, about 70 percent of Brisbane's original woody vegetation has been cleared.

Brisbane is also part of one of the fastest growing urban regions in Australia, which puts enormous pressure on its natural assets. The challenge for the Council and the community is to protect and restore the City's natural assets and associated services they provide, while accommodating urban growth.

The Moggill Creek and Pullen Pullen catchments contain more bushland than any other district in Brisbane, and management of bush on the individual properties plays a very important part in contributing to Brisbane's overall biodiversity.

Flora

Four main vegetation communities occur within the district: Open eucalypt forest, Rainforest, Riparian (water side) forest, and Forest red gum open forest and woodland.

The **open eucalypt forests** are very diverse and at most undisturbed sites, five to seven eucalypt species are present.

Mixed eucalypt open forests grow on steep hills and ridges, while tall woodlands of the same species are present on some north-facing slopes. The most common eucalypt species in the district are grey gum (*Eucalyptus propinqua*), spotted gum (*Corymbia citriodora)* and iron barks. Forest red gum (*Eucalyptus tereticornis*) also occurs, although it also represents a particular vegetation community (see below). Other species commonly found in the open forests include forest oak (*Allocasuarina torulosa*), red ash (*Alphitonia excelsa*), brush box (*Lophostemon confertus*) and kurrajong (*Brachychiton populneus*). In many areas the understorey would have been dominated by kangaroo grass (*Themeda triandra*).

Rainforest communities mainly occur in areas of the district with more fertile soils. This vegetation type contains a diverse range of species, with over 250 different species recorded. Rainforest communities are particularly important for supporting a wide range of butterfly species. Rainforest in the district is often characterised by emergent hoop pines (*Araucaria cunninghamii*) rising above the surrounding tree canopy. Other commonly encountered rainforest species include the trees, foam bark (*Jagera pseudorhus*) and red kamala (*Mallotus philippensis*); the shrubs, native holly (*Alchornea ilicifolia*) and chain fruit (*Alyxia ruscifolia*); and the understorey plant, love flower (*Pseuderanthemum variabile*).

Riparian rainforest used to occur along waterways in the district but has been degraded in most areas. A comparatively small number of species usually dominate riparian rainforests. Common riparian trees in the district include lillypilly (*Syzygium smithii*), weeping red bottlebrush (*Melaleuca viminalis,* previously *Callistemon viminalis*), river oak (*Casuariana cunninghamiana*) and sandpaper fig (*Ficus coronata*). The understorey plant mat rush (*Lomandra hystrix*) is often to be found stabilising creek banks).

Forest red gum open forest and woodland usually occurs on floodplains, such as in the low lying areas of Pullenvale. As the name suggests it is dominated by forest red gum (*Eucalyptus tereticornis*); a species which, in our district, also extends into the open eucalypt forest community. While this species is one of the more common eucalypts in the Brisbane area, very few intact stands of the forest red gum open forest community remain. Other tree species found in this vegetation community include: broad leaved apple (*Angophora subvelutina*) and carbeen (*Corymbia tessellaris*).

Visit www.moggillcreek.org.au for advice on growing native plants and a list of species recorded in the Moggill Creek catchment.

Areas of special significance

Smith's Rainforest Nature Refuge at Upper Brookfield is the single largest remnant of dry rainforest remaining in Brisbane, with about 6 ha of forest that has never been cleared and from which no timber has been taken for 50 years.

The relatively small bushland area of the former Eden Rainforest Sanctuary at Pullenvale has locally-rare plant species including the native jute (*Corchorus cunninghamii*). One of Brisbane's first Voluntary Conservation Agreements between the Council and a private landowner was signed on this site in 1997.

Bushland to the south of Primley Street has rainforest patches on the steep slopes

where the endangered hairy hazelwood (*Symplocos harroldii*) tree species exists.

The large-leafed spotted gum (*Corymbia henryi*) and Plunkett mallee (*Eucalyptus curtisii*) are also found here; the former is classed as 'significant' and and the latter as a 'rare and threatened' species within the greater Brisbane region. Other uncommon species in the area include the tree scrub ironbark (*Austromyrtus acmenoides*) and the shrub *Notelaea lloydii*, related to the native olive.

Fauna

Clearing of native vegetation since settlement by Europeans, first for agriculture and later for urban development, has reduced and fragmented the area of habitat available for native animals. Development also introduced non-native plants and animals to the area. Weeds competed with or replaced much of the native flora, reducing the food sources for some wildlife. Domestic and feral animals also competed with, or preyed upon, the native fauna. Other human impacts such as hunting and later, pollution and cars, took their toll on the populations of local wildlife.

Despite this, many native animals can still be found in the catchments today. Moggill Creek catchment includes the forested foothills of the D'Aguilar Range, which provides habitat for more species of mammals, birds and reptiles than any other area of mainland Brisbane. The rural nature of the upper and middle catchment, areas of remnant vegetation and the rehabilitation work being done by landholders and the community, supported by the Council, provide other opportunities for native fauna to live and move throughout the catchments.

Mammals

The variety of habitats in the district support a diversity of native mammal species and population numbers not found in most areas of the city. Four of Brisbane's five species of gliders have been recorded in the Moggill Creek area; the greater glider, squirrel glider, sugar glider and feathertail glider. The mix of farmland, rainforest, open forest and eucalypt woodland also provides shelter and food for four species of macropod: the eastern grey kangaroo, whiptail wallaby, red-necked wallaby and swamp wallaby. The last specimen of the spotted-tailed quoll in Brisbane was recorded from Brookfield in 1957, however signs of this marsupial carnivore have again been seen in the catchment in recent years.

Many other mammal species occur in the district, including the iconic platypus and koala, and the rarely-seen brush-tailed phascogale. Pullen Pullen and Moggill Creeks are two of only a few Brisbane streams still supporting viable populations of platypus. More than 40 koala sightings over the five year period to January 2009 have been recorded in the Moggill Creek catchment.

Birds

Around 250 species of birds have been recorded in the Moggill district. Some are considered rare, such as the grey goshawk, Lewin's rail and the square-tailed kite, while others are only occasional visitors, such as the black-necked stork. Some species are seen in the area seasonally, including winter visitors such as Pacific baza, and

summer visitors, the channel-billed cuckoo and common koel. Resident species include some not commonly found elsewhere in Brisbane, such as the satin bowerbird and regent bowerbird, and bell miner.

Reptiles and Amphibia

Many reptile species are to be found in the district. The comparatively harmless carpet python is commonly seen in the warmer months, as are slender and colourful green tree snakes. The venomous red-bellied black snake and eastern brown snake are fortunately less commonly encountered. There are quite a number of small to medium-sized species, some venomous and some quite harmless. Among the smaller venomous ones are the small-eyed snake, and the rough-scale snake which is very similar to the harmless fresh-water snake. Brown tree snakes are conspicuous and reasonably common and, though venomous, they are rear-fanged and unlikely to deliver a serious bite. It is always a wise precaution to leave any snake alone; they will very rarely bite, unless provoked.

Moggill Creek derives its name from the eastern water dragon, commonly seen along creeks in the district. The common bearded dragon may be seen if there aren't too many cats around and there are various other lizard and skink species, including the collared delma (*Delma torquata*) which is considered to be vulnerable.

Freshwater turtles enjoy the creeks, including the broad-shelled river turtle, eastern long-necked turtle, short-necked turtle and saw-shelled turtle.

Numerous species of frogs can be found in the creeks of the district including the tusked frog, green treefrog, graceful treefrog and the great barred frog.

Fish

The large rural and natural areas and limited urban development in the catchment has allowed many native fish species to survive. In fact, Moggill Creek has the highest diversity of native freshwater fish species in Brisbane, with 17 species being recorded at one site. However, exotic fish species such as mosquito fish, swordtails and guppies are also present in Pullen Pullen and Moggill Creeks. These introduced species now dominate the freshwater reaches of many of the city's creeks.

Butterflies

Numerous species of butterfly may be seen in the catchments, including the Australian painted lady, glasswing, lemon migrant, clearwing swallowtail and chequered swallowtail.

A listing of 133 butterfly species identified in the Moggill Creek catchment, together with the food plants of their caterpillars, is available on www.moggillcreek.org.au .

Handy resources:

Cameron, Ian. (1999). A Green and Pleasant Land. Published by the author. 107 pp.

Brisbane City Council (2007). Know Your Creek, Moggill Creek. 46pp. Available free or download from www.brisbane.qld.gov.au and search for 'Know Your Creek'.

Brisbane City Council (undated). Pullen Pullen Creek, Know Your Creek. 19pp. Available free or download from www.brisbane.qld.gov.au and search for 'Know Your Creek'.

Wager, Libby. (1998). Different tracks. Kenmore-Brookfield Parish of the Uniting Church of Australia. 138 pp.

(For further BCC information, visit www.brisbane.qld.gov.au)

{CHAPTER 4}
Managing your own Property

Your reasons for wanting to live in this part of Brisbane

There are many reasons why people might want to live in this part of Brisbane. Amongst these would be:

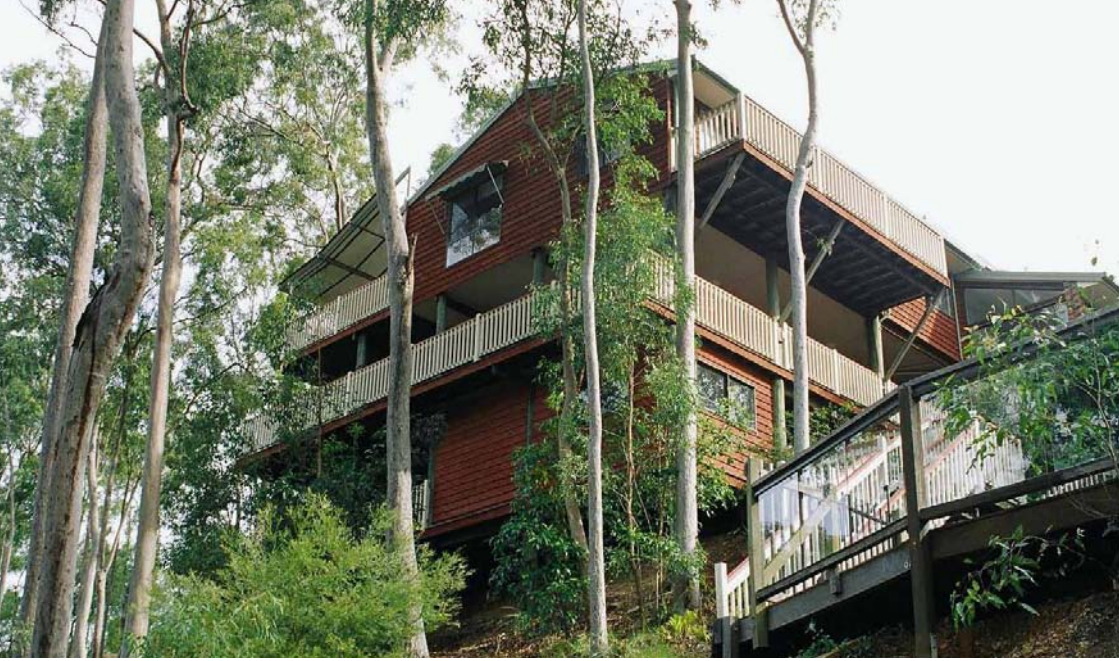
- peace and quiet
- to live in a natural environment, and enjoy birds and other wildlife,
- to have space for a big garden,
- to have space for the kids to run around,
- to be able to keep a few ponies or cows,
- close to the city centre but not built in

Many who come to live on acreage properties in this district come from very different areas and this booklet endeavours to give them some guidance in achieving their goals.

General considerations

Under the South East Queensland Regional Plan 2005 – 2026, most of our district is included in the Regional Landscape and Rural Production Area (RLRP) and is covered by strict controls on sub-division, limiting new sub-divisions to areas exceeding 100 hectares. Kenmore and the area around Bellbowrie are included in the Urban Footprint where such limitations do not apply.

The Brisbane City Council provides the regulations for administering the area,



A pole house in Brookfield (photo BH)

most of which is included in Brisbane's 'Green Space System', covering the RLRP area noted above. That land in private ownership is further classified as the 'Rural Area' or 'Environment Protection Area', the latter largely well-wooded or forested. Waterways are also defined.

The Rural and Environment Protection Areas have specific requirements for planning and building. For all basic building works and renovations, landowners have to comply with Council planning schemes, specifically the Council's house code requirements. This can be viewed on-line at www.brisbane.qld.gov.au or for more information or advice contact the Council on 3403 8888.

Land close to the Brisbane River is covered by the 'Brisbane River Corridor Planning Scheme Policy'. Precinct 1 stretches from Pinjarra Hills upstream for 54 km and Precinct 2 extends from Precinct 1 downstream to Toowong. Precinct 1 seeks to protect the important natural and rural landscapes along the river banks as well as the riparian vegetation.

What sort of a block do you own?

Acreage properties in our district generally range from 1-10 hectares and from fully cleared land previously under pasture to largely undisturbed bushland. Also, properties range from being generally flatter at lower altitudes to steeply sloping towards the west of the district. Soils range from relatively fertile alluvial or volcanic soils to shallow infertile soils on ridges, and sandstone-derived soils in southern parts of the district. Almost invariably there will be an exotic weed component and often this will be a major issue.

All of this has an influence on what you can reasonably expect to achieve on your property. Ideally, those wishing to

keep livestock or have a big garden would have purchased largely cleared land, and more natural areas would be in the hands of those particularly appreciative of native bushland. If you are keen to grow fruit and vegetables, you are likely to find it difficult except on fertile riparian or volcanic soils, and you will require a reliable source of water

Inevitably you will have a number of questions in mind and we have tried to answer some of these. For any queries that we do not address, your Creek Ranger should be able to help or to direct you to locals who have specialised knowledge.

What sort of house should I build, and where?

Brisbane City Council's Natural Assets Local Law 2003 helps to protect our natural assets, including bushland, areas, wetlands, waterway corridors and trees in urban areas. This law affects many properties in the district, especially near the river, or any waterway or drainage line, in bushland areas, or in an emerging community (future urban land) with large trees.

Visit a Council Customer Service Centre or contact the Council on 3403 8888 for more information on protected vegetation on your property and any legal requirements relating to protected vegetation. Usually there will be a designated Building Location Envelope on your property.

It is important to appreciate that *any* land disturbance is likely to result in the introduction of weeds. Many of the bushland areas in our district are quite steep, and the popular method of preparing a flat area (cut-and-fill) for a house exposes large areas of bare earth to weed invasion. Building a pole house minimises the area of disturbed soils and is an option that should be considered.

If at all possible, avoid building your house on a north west facing slope, particularly in bushland areas. North west facing slopes are particularly hazardous in bush fire conditions.

Avoid more clearing than necessary for your purpose. – cleared land will soon become weed-infested.

Avoid building close to eucalypts – they are inclined to shed branches. Sadly, sometimes trees need to be cut down, but it is preferable to change the siting of a future house to cutting down a tree that could well be over 200 years old. Many well-vegetated areas in our district are covered by Vegetation Protection Orders – enquire 3403 8888 for details.

Houses and other buildings should not be built in riparian (flood prone) areas, for obvious reasons – sooner or later they are likely to be flooded. The Council has established a 'Flood Regulation Line' either side of larger creeks, within which building is not allowed. It is the owner's responsibility to find out whether Flood Regulation Lines apply and also Vegetation Protection Orders.

It is a good idea to locate a house away from important habitat areas such as creeks, as the noise, movement, soil disturbance, and other effects associated with human occupation, can have a negative effect on wildlife. It is usually

a requirement of the Council that houses and other buildings are located more than 30 m from creeks and well-defined drainage lines. Information on the location of waterway corridors is available on the Council website. *PDOnline Interactive Mapping* can be found on the PDOnline homepage via the Building and Development link within the Brisbane City Council website (www.brisbane.qld.gov.au).

If you are lucky enough to own a property in relatively undisturbed bushland, make sure building contractors clean equipment before entering, so as to avoid introduction of weeds.

How do I prevent erosion down my driveway or across my paddocks?

Erosion is caused by fast-moving water and anything you can do to reduce the rate of runoff during storm events will reduce erosion. This can be achieved by using a sequence of barriers and spreading the depth of water. Typically on driveways low broad mounds are built into the road every 15 to 20 metres to pond/slow the runoff and have it run off to the side in a broad level channel, preferably into a well grassed area. The distance between mounds needs to be shorter for steeper land. In areas where it is difficult to maintain well grassed sites for runoff control; more expensive designed structures such as concrete or rock barriers and table drains may be needed. As a temporary measure straw-bales can be used.

Pastures should be maintained with a good ground-cover (at least 70%) – this usually means avoiding over-grazing. If pastures are badly degraded, destocking should be considered. Where gullies start to form, a prompt response is necessary, slowing down flow by means of rocks or planting of Monto vetiver grass (*Vetiveria zizanioides*), a sterile tussock grass developed for this purpose and widely tested in Queensland (DNRW).

When clearing sloping land preparatory to revegetation, consider leaving strips of uncleared land along the contour, to reduce run-off and soil loss, and clear them only when the first areas have established successfully. Trunks and major branches of any felled weed trees should be laid along the contours rather than up and down the slope.

My property is largely cleared; what should I consider when landscaping it?

As a general rule, we suggest that the aim for those building houses should be a design that is in harmony with the local countryside and vegetation. Similarly in the garden, avoid straight lines when building terraces and avoid using rocks that are not local and impinge on the scenic amenity of the area.

Where planting a garden, consider having your brighter-coloured exotic and hybrid plants close to the house and having a planted bushland further away. It is preferable to plant local natives – they are good for local wildlife and if appropriate for your site, need no additional irrigation after establishment.

If planting exotics, select those species that do not produce seed and become invasive. Good examples are roses, camellias, philodendrons, hibiscus, bougainvillea. Poincianas are an example that does produce seed but is not invasive in this district.

Mock Orange – becoming a significant environmental weed (Photo :BH)

To help protect our creeks from weed invasion, avoid using plants in your garden that are likely to become a pest – for example, ochna (*Ochna serrulata*) and mock orange (*Murraya paniculata*). Also, you should be aware that many commercial nurseries are – quite legally – promoting plants that are known to be invasive; e.g. *Duranta repens* "Sheena's Gold".

What aspects are important in riparian areas?

Landholders fortunate enough to have frontages to creeks (riparian land) will usually know how attractive, diverse and productive their land is compared to land away from the streams. It is usually the most diverse part of the landscape in terms of vegetation, plant and animal species, and is the land most valued for grazing or agricultural production. In recent years Land and Water Australia (2003) has led national efforts to assess the values of riparian lands, identify the threats to their condition and the development of practical management guidelines for landholders.

Some specific functions of riparian zones include:

- Reserves of a wide range of unique vegetation communities
- Provision of food, refuge and corridors for movement of wildlife
- Provision of food and habitat for in-stream life
- Buffering of streams from sediments, nutrients and other contaminants in surface runoff and groundwater
- Protection of stream bank stability
- Moderating temperatures and wind effects on native animals

Overclearing of these lands for cropping or grazing, coupled with limited stock control often leads to damaged vegetation along creek flats and creek banks and can lead to serious erosion, and degradation of water quality. In addition there is loss of vegetation, animal and aquatic species which may lead to local extinction of some species or ecosystems.

A major objective of landholders should be to limit loss of habitat and degradation of stream water quality. Special care needs to be taken when using fertilisers, herbicides and pesticides close to riparian areas to avoid contamination or pollution of the water, or damage to native vegetation.

Similarly threats to stream water quality from waste water disposal (grey water and septic tank overflows) and intensive stock facilities should be

Long-leaved matrush stabilising Upper Brookfield creek bank (Photo: BH)

assessed when planning the location of houses and other buildings.

There has been a focus in the Moggill Creek – Pullen Pullen area on programs of bush regeneration of riparian zones and attempts to re-establish corridors with neighbouring higher lands. Key issues common to these efforts include selection and planting of appropriate local vegetation species, protection and promotion of natural regeneration, weed control, and minimising erosion on stream banks from grazing horses and cattle and periodic floods.

How do I stabilise my creek banks and gullies?

If you have a creek on your property, stabilising the banks should be one of your primary objectives. The method you use will depend on the size of the creek, the likelihood of serious flooding and existing vegetation cover.

There is a lot to be said for weed removal and planting in sections, perhaps working on 10-15 m lengths of creek and leaving 5 m to be done a couple of years later. This could reduce damage in the event of a flood.

Some species in our district are well adapted to creekside situations and should be considered when planning the work. Pre-eminent are the two matrushes *Lomandra hystrix* and *L. longifolia*. Also common along creeks are red bottlebrush (*Melaleuca viminalis*), creek sandpaper fig (*Ficus coronata*), river oak (*Casuarina cunninghamiana*), black tea tree (*Melaleuca bracteata*), and lilly pilly (*Syzygium smithii*).

For smaller areas, it is a good idea to purchase biodegradable weed matting such as jute`mat or some similar product as an aid to erosion prevention. Jute mat may be 'nailed' down, with overlaps pointing downstream, and crosses cut into it to enable plants to be planted. The jute mat saves the plants from washing away in a flood for some months, but biodegrades in about a year.

What should I do with garden rubbish?

Discarded garden clippings and other litter can spread weeds and change the nutrient levels of the soil. Biodegradable garden organic material – providing it does not include viable seeds, fruit or stems that can sprout – can be used as a coarse mulch or composted. It is particularly important not to discard garden rubbish into bushland and riparian areas. To report any garden waste dumping, phone Council on 3403 8888.

Although prunings of many species can be used as coarse mulch or composted, many species can sprout and grow quite readily away from soil contact. Examples are purple succulent (*Callisia fragrans*), mother of millions (*Bryophyllum* spp.) and Madeira vine (*Anredera cordifolia*). Care should be taken with disposal of

these – see 'Removal of Madeira vine', page 29. Limited quantities, providing they are bagged, can be disposed of in Council rubbish bins providing these do not weigh more than 70 kg.

Within a forested area, branches sometimes fall and leaf 'litter' accumulates on the ground. This should be left in place as it provides habitat for a variety of insects, lizards and other wild life. It should **not** be burned. When clearing lantana and other weeds, leave the cut stems scattered (not piled up), unless there are seeds or stems that might develop into plants – these should be bagged for disposal.

Household refuse can also attract pest animals or cause injury to native wildlife. Where biodegradable, refuse should be placed well away from habitat areas where it can be recycled or composted. Non-biodegradable refuse should be properly disposed of – contact BCC Call Centre (3403 8888) for details.

How do I set about restoring natural bushland to my property?

Why should we conserve or regenerate native bushland?

Since European settlement in Australia, more than 70% of all native vegetation has been removed or significantly modified, followed by impacts on water and land resources. In Queensland today, the destruction of bushland continues at an unprecedented rate, with hundreds of thousands of hectares of native vegetation being cleared each year. In our own district, little remains of the rainforest that once covered the valleys and the eucalypt woodland is also under increasing pressure. Bush regeneration aims to restore and maintain ecosystems that were naturally present before colonisation.

For a list of species native to the area and suitable for different habitats, see Hacker *et al*. 1994 – "Putting Back the Forest".

Broadly speaking, our district was covered with eucalypt woodland or forest on the poorer and drier soils and rainforest on the more fertile and moister soils. If your property is on the former class of country, most rainforest species are unlikely to be well-adapted. In the Moggill Creek catchment we have found

"..... TURN FIRST LEFT AT THE CAMPHOR LAUREL...STOP AT THE CHINESE ELM...MAKE A U-TURN AS SOON AS PRACTICABLE...."

Madeira vine is a threat to native shrubs and trees, cutting off light and causing their death (Photo: BH)

that a number of particularly tough rainforest species can be grown almost anywhere, and if you are seeking a more lush appearance than offered by eucalypts, these species could be considered. Examples are tulipwood (*Harpullia pendula*), foam bark (*Jagera pseudorhus*) and ribbonwood (*Euroschinus falcatus*), but there are a number of others too.

What methods are available for restoring bushland?

The first step is likely to be clearing lots of weeds, particularly lantana in this area, and weed control is discussed in more detail in a later section. However, clearing lantana and other weeds is only the first step because that opens the way for a lot of other weeds which will need to be controlled. It is also important to establish or encourage the development of native ground cover. The challenge is to control the weeds but also maintain a healthy understorey and ground cover which can support the insects and other arthropods on which the small lizards, frogs and so many of the birds depend. Native grasses make a good ground cover and, most importantly, a good grass cover does a good job inhibiting weeds.

If you are lucky enough to own a largely undisturbed area, natural regeneration is the way to go. In this case, seedlings develop from seed from local trees and understorey plants. Mostly, though, there will be a range of invasive weeds present that are likely to out-compete native seedlings. In our district, therefore, it is critically important that the weeds are kept under control, if natural regeneration is to be successful.

Natural regeneration relies on seed that is present in the soil, or, depending on the species, is introduced by birds, wind or sometimes water. Not many species have seeds that remain viable for more than a few years in the soil, a notable exception being the genus *Acacia*. Where there are trees present, perching birds bring in seed of those species that develop fruit that attract fruit-eating birds. The nearer the trees of such species occur, the greater the opportunity for seed to be introduced naturally. With species that have seed (e.g. bottle brushes (*Melaleuca* spp.)) or fruit (e.g. white booyong (*Argyrodendron trifoliolatum*)) that is carried by wind, the distance the

seed is carried is generally quite short. In consequence, it is unlikely that a wide range of species will develop from natural regeneration unless the site is in close proximity to species-rich vegetation. Thus, often planting on a substantial scale is required in revegetation activities but opportunities for natural regeneration should be promoted.

The most common situation in our district is a landscape that was previously under pasture or cropping (bananas, pawpaw, pineapples) and is treeless or with a sparse tree cover. In this case, there will be a need for total or near-total replanting. Several issues need to be remembered or considered:

- don't bite off more than you can chew (how much time do you have available?) – a small area revegetated successfully is better than a larger area that doesn't survive;
- what species should you plant? – ideally plant species that used to occur naturally in the area and on that soil type; seek advice from local experts;
- plant a mixture of pioneer and climax trees (that is, those species that might be expected to occur in old-growth forests), shrubs and herbs;
- plant eucalypts, brush box (*Lophostemon confertus*) and tougher rainforest trees on thinner soils; a wide range of tree species are well-suited to deeper and more fertile soils;
- do you have access to the plants you want (be flexible)? – free plants are available to MCCG and PPCG members at the MCCG nursery and Greening Australia Nursery at The Gap sells plants at low cost; check on the MCCG website and Hacker *et al.* 1994 whether the species you are after are local, especially if purchasing from a commercial nursery;
- have you access to enough water to establish your revegetation area?
- what time of the year do you intend to plant? Our climate here is notoriously variable and any time could be 'good' or 'bad'. In general, autumn is considered best, when there should be some moisture in the soil and the summer heat is past. Where possible, take the 'opportunities' as they arise – these could be a spell of wet weather – or a long weekend!
- seek advice on use of water crystals and fertilizer. Many revegetators swear by them. There are valid arguments for and against;
- if planting in a frost-prone area where tree tobacco (*Solanum mauritianum*) plants are present, do not remove immediately as they are an aid to frost protection. These can also be left to provide shade for young seedlings and removed as the natives become better established. Any tree cover provides protection from frost but competition from too many other plants slows the development of planted seedlings.

Many native plant nurseries provide plants in 'tubes' 5 x 5 cm and 12 cm deep. Under fair to good conditions, such plants establish well, but some prefer to 'pot seedlings on' to larger pots before planting

out. It's largely a matter of personal preference and convenience; in either case, avoid keeping a plant too long in its pot, when the root system will be too restricted to provide water and nutrients to the large upper portion of the plant.

There are several 'must do's' and recommendations:

- there are three 'musts' and they are 'mulch, mulch, mulch'. Mulch can be forest mulch, sugarcane mulch or weed-free mulch from your garden. Best success is with broad-scale mulching to a depth of 10 cm, but this is generally impractical. Where native seedlings are present or likely to be present, only mulch around your planted plants. Purchase (and spread if broad-scale mulching) your mulch before obtaining your plants;
- dig a hole for your plant ideally 1.5 times the depth of the pot and loosen and break up the soil in a circle c. 50 cm diameter, breaking up any clods. Do not excise any large roots penetrating the area as this will only encourage them to proliferate. Apply water crystals and/or fertilizer if desired, plant seedling and allow for a shallow depression around base of plant to enhance effectiveness of watering. This is particularly important on sloping ground;
- water thoroughly and deeply soon after planting (on a hot day, within minutes). Each plant should receive at least 4 litres. Depending on the weather and situation, plants should be watered at 1-2 week intervals for several weeks, followed by monthly until established – usually c. 12 months. (In riparian areas a single watering can be sufficient but this is rarely the case on upper slopes.)
- insert a stake to mark the position of the plant (this is important when it comes to weed control time several weeks later and there is uncertainty as to what is a weed). Alternatively a plastic 'grow bag' can be used – these have the added advantage that they provide some protection from grazing hares;
- on more fertile soils, plants should be about 1.5 m apart. All being well, this should ensure canopy closure and thus reduced weed competition within three years; on less fertile soils and when planting eucalypts, plants may be further apart – up to several metres.

What about power lines?

Trees and shrubs planted near power lines can pose a serious safety risk and when mature should be less than 2 m from the power line. For local native plants, consider visiting the MCCG nursery, where you can obtain reliable advice.

For an extensive list of suitable trees species to plant under power lines visit: http://www.energex.com.au/safety/asp/safetree_guide.asp. Before planting on ENERGEX easements always contact ENERGEX on 13 12 53 to check if there are any special planting requirements.

What do I do about scrub turkeys?

Planting anything when scrub turkeys are active is a problem. The males, who build the nests, are generally most active over the summer breeding season. For this and other reasons, it is best to plant in autumn, although males and females feed throughout the year and are particularly attracted to moist areas – just where

you have watered your seedlings!. Some protection can be offered planted plants by surrounding with three or four large rocks and/or providing barriers of logs.

Re-locating male scrub turkeys is tempting, but they are very territorial and we have been told that translocated male birds are unlikely to survive.

What is present already?

Learn to identify native and weed species and ask your Creek Ranger or local experts if you need to. Most sites of more than a few hectares would naturally have included 50 or more native species of flowering plants. Species in the immediate area are likely to be adapted to the local soil type, aspect and moisture conditions. Look out for seedlings of these species and make sure you protect them. Putting a stake close by is a good way to save them from the mower!

A fairly comprehensive list of species in the Moggill Creek catchment – local natives and weeds – is available on www.moggillcreek.org.au. Many of these species will be present in the Pullen-Pullen – Moggill area, but others will occur, too. Although you might mainly be interested in the trees and shrubs, it is a good idea to consider the herbaceous flora (grasses etc.) too.

The different soil characteristics associated with the sandstones of the 'Ipswich Coal Measures', south of about Bellbowrie, have given rise to a very different flora, and those living in this area are encouraged to learn more about it and protect what little remains. Some important species in this area include *Eucalyptus curtisii* (Plunkett mallee) and *E. seeana* (narrow leaved red gum).

I am looking for quick-growing species to provide a screen from my neighbour – what do you suggest?

A mixture of species is a good way to go, selecting those with dense canopies to a low level. There are many to choose from, but suggestions are a mixture of tulip wood (*Harpullia pendula*), Brisbane wattle (*Acacia fimbriata*) and red kamala (*Mallotus philippensis*). If taller trees are required, brush box (*Lophostemon confertus*) could be included. The mixture could depend on the particular situation.

What should I do about edge effects?

Edges can provide opportunities for weeds to invade natural vegetation and your regenerated areas. Disturbance and increased light creates opportunities for weeds to establish. Ideally therefore, you should aim to have the minimum length of edge possible and this is achieved by having a circular revegetation area. Frequently, though, revegetation is along a creek, when edges are extended along the length of the creek

To overcome the adverse effect of edges, it is suggested shrubs with a low canopy are beneficial, as they reduce light penetration into the revegetation area. A good example in our area is Brisbane wattle (*Acacia fimbriata*). This species also is quick growing and regenerates within a couple of years of planting.

Where tractor-mowing along the margin of a revegetated area is anticipated, it is a good idea to plant a row of long-

Molasses grass, a fire hazard in bushland (Photo: CH)

leaved matrush (*Lomandra longifolia*) at about 80 cm intervals. This species can withstand the occasional mow without too much ill-effect.

How can I enhance wildlife corridors?

Wildlife corridors generally mean a continuity of native vegetation between larger areas. Several landholders, each contributing a small amount of habitat, can effectively create a wildlife corridor. Corridors often run along creeks, where vegetation tends to be thickest, but ridgetops and woodland area can also provide corridor conditions. Corridor requirements differ for different animal species, but native trees with a complex native shrub (and grass in eucalypt woodlands) understorey are likely to provide optimal conditions.

Will I need to burn my area of bushland?

If your property is forested or adjoins a forested area, there are implications for fire management. Your first priority must be the personal safety of yourself and your family. Make sure you have batteries for your radio and maintain contact with local radio stations if a disaster threatens. It is not the intent of this booklet to give definitive advice on protection against bushfires, but a few guidelines are appropriate.

Brisbane's climate is very different from that of southern states and we are extremely unlikely to suffer the wildfires that have caused so much loss of life and property, particularly as happened in Victoria in February 2009. Summers here are much more humid and long-term residents of our district have rarely seen the tree-top fires and ember attacks of that 2009 Victorian summer.

In the vicinity of houses and other buildings, it is really important to keep the understorey clear of flammable material. Wattles are reputed to burn readily and again should not be planted near houses in exposed areas. Any trees planted around buildings and roads should be non-flammable, to improve opportunities to drive out safely in the event of a bushfire. In our district environmental weeds such as lantana and molasses grass (*Melinis minutiflora*) frequently make up much of the bulk of the understorey and keeping these under control will do much to protect your property from damaging fires.

If you are reliant on tank water, avoid using plastic water tanks and fittings, and where plastic water tanks are installed, make sure they are not at risk in a bush fire. Also make sure you have back-up power for pumping.

As a general rule, burning should be avoided and no burning should be carried out without a permit. A Queensland Fire and Rescue Service (QFRS) Permit to Burn is required to burn any vegetation covering an area of 2 m^2 or more (obtainable from the Kenmore Fire Station – 3878 1052). A Notice of Compliance from BCC is also

Para grass is a serious wetland weed (Photo: BH)

needed so that QFRS know that you are not breaking any Council laws.

Rainforest areas should never be burnt; too frequent burning of eucalypt woodland restricts biodiversity. Where burning is practised, it should be 'mosaic burning' and not carried out in winter when many invertebrates are inactive (diapause).

For further information on approved measures you can implement to mitigate fire risk, see "Individual Property Fire Management Planning Kit", available from the SEQ Fire and Biodiversity Consortium (5552 8259), or contact Brisbane City Council 3403 8888.

There is a small dam on my property. How do I improve its habitat value for frogs?

Dams are potentially good breeding areas for native frogs but also attract the exotic cane toad, a serious pest. Exotic grasses like para grass (*Urochloa mutica*), with long, trailing stems, frequently invade moist areas and are best controlled by hand or judicious use of herbicides.

Close planting of dense tussock plants such as *Lomandra hystrix* (and probably the sedges *Carex appressa* and *C. declinata*) provides a barrier to cane toads and favours native frogs.

A grass that is well suited to sunny waterside situations is swamp rice grass (*Leersia hexandra*). Local experience suggests that it has the capacity to reduce evaporation from the water surface.

Am I allowed to pump water from the creek or sink a bore?

Owners of properties bordering creeks are entitled to pump water from the creek providing they have a licence, but there are conditions to these activities and they must comply with a self-assessable code and be registered with the Queensland Department of Environment and Resource Management (http://www.derm.qld.gov.au/). For a copy of the code and a registration form go to:http://www.nrw.qld.gov.au/water/management/dev_assessment.html#self_assess

During drought conditions creeks can be irreversibly damaged through extraction of too much water, so pumping should be avoided when creeks are low or cease to flow.

There are a number of aquifers in the district and there are opportunities for extracting water without adversely affecting creek systems. Drilling for water may only be carried out by a licensed operator. For further details, contact the Queensland Department of Environment and Resource Management.

I would like to plant trees with flowers

Most trees have flowers, although for many they are small and insignificant. Amongst the more showy native trees are lace bark (*Brachychiton discolor*) and fire

Lacebark is a handsome local native (Photo: BH)

wheel (*Stenocarpus sinuatus*) and shrubs, native rosella (*Hibiscus heterophyllus*) and pointed-leaved hovea (*Hovea acutifolia*). There are many more and MCCG is currently (2009) developing a display garden at The Cottage, its Catchment Centre at the end of Gold Creek Road.

How do I know whether I have been successful?

What works at one site may not work at another. Opportunities to test different treatments and measure their "success" can be accommodated within a monitoring and evaluation framework.

It is important to keep lists of what you have planted and assess how well those species have grown. Remember, though, that some species naturally grow much more quickly than others. Taking before and after photographs can help you assess how much you have achieved and is also a good way of staying motivated.

But don't depend entirely on paperwork. Close attention to what is happening works wonders! Perhaps one of the most telling indications of success is when you find progeny from some of your planted trees coming up on their own.

Handy Resources

Brisbane City Council (2000). Brisbane City Plan.

Brisbane City Council (Nov 2003). A Guide to the Natural Assets Local Law: Protecting our Valuable Natural Assets. 32 pp.

Bureau of Meteorology www.bom.gov.au/weather/qld/

Land and Water Australia (2003). Managing Riparian Land to Achieve Multiple Objectives. RIPRAP Newsletter Edition 23, 2003. Land and Water Australia, Canberra."

Office of Urban Management (2005). South East Queensland Regional Plan 2005 – 2026. 237 pp.

Queensland Fire and Rescue Service www.fire.qld.gov.au

River Landscapes Website (Land and Water Australia) – www.rivers.gov.au

SEQ Fire and Biodiversity Consortium. Individual Property Fire Management Planning Kit, www.fireandbiodiversity.org.au

There are a few good books available if you would like to learn more about growing bush tucker:

Cribb, A.B. and Cribb, J.W. (1975). Wild Food in Australia. Fontana, Sydney. 240 pp.

Hiddins, Les. (2003). Bush Tucker Field Guide. Explore Australia Publishing/ABC Books. 184 pp.

Isaacs, Jennifer (1996). A Companion Guide to: Bush Food. Lansdowne Publishing. 158 pp.

Low, Tim. (1989). Bush Tucker (Australia's Wild Food Harvest). Angus and Robertson. 233 pp.

Smith, Keith and Smith, Irene. (2004). Grow Your Own Bush Foods. New Holland Publishers. 144 pp.

{CHAPTER 5}
Weeds and Pest Animals

What is a weed?

There are numerous definitions of the word 'weed', but basically, a weed is a plant in the wrong place. A weed can be an exotic species or a native species that colonises and persists in an ecosystem in which it did not previously exist. Local native weeds are umbrella tree (*Brassaia actinophylla*) and cadaghi (*Corymbia torelliana*), both from North Queensland.

Some weeds are of particular concern and, as a result, have been listed for priority management or in legislation. Some plants that threaten agriculture are declared as noxious by the Queensland Government, other weeds that threaten the natural environment are known as environmental weeds.

Throughout Australia, weeds are spreading faster than they can be controlled and management of them is consuming an enormous amount of

"AGNES! QUICK!! – THE KEY TO THE ROUND-UP LOCKER!"

Giant rat's tail grass in a Brookfield pasture (Photo: BH)

Zebrina, a groundcover that got away (Photo: BH)

resources. The weed problem is so severe that unless we can make progress in getting on top of it, we aren't going to achieve our objectives and everyone should contribute to the fight. Climate change poses an additional challenge to our ability to manage weeds.

Declared noxious weeds

There are three classes of declared plants under the *Land Protection (Pest and Stock Route Management) Act 2002*. These plants are targeted for control because they have, or could have, serious economic, environmental or social impacts.

There are legal obligations associated with the control, supply, sale, keeping and transport of declared plants in Queensland. Declaration under State Legislation imposes various legal responsibilities for control by landowners on land under their management, including all landowning state agencies.

It is illegal to supply a declared plant anywhere in Queensland without a permit issued by the Department of Environment and Resource Management.

Noxious weeds categories

Class 1 Weeds

Weeds that have the potential to become a very serious pest in Queensland in the future. We need to prevent the import, possession and sale of these species so that they can't escape to become pests. All landholders are required by law to keep their land free of Class 1 pests. It is a serious offence to introduce, keep or sell Class 1 pests without a permit.

Class 2 Weeds

Weeds that have already spread over substantial areas of Queensland, but their impact is so serious that we need to try and control them and avoid further spread onto properties that are still free of the pest. By law, all landholders must try to keep their land free of Class 2 pests and it is an offence to keep or sell these pests without a permit. Examples in our district are giant rat's tail grass (*Sporobolus pyramidalis* and *S. natalensis*) and mother of millions (*Bryophyllum* spp.).

Class 3 Weeds

Weeds that are commonly established in parts of Queensland but their control by landowners is not deemed to be warranted unless the plant is impacting, or has the potential to adversely affect, a nearby "environmentally significant area" (e.g. a National Park). It is an offence to sell, introduce or release a Class 3 pest. Examples in our district are climbing asparagus (*Asparagus africanus*) and Madeira vine (*Anredera cordifolia*).

There are many useful websites which provide a guide to local weed species, including the MCCG website at www.moggillcreek.org where you can find

A large Madeira vine tuber (Photo: BH)

a list of weed species declared by the State and City Council

How do I recognise what is a weed and what is a native?

In the present context, we are largely concerned with environmental weeds – that is, plants, not native to our area, that invade and replace locally native plants. About 70% of Australia's environmental weeds were purposefully introduced as ornamental or potential pasture plants.

Environmental weeds are plants that invade bushland and waterways. They degrade the aesthetic, recreational and ecological values of our catchments. Some weed trees and vines out-compete or smother native vegetation, resulting in communities restricted to very few species and of limited value to native wildlife. Some species produce toxic leaves (e.g. camphor laurel, *Cinnamomum camphora*) that poison native wildlife. Also, weed trees don't form hollows for nesting like our native eucalypts do.

Weeds typically produce large numbers of seeds, assisting their spread. They are often excellent at surviving and reproducing in disturbed environments and are commonly the first species to colonise and dominate in these conditions. Some weeds reproduce vegetatively and any part of stem or even leaf can give rise to a new plant. Local examples are mother of millions and Madeira vine.

Weeds undermine the diversity, ecology and beauty of our remaining bushland remnants and controlling weeds is crucial to successful bushland regeneration. Although there are numerous species that have become weeds, recognising the more serious weeds in our district is not too difficult.

As a general rule, a species which occurs to the extent of dominating an area and suppressing other plants is *likely* to be a weed. In the grasses, *usually* those with large, broad leaf blades are weeds.

If you are not sure if a plant on your property is a weed or not, don't remove it until you have identified it. Cut a stem of the plant, preferably with flowers or fruit. You can use the online Weed Identification Tool developed by BCC: www.brisbane.qld.gov.au/environment

If this doesn't help, take it to the Queensland Herbarium, located in the Mt Coot-tha Botanic Gardens to have it identified.

What priorities should I have for weed control?

Probably the worst weeds of all are the ones that climb over trees and provide such a dense mat that they choke off the light and cause the death of the tree. In our district, glycine (*Neonotonia wightii*) and Madeira vine (*Anredera cordifolia*) are probably the worst. Glycine can be controlled fairly easily; simply cut the characteristic whitish stem and poison or pull out the stump, but eradicating it may

The beautiful cat's claw is a major environmental weed (Photo: JG)

SERIOUS WEEDS COMMON IN THE PULLEN PULLEN CATCHMENT & MOGGILL CREEK CATCHMENT AREAS
TREES:
Chinese elm (*Celtis sinensis*)
Privet (*Ligustrum lucidum*)
Broad-leaved pepper (*Schinus terebinthifolius*)
SHRUBS:
Lantana (*Lantana camara*)
Ochna (*Ochna serrulata*)
VINES:
Madeira vine (*Anredera cordifolia*)
Climbing asparagus (*Asparagus africanus*)
Cat's claw (*Macfadyena unguis-cati*)
Glycine (*Neonotonia wightii*)
Dutchman's pipe (*Aristolochia elegans*)
Balloon vine (*Cardiospermum grandiflorum*).
Understorey plants and grasses:
Mother of millions (*Bryophyllum* spp.)
Purple succulent (*Callisia fragrans*)
Rhodes grass (*Chloris gayana*)
Creeping lantana (*Lantana montevidensis*)
Molasses grass (*Melinis minutiflora*)
Green panic (*Megathyrsus maximus* syn. *Panicum maximum*)
Singapore daisy (*Sphagneticola trilobata*)
signal grass (*Urochloa decumbens*)
broad-leaf paspalum (*Paspalum mandiocanum*)

be almost impossible, as seeds remain viable in the soil for many years. Madeira vine is much more difficult to control (see below).

Next of concern, probably, are Dutchman's pipe (*Aristolochia elegans*), balloon vine (*Cardiospermum grandiflorum*) and climbing asparagus (*Asparagus africanus*). One of the main concerns about Dutchman's pipe is that is is closely related to the native vine that Richmond Birdwing Butterflies need to lay their eggs on and they get confused between it and the much more common introduced weedy species. Unfortunately their caterpillars do not develop on the weedy one.

Lantana is usually easy to remove and the main benefit from doing so is probably to give easy access. Unfortunately, once the lantana is removed it makes way for a wide variety of worse weeds such as coralberry (*Rivina humilis*) and freckleface (*Hypoestes phyllostachya*), so removal of lantana is not necessarily the first priority, and be prepared for follow up work.

What is the best way to control weeds?

Some form of hand weeding is undoubtedly best – as it allows one to be highly selective in removing or poisoning weeds while protecting native plants nearby. The following few paragraphs provide some methods.

By hand

Shallow rooted plants, such as cobbler's pegs and many 'soft' weeds, and seedlings of many trees, can be manually removed. It is important to shake the soil from the roots – otherwise dropped weeds are likely to continue growing. For most

Chemical killing of trees using the cut stump method (Photo: BH)

species, unless ripe fruit or seeds are present, plants can be broken up and left on the ground to rot down.

When digging out plants with bulbs, corms or tubers all of the underground parts of the plant must be completely removed. e.g. Madeira vine, onion weed, oxalis. This can often be made difficult if the tubers are connected by thin roots which are easily severed.

Crowning Cut

For shrubs and vines with growing points below the soil surface, such as climbing asparagus, or ground asparagus (*Protasparagus aethiopicus*), insert a knife close to the base of the plant with the tip under the root system. Cut around the base of the plant severing all roots, and remove the plant.

Cut Stump method

Cut the trunk or stem close to ground level with a horizontal flat cut. Apply herbicide (e.g. Glyphosate) within 15 seconds of cutting using a paintbrush, eye dropper or small spray bottle, making sure to cover area close to rim of cut. Glyphosate should be 360 g/L, diluted 50%

Climbers and Scramblers

When removing climbers and scramblers (with the exception of Madeira vine) cut the climbing stems. The above ground and upper parts of the climber will die and should be left hanging. Manually remove any trailing stems and their associated roots. Cut the main stem close to ground level and treat with herbicide (i.e similar to Cut Stump method).

Removal of Madeira vine

This is a fleshy subtropical vine which reproduces from aerial tubers and is a major problem for existing remnant patches of vegetation in much of our area.

For small plants without aerial tubers remove the plant by hand. If the plant is mature and has aerial tubers the following methods can be used.

Scrape the stem lightly for several centimetres but do not cut through and apply 50% glyphosate immediately. The aerial tubers should slowly die over a period of weeks or months. Do not remove the plant but leave to die off. Alternatively, large stems when cut can be placed immediately in a container containing Starane or 50% glyphosate; this container should be tied to the aerial stem to allow it to 'drink its fill'. If using this approach, the basal parts of the plant should also be poisoned or removed.

Composting

Another method involves composting the soft-stemmed plants under a double layer of thick black plastic. Check that holes do not develop in the plastic or that plants

Treating aerial stems of Madeira vine (Photo: BH)

do not re-shoot from under the plastic. This method is particularly effective with zebrina (*Zebrina pendula*) and purple succulent (*Callisia fragrans*)

For most weeds, the best time to undertake control is before flowering and seeding.

Chemicals other than glyphosate

Some chemicals have been released that are quite selective, for example killing broad leaved plants but not grasses. Seek advice on specificity and use all chemicals with caution. Take notice of wind direction to prevent drift and be aware that chemicals could runoff or leach through the soil into the habitat and cause extensive damage. Also, some chemicals have a residual effect, persisting in the soil. Never spray in creeks.

Brushcutting or mowing

Some local residents find that brushcutting (at least a couple of times a year), ideally before the weeds set seed, is a good way to manage the annual weeds and it also leads to the establishment of native grasses. There is a need to keep a good lookout for any tiny self-sown seedling trees, shrubs and native understorey plants; given the chance they'll become a significant part of the mature patch. Brushcutting or hand pulling can be supplemented with the careful, spot use of a selective herbicide such as Kamba M or Amicide which does not kill the grass (but read carefully and adhere to the safety precautions outlined on the pack and, as well, refer to the Materials Safety Data Sheet, MSDS, via the Web). However, brushcutting or mowing should *never* be carried out when the weed mother of millions (*Bryophyllum* spp.) is present, as these practices only spread the weed. The herbicide AF300 is effective against mother of millions and also cobbler's pegs (but is also likely to kill broad-leaved native plants too). Brushcutting or mowing are also likely to encourage the development of cobbler's pegs (which take just a few weeks from germination to setting a seed crop) and stoloniferous weed grasses such as carpet grass (*Axonopus* spp.).

Overall spraying

In some situations where weed infestations are really serious, overall spraying with a non-specific herbicide such as roundup is sometimes the best alternative. Although this is the easiest way to knock out weedy grasses and shrubs, it also kills everything else, including self-sown native seedlings and, even worse, it destroys the habitat that supports most of the insects. Birds, lizards and frogs rely on those insects for food so, although it may look 'tidy', blanket spraying under trees can have a very negative effect on biodiversity and should be avoided if possible. Besides, it often simply leads to replacement by cobbler's pegs.

Before taking this course, be sure that no natives are present, and if there are, tie coloured tapes around their stems so they can be identified when spraying. Selective herbicides can be used or glyphosate, depending on the target species. It should be remembered that overall spraying of

Mother of Millions propagates from tiny leaf bulbils (Photo: BH)

a badly-infested area will result in large areas of bare ground and care needs to be taken (mulch, planting) to avoid re-infestation, potentially with an even worse weed than the one you have controlled.

So how does one manage the weeds under the trees? Hand pulling selectively is the best, of course, but not practicable in a larger area. Depending on the weed species present, repeated brushcutting is much more likely to yield good results, often encouraging the growth of native grasses which inhibit the growth of weeds while maintaining a productive understorey.

Biological control

Biological control agents have been selected and released for the control of a number of local weed species, including lantana (*Lantana camara*), salvinia (*Salvinia molesta*) and cat's claw (*Macfadyena unguis-cati*). These are all having some effect but are not expected to eliminate the weed species. Local Catchment Groups are raising the tinged insect which feeds on cat's claw and, depending on availability, will provide infested potted plants to local residents on request.

How do I control pest animals?

The main pest animals that can cause damage to revegetation areas are hares and deer. Placing tree guards around new plants can discourage hares. Deer are difficult to control other than by suitable fencing. Report all deer sightings promptly to the Council (3403 8888), as a means of encouraging more active control.

Smaller forms of wildlife may cause a considerable amount of damage to new plantings for example, the larvae of the Large Grass Yellow Butterfly can inflict serious damage to young plants of coffee bush (*Breynia oblongifolia*). Don't spray with insecticides – mostly plants recover – and we should remember that a good reason for planting local natives is to support local wildlife.

Handy Resources

Brisbane City Council (2007). Green Choice Gardening in Brisbane. Third Edition. 53 pp.

Brisbane City Council website has 7 videos on various techniques of weed removal.

Hacker, Bryan, Butler, Rona, and Rekdahl, Rae (1994). Putting Back the Forest – A Landcare guide for Brookfield, Pullenvale and Moggill. Rural Environment Planning Association. 150 pp. (available through Moggill Creek Catchment Group).

Leiper, Glenn, Glazebrook, Jan, Cox, Denis and Rathie, Kerry. (2008). Mangroves to Mountains – A field guide to plants of South-east Queensland. Logan River Branch, SGAP. 544 pp.

Ryan, Michelle (ed.) (2005). Wild Plants of Greater Brisbane. 2nd Printing. Queensland Museum. 372 pp.

{CHAPTER 6} Managing Wildlife and Domestic Stock

How do I attract native wildlife onto my property?

Conservation of wildlife and wildlife habitat, the environment in which a species can occur, survive and reproduce, is vitally important from an ecological perspective, and benefits landowners through enhancing the attractiveness and value of their land.

There are numerous benefits of wildlife conservation on private property. Perhaps foremost is that having native wildlife around contributes to the lifestyle of the owner and the pleasure of living in semi-rural areas. This may be achieved through maintenance or creation of wildlife movement corridors and linkages across

HOW TO ATTRACT BIRDS TO YOUR GARDEN

Brown Honeyeater (Photo: GC)

the landscape. Thinking of the future, wildlife and wildlife habitat are a part of Australia's natural heritage and should be protected for future generations, and where there are rare or endangered plants, these should particularly be conserved.

Property owners may have access to incentive schemes to maintain wildlife conservation values of the property (see page 44 for further details).

It is best to aim for a complex habitat, one with many layers, including tree and understorey habitats, log and rock habitats, native grasslands and creek systems (or farm dams) and their associated vegetation. A complex habitat supports a greater diversity of wildlife because most animals are dependent on more than one type of habitat and different species are adapted to different habitats.

When planning your house and its surrounds, construct roads and tracks in a manner that least impacts on remnant native vegetation. Throughout the property, and especially near creeks and farm dams, native vegetation, including understorey trees and shrubs, should be preserved, and native species planted to stabilise stream banks and improve water quality. Natural regeneration should be encouraged and a ground cover of logs, leaf litter and low vegetation preserved, except close to buildings, where it might potentially carry fire.

Large dead native trees, especially ones with hollows, should be preserved, as hollows provide nest sites for a range of animals, including lorikeets and other parrots. In most areas, nesting sites are in short supply and provision of fauna nest boxes can replace lost natural hollows.

Those who keep stock should install fauna-friendly fencing and control direct access of stock to creeks and dams to avoid damaging native vegetation. Snags (fallen logs) should be left in watercourses as habitat for aquatic fauna. Pets should be kept in at night and not allowed to wander (see page 36) and pest animals should be controlled..

Think twice about using pesticides and animal traps. Small insects, slugs and snails are food for lizards, gliders, birds and insectivorous bats. Poisons such as rat bait will enter the wildlife food chain if wildlife eat the affected rodent or die from eating the bait. Any pesticides, herbicides and other chemicals should be disposed of with care, to prevent contamination of creeks and farm dams.

Any hazard reduction burning should be undertaken with extreme care, careful planning and a permit.

How do I attract native birds into my garden?

To attract birds, a good start is to supply water in a birdbath or large, glazed terracotta pot plant dish on a couple of

Male King Parrot (Photo: GC)

The Eastern Spinebill is a nectar-feeder (Photo: GC)

bricks, placed near shrubbery (unless there are cats about) to provide refuge close by. Water should be changed daily and the dish cleaned regularly.

For your garden, choose native plant species that provide tree cover for shelter and nesting all year round. Choose hardy plants that can be a source of food in the fruit, blossom, bark, sap or leaves of the plant.

Numerous tree species attract birds. Lorikeets love the blossom of eucalypts, which flower at different times of the year, and also the wheel of fire tree flowers (*Stenocarpus sinuatus*). The red bottle brush (*Melaleuca viminalis*) is a good source of nectar for honey-eaters, as well as for the Eastern Spinebill, and the various figs and native tamarind (*Diploglottis australis*) are sought by the fruit-eating birds as fruit ripen. White cedar (*Melia azedarach*) fruits are enjoyed by fruit eating pigeons, fig birds, orioles and Lewin's honeyeaters. King parrots are fruit eaters and are attracted to hop bushes (*Dodonaea* spp.). Practically all flowers bring insects which are important to birds – directly as food for some adult species, and for most species as high-protein nestling food. Grasses provide seed for finches.

Various birds are common inhabitants of lantana thickets, particularly whip birds and wrens. When getting rid of lantana, it is best done progressively, replanting with natives as you do so. Potential natives that have a somewhat comparable effect are poison peach (*Trema aspera*), Brisbane wattle (*Acacia fimbriata*), *Pittosporum viscidum*, and perhaps *Pultenaea* and *Daviesia* spp.

The aggressive noisy miner is no friend to other native birds, mobbing them and chasing them away. The noisy miner favours a woodland environment with a mown understorey, so if you want to attract smaller birds, mown lawns are not the way to go. Better to plant and promote a complex understorey including vines and shrubs. It is not only food trees that attract birds but also the structure of vegetation, particularly for smaller birds seeking nesting sites and protection. Thus a vegetation complex of many layers is more useful than a single tree or shrub stratum

How do I attract native butterflies?

Many butterfly species are attracted to a wide range of both native and exotic

Richmond Birdwing butterfly (Photo: RS)

nectar-bearing flowers when they are in their adult form. A good native species that attracts butterflies is native pavetta (*Pavetta australiensis*).

For butterflies to flourish, it is essential that the food plants for their caterpillars be present. The local extinction of the birdwing butterfly vine (*Pararistolochia praevenosa*) is responsible for the disappearance of the beautiful and once-common Richmond birdwing butterfly from our district. Over recent years there has been a major effort, supported by the two catchment groups, to plant the vine in our district.

Although some butterflies are very specific over the food plants for their caterpillars, some others have much more catholic tastes. More than 130 species of butterfly have been recorded in the Moggill Creek catchment and they are listed on the MCCG website, together with the food plants for their caterpillars. Just a few we could mention are listed below.

More people ask about attracting butterflies than moths, but there are numerous moth species, many very attractive. They too need food plants for adults and caterpillars.

Should I fence my land?

If you do not intend to keep stock on your property, there is a lot to be said for **not** fencing. Fences potentially cut wildlife corridors and prevent the free movement of wallabies. If the objective is a privacy screen, then consider planting hedges or bushy native plants rather than constructing a fence. However, fences may possibly be beneficial in discouraging feral deer, an increasing problem in our district.

Uncontrolled grazing by stock is not compatible with sound native vegetation management. Fencing-off natural or revegetated areas, so that grazing stock cannot enter, should assist natural regeneration to occur and protect any planted trees.

Fencing is also to be recommended where a creek passes through or alongside grazed pasture. Grazing livestock should be excluded from creekside vegetation as they can cause considerable damage to

BUTTERFLY	A FOOD PLANT FOR CATERPILLARS
Blue triangle	Three-veined laurel (*Cryptocarya triplinervis*)
Bordered rustic	Flintwood (*Scolopia braunii*)
Large yellow	Coffee bush (*Breynia oblongifolia*)
Fourbar swallowtail	Zigzag vine (*Melodorum leichhardtii*)
Jezebel nymph	Native mulberry (*Pipturus argenteus*)
Yellow migrant	Brush senna (*Senna acclinis*)

native plants as well as fouling the water and increasing likelihood of erosion of creek banks.

Fauna friendly fencing on your property can either allow animals to pass through (inclusion fencing) or prevent or exclude them from passing through (exclusion fencing). Inclusion fencing allows animals such as koalas, kangaroos, wallabies, bandicoots, echidnas, lizards, turtles, possums and gliders through to find food, shelter, a mate or new territory. Exclusion fencing can prevent access to dangerous areas (e.g. roads, swimming pools, domestic dogs and cats) or prevent domestic dogs and cats from gaining access to native animal habitat areas. Pool fencing (required by Brisbane City Council) should be designed to exclude animals. Leave a wooden plank or buoyant object in the pool in case an animal does fall in.

There are a number of issues to consider when constructing fauna friendly fencing. Barbed wire and electric fencing should obviously be avoided as these can cause injury or death to native wildlife. Passage for animals can be facilitated by leaving a 50 cm gap underneath any style of fence, leaving gaps at corners. An old car tyre, supported between two wire strands in a fence, in the middle of a panel, can make it easy for wallabies to transit without injury. Many native animals can easily climb wooden fences and chain wire and a wider top rail on the fence can become an animal walkway. Another consideration is to retain – or plant – trees and shrubs or place prop logs against the fence on both sides to provide shelter and climbing opportunities for arboreal mammals.

Pardolote nest destroyed by a marauding cat (Photo: BH)

How do I become a responsible pet owner?

When pets roam into natural areas they have a significant impact on native wildlife. It is important for landowners to take responsibility for their pets to protect natural areas.

Property owners can do their bit to protect natural areas from the impact of uncontrolled pets by the installation of appropriate fencing or cat enclosures and keeping any gates closed. Those who wish to keep a cat should have it de-sexed, registered with a name tag or micro-chip and keep it inside or secured from dusk to dawn. Leaving uneaten food outside attracts pest animals, including rats and feral cats and dogs.

Dogs should always be walked on a leash, particularly in natural areas and never allowed to chase birds or other native animals. For the sake of other walkers, it is a courtesy to clean up your dog's droppings.

Contact the Council on 3403 8888 for further information on responsible pet ownership, stray animals, the Animals Local Law 2003, animal shelters or questions relating to specific natural areas.

Caring for injured wildlife

Sometimes injured animals are found on your own land or more often along roadsides. Across the western suburbs of Brisbane a growing number of volunteers are becoming experienced and dedicated wildlife carers. Wildlife care volunteers provide a free service to the public and to our wildlife by rescuing, caring for and rehabilitating injured, sick and orphaned native wildlife. Wildlife carers need help to support the good work that they do and also for release sites for animals that have recovered from injuries.

For more information or if you wish to provide a donation to Pullen Pullen Catchments Group Wildlife Care Assistance Program contact the Program Coordinator on wildlife@pullenpullencatchment.org.au.

I want to keep some livestock; how should I do it?

Keeping ponies or horses in our district is popular, and there are also small herds of cattle and alpacas. Brookfield and Pullenvale would not be the same without horses!

On small properties there is always a temptation to keep too many animals. Overgrazing is a widespread problem, leading to areas of bare soil and increasing amounts of unpalatable plants such as giant rat's tail grass. In our extremely variable climate, almost any month can be the driest month in the year and it is difficult to overcome the adverse effects of overgrazing. Sparse ground cover increases the erosion risk from the large episodic rainfall events that are not uncommon during extended dry periods. Management of grazing pressure aims to maintain continuous groundcover, with enough vegetation to protect the soil surface from heavy rain, and to maintain vegetation for bank stability and for wildlife and in-stream habitat. In general, timing, intensity and duration of grazing on your property all need to be considered.

As a general rule, grazing should be restricted or prevented altogether when plants are starting their annual growth cycle or when land is subject to flooding such as during summer when maximum rainfall is expected. By monitoring the impact of grazing throughout the year, you will be able to assess whether grazing intensity is too high or too low, and to move stock or reduce stock numbers before vegetation degradation occurs.

Probably the best-adapted pasture grass in our area is Rhodes grass (*Chloris gayana*), although some owners have sown signal grass (*Urochloa decumbens*). The latter species, although palatable to cattle, is locally reputed to be unpalatable to horses. Where artificial fertilizers are used, care should be taken to avoid over-fertilizing, with consequent adverse effects on any adjoining creek.

Controlling stock access and grazing to stream banks and riparian vegetation is an important step in sustainable property management. Horses, cattle and other domestic stock can damage waterways and creek side vegetation if they have uncontrolled access to stream banks. Stock tracks, over grazing, trampling and compacting of soil along stream banks can cause bank erosion, weed invasion,

loss of wildlife habitat and damage to in-stream ecosystems. Animal dung can wash into waterways when it rains, causing an increase in nutrient levels and sediment in creeks, resulting in reduced water quality. For further information about management of horses on small properties, see publications by J. Myers, below.

Fencing and setting up off-stream watering points for horses and other domestic stock will reduce their adverse effects on waterways. The type and location of fencing, the type of stock, the size and shape of the stream channel, the frequency of flooding, and size of the flood peak are important factors in planning riparian fencing. Pumping water from a creek for off-stream watering points requires a permit, and landholders should be aware of restrictions included in the Queensland Water Act 2000.

Management of grazing pressure aims to maintain continuous groundcover, with enough vegetation to protect the soil surface from heavy rain, and to maintain vegetation for bank stability and for wildlife and in-stream habitat. In general, timing, intensity and duration of grazing on your property all need to be considered.

What are the common pest animals in our area?

Pest animals are generally any exotic or introduced animals that have an adverse economic, environmental or social effect. Many of Australia's pest animals, such as feral cats, wild dogs, european foxes, deer and rabbits are declared under the Land Protection (Pest and Stock Route Management) Act 2002. Other animals that impact negatively on natural areas are cane toads, and all these species are listed in the Brisbane Invasive Species Management Plan July 2007 – June 2011 as Pest Animals of Significance to Brisbane. The European honey bee is listed as a fauna species "requiring special investigation".

Wild Deer

There are three species of wild deer which are becoming increasingly common throughout western Brisbane – rusa deer (*Cervus timorensis*), fallow deer (*Dama dama*), and red deer (*Cervus elaphus*).

As well as competing with native wildlife for resources, deer kill native trees by stripping off bark and ringbarking them, associated with antler maintenance, and damage vegetation by trampling and grazing. They also damage home gardens and crops.

On roads, deer can be a traffic hazard. Stags can be aggressive during the breeding season and deer also carry various diseases and parasites.

The Queensland State Government has recently (May 2009) declared feral deer to be pest animals. Rusa (and chittal deer, not in our district) are now classed as Class 2 Pests and fallow and red deer, Class 3 Pest Animals.

Landowners sighting deer on their properties are encouraged to phone Council on 3403 8888 to report and express their concern.

Wild Dogs and Feral Cats

A wild dog is a free ranging dog without an owner. This includes domestic dogs that have become feral, dingoes and dingo hybrids. A feral cat is the common house cat that, if abandoned, will readily revert to a feral state.

Both wild dogs and feral cats are declared Class 2 pest animals under the provisions of the Land Protection (Pest and Stock Route Management) Act 2002. They pose a serious threat to native wildlife and domestic animals. It is the responsibility of the landowner to take all reasonable steps to keep their property free of declared pests.

Fencing to exclude pest animals – particularly cats – is difficult. Cats and dogs can be trapped humanely using soft catch rubber-jawed foot-hold traps and cage traps, used humanely, and the RSPCA contacted. Potential food sources for feral animals should be avoided, for instance, food scraps should not be left in the open, but disposed of in a compost heap or bin.

If you wish to create a wildlife feeding station, it is important that it can not be ambushed by a feral cat. (Most wildlife experts discourage feeding stations, particularly for carnivorous birds, as encouraging carnivorous birds puts smaller birds – particularly nestlings, at risk.)

The Brisbane City Council Pest Management Program can assist landowners with pest animal inquiries, pest management advice and assistance. For further information, phone 3403 8888.

Cane toads

Cane toads are a ubiquitous pest around Brisbane, responsible for the death of animals that eat them and competing for food, shelter and breeding sites with native animals. While cane toads are regarded as a pest species throughout the region, wanton cruelty is to be deplored and they should be destroyed humanely. One recommended method is by freezing.

Handy Resources

Brisbane City Council (2007). Brisbane Invasive Species Management Plan July 2007 – June 2011. 155 pp.

Brisbane City Council (2007). Green Choice Gardening in Brisbane. Third Edition. 53 pp.

Brisbane City Council (various). Pest Animal Management Fact Sheets www.brisbane.qld.gov.au

Dept Environment and Resource Management (various). Pest Animal Management Fact Sheets www.derm.qld.gov.au

Lindenmayer, D., Claridge, A., Hazell, D., Michael, D., Crane, M., MacGregor, C. and Cunningham, R. (2003). Wildlife on Farms. How to Conserve Native Animals. CSIRO.Publishing. 117 pp.

Low, Tim. (c. 1993). Dinkum Gardening. Greening Australia, Queensland. 60 pp.

Myers, J. (2005). Managing Horses on Small Properties. Landlinks Press. 224 pp.

Myers, J. (2005). Horse Safe: A Complete Guide to Equine Safety. Landlinks Press. 184pp.

Myers, J. (2007). Managing Horses on Small Properties in the Moggill Creek Catchment. Moggill Creek Catchment Group. 39 pp. (free booklet}

Ryan, Michelle (ed.) (1995). Wildlife of Greater Brisbane. Queensland Museum. 340 pp.

RSPCA www.rspca.org.au

Sands, D.P.A. (2004). Butterfly Checklist for the Moggill Creek Catchment. MCCG. 13 pp. (see also www.moggillcreek.org.au)

Walraven, E. (2004). Care of Australian Wildlife. For Gardeners, Landholders and Wildlife Carers (Revised Edition). New Holland Publishers. 140 pp.

{Appendix 1}
Wildlife and Conservation Organizations

Pullen Pullen Catchments Group
A Landcare Group

Pullen Pullen Catchment Group Inc. (PPCG)

Pullen Pullen Catchments Group (PPCG) is a non-profit, community based, volunteer organisation formed as a Landcare Group in 1999. The Group's vision is to help people to enjoy, value and connect to the environment and community through education, active bushcare and community events.

PPCG currently (2009) has three active Bushcare Groups, supported by Brisbane City Council's Habitat Brisbane Program. These are the Anstead Bushland Reserve (Hawkesbury Rd, Anstead), Pullenvale Forest Park (Pullenvale) and John Wilson Reserve (Glenhurst St, Pinjarra Hills).

PPCG's Vision is to Recover Environments through Active Bush Care (ABC) and Teaching (the) Local Community (TLC).

PPCG also supports a Wildlife Care Assistance Program – for more information or if you wish to provide a donation, contact the Program Coordinator on wildlife@pullenpullencatchment.org.au

Pullen Pullen Catchments Group Inc.	
Post	PO Box 1390, Kenmore Qld 4069
Web	www.pullenpullencatchment.org.au
Email	contactus@pullenpullencatchment.org.au

(Photo: AM)

Moggill Creek Catchment Group

Moggill Creek Catchment Management Group Inc. (MCCG)

The Moggill Creek Catchment Management Group Inc. (MCCG) is a volunteer community action group aiming to conserve and improve the local environment of the Moggill Creek catchment on both private and public land. Projects include revegetation and the planting of locally native flora species on public and private land as well as promoting good environmental management throughout the local community. MCCG runs a plant nursery (with support from PPCG members), from which it provides free locally-native plants to members of both groups for revegetation projects.

There are currently (2009) nine active Bushcare Groups working in the area. Whilst the work that these volunteers undertake on public land is important, private landholders have contributed significantly to MCCG's catchment-wide objectives. Their input has seen 14 Voluntary Conservation Agreements negotiated for Moggill Creek catchment. Landholders also involve themselves in extensive replanting of native species, particularly on acreage properties.

The MCCG vision for the Moggill Creek catchment and neighbouring catchments is to conserve and enhance the environmental values in the region, recognising that these catchments interlink to provide a "range to river corridor", vital not only to the fauna and flora within the catchments, but also to the rivers and Moreton Bay.

MCCG's priorities:

- Rehabilitating Habitat Corridors
- Managing Exotic Weeds
- Improving Water Quality
- Managing Fire Risks
- Planning for the future

MCCG is registered as a charitable organization and donations are tax deductible.

To contact the group:

Moggill Creek Catchment Management Group Inc.	
Post	PO Box 657, Kenmore QLD 4069
Web	www.moggillcreek.org.au
Email	mccgsecretary@live.com.au

{Appendix 2}
Wildlife Conservation Partnerships

Wildlife Conservation Partnerships Program

To help encourage and assist landholders to protect and restore the wildlife habitat on their land, Brisbane City Council developed the Wildlife Conservation Partnerships Program (WCPP). The WCPP enables private landholders to enter into agreements with Council to gain assistance to protect or restore the habitat on their properties. Participation in the program is entirely voluntary and has no effect on the landholder's ownership rights.

The WCPP offers practical advice and assistance to landholders as to how they can protect and/or restore and manage the wildlife habitat on their property.

Under the program, Council's extension officers visit properties and provide advice on weed identification and control, native plant identification and restoration, general rehabilitation techniques, pest animal species and how to control them, fauna-friendly fencing, nest boxes, plant propagation, fire management, erosion and sediment control, and tree planting.

The WCPP offers four types of agreements. Each agreement offers different levels of protection and assistance according to the landowner's needs. These agreements are:

- Land for Wildlife
- General Voluntary Conservation Agreement
- Higher Voluntary Conservation Agreement
- Voluntary Conservation Covenant

If you are interested in receiving assistance with protecting and enhancing the habitat values of your property please contact:

Brisbane City Council's Wildlife Conservation Partnerships Program	
Phone	07 3403 8888
Email	wcpp@brisbane.qld.gov.au

Other Wildlife & Conservation Organisations & Networks:

Wildlife and Native Plants:

Wildlife Preservation Society of Qld	
Web	www.wildlife.org.au
Qld Frog Society Inc.	
Web	www.qldfrogs.asn.au
Birds Queensland – Queensland Ornithological Society Inc	
Web	www.birdsqueensland.org.au
Bats Rescue Inc.	
Web	www.batrescue.org.au
Nest boxes for wildlife	
Web	www.hollowloghomes.com.au
Richmond Birdwing Recovery Network Inc.	
Web	www.richmondbirdwing.org.au

THECA (The Hut Environmental and Community Association Inc.)	
Web	www.theca.asn.au
Society for Growing Australian Plants, Qld Region, Inc.	
Web	www.sgapqld.org.au
Brisbane Rainforest Action and Information Network	
Web	www.brisrain.webcentral.com.au
Greening Australia Qld	
Web	www.qld.greeningaustralia.org.au
Rural Environment Planning Association Inc. (REPA)	
Web	www.repa.org.au

Injured Tawny Frogmouths in Care (Photo: IR)