

randwick environmental park



interesting facts

- There are 13 hectares of parkland, bushland and wetland.
- It is the only park in Randwick City that is zoned 7- Environmental Protection.
- 92 species of indigenous plants have been identified to date
- Four plant species recorded here are found at only one other location in the Eastern Suburbs.
- Randwick Environmental Park contains 3.6 hectares of Eastern Suburbs Banksia Scrub (ESBS), an endangered ecological community.
- Randwick Environmental Park is home to the endangered Sunshine Wattle.
- The bushland and wetland provides valuable habitat for native birds, lizards, frogs and mammals.
- Randwick Environmental Park is one of the few non-coastal bushland reserves of the eastern suburbs.



Eastern Suburbs Banksia Scrub

history

The park was originally part of the Randwick Army Barracks. During World War 1 the barracks included a rifle range and horse riding training ground. The wetland at this time was a smaller, shallower depression roughly located in the centre of the southern circular section of the current wetland.

Aerial photographs from 1930 onwards provide interesting evidence of the land use of the park area.

1930s

The wetland is a roughly circular depression in the current location of the southern half but it appears to have been mechanically altered around its banks. A new housing estate (Holmes St Maroubra) is constructed south of the reserve.

1940s

Considerable changes take place as World War 2 facilities are constructed; rows of large storage sheds are erected across the eastern part of the Randwick Barracks, three sheds covering the area the Community Centre now occupies.

1950s

The bushland is cleared and the sandhills driven over by vehicles. The wetland is further excavated and expanded to the north.

1960s

Stormwater is flowing into the wetland from the south east and the southern side of the wetland is defined with a dam wall. A new sewer line is installed running south from Bundock Street to Henning Street (now under the concrete path and Burragulung Street). The Housing Department estate is built north east of the Reserve.

1970s

The oval playing field, now the picnic area, is created. The bushland is beginning to regenerate on the slopes. The stormwater inlet in the south east corner of the wetland is formalised to drain the new housing area south east of the reserve on the Maroubra hill.

1980s

Moverly Green housing estate is built to the east of the reserve.

1990s

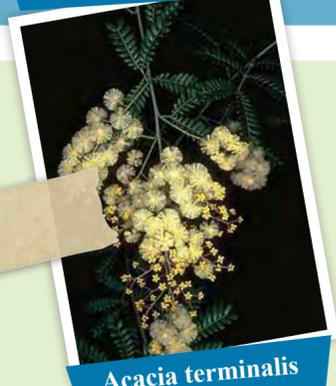
The large sheds to the west are gradually removed leaving large slabs of concrete.

2000 – 2010

A re-development process was commenced by the Department of Defence. Remnant bushland on Bundock Street and south west of the wetland was cleared. Randwick City Council defended the conservation values of the park, ensuring the remaining bushland was preserved, zoned the bushland for environmental protection and conditioned the Randwick Barracks' development to protect the environmental values of the reserve.

2010

Randwick Environmental Park was transferred from Commonwealth to Randwick City Council ownership and the reserve was opened for the enjoyment of the community and conservation of its flora and fauna.



Acacia terminalis



Aerial photo 1930



Aerial photo 1955



Aerial photo 1975



Aerial photo 1999



Aerial photo 2009

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local geology

The soils of Sydney were formed about 230 million years ago, during the Triassic period, when Australia was part of the Gondwana supercontinent. Rivers eroded inland mountains and deposited sediment up to 50 m deep in what is now known as the Sydney basin. Over time, the weight and pressure of these layers of sediment cemented the sandy particles into sandstone and the finer silts and clays to mudstone and shale. These sedimentary layers are divided into three types, the older Narrabeen Group sandstones and shales, the sandy middle beds of the Hawkesbury Sandstone, and the uppermost and youngest strata of compressed silt and clay, the Wianamatta Shale.

In the eastern suburbs of Sydney the Wianamatta Shale has been completely eroded away. The underlying sandstones have also been significantly eroded, creating the sands most obviously seen in local beaches. These old sands have been shaped by the wind in great undulating sheets forming sand-hills across much of the eastern suburbs. (Department of Mineral Resources, 1983).

Outcroppings of sandstone occur on the coast where more recent coastal winds have blown the sands away, or where the sea has eroded further into the sandstone. Freshwater swamps filled the low-lying areas between the older sand-dunes. A series of swamps formed on the western edge of the eastern suburbs sand sheet creating the Botany Wetlands.

Over time, plants and animals decayed, and rain washed minerals through the sand, developing layers. The surface layer, being predominantly organic, appears dark grey or black. The middle layer is light grey or white sand, as it is free of organic material and coloured minerals. Below this the layer is orange to dark brown 'coffee rock', a soft, sandy 'stone' coloured by leached minerals such as iron. The sands are naturally porous and consequently highly leached and deprived of nutrients.

Coastal vegetation



Eastern Suburbs Banksia Scrub soil



A typical eroded soil profile of the eastern suburbs



Aerial photo 1961

topography and soils

Randwick Environmental Park is generally flat, rising to 52 metres above sea level just east of the picnic area. The sites lowest point is 28 metres above sea level at the base of the wetland.

In Randwick Environmental Park the older, wind-blown, or **aeolian**, sand dunes cover much of the park. Outcroppings of Hawkesbury Sandstone are present to the east of the picnic area and on the eastern side of the wetland.

A naturally low-lying sedge-land (as it was mapped in the late 1800s) occurred in the vicinity of the southern half of the current wetland.

From 1930 to 1961 the wetland was excavated a couple of metres and extended to the north to form an 'L' shape. Sometime between 1961 and 1975 playing fields were created east and north of the wetland. The northern playing field is now houses, the eastern playing field is now the picnic area.

Disturbance of the original soil profile has occurred across the site over the last 100 years. This is evident by the colour of the upper-most soil horizon, and by examining aerial photographs from the 1930s onward. Most of the disturbance was superficial and confined to the surface layer, allowing the native plants to regenerate from seed stored in the soil.

site hydrology

The wetland is an 'ephemeral' wetland, meaning it is only temporarily inundated with water. In fact the wetland is dry up to 85% of the time. Constant seepage of the wetland occurs through the sandy substrate, percolating into the water table draining to the south-west and replenishing the Botany aquifer.

Prior to human intervention, surface water from the surrounding northern and eastern slopes, would have drained into a swampy sedge-land. Today, water flows into the wetland from four stormwater lines .

These pipes are located under the eastern and southern viewing platforms, at the crook of the 'L' and into the creek in the south eastern corner near Henning Street.

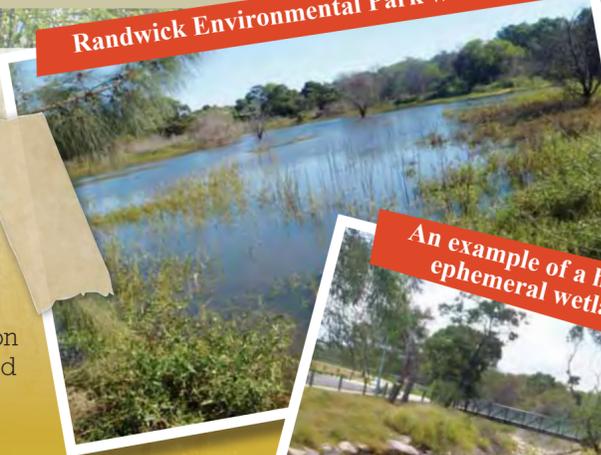
Each outlet includes a gross pollutant trap: a cleanable trap that collects litter, silt and green waste.

The Henning Street outlet includes a man-made creek with a rock-lined **riparian** zone, and vegetation on each bank, slowing the water and preventing soil erosion.

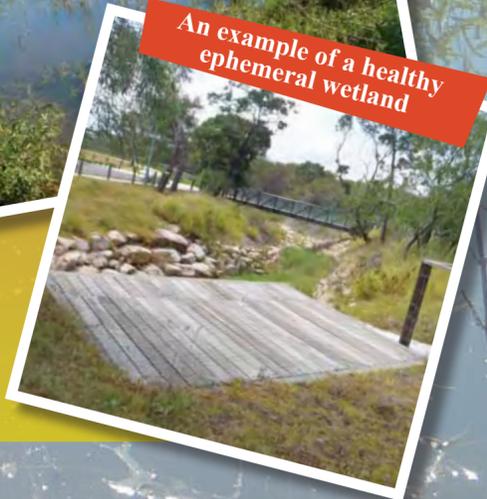
Notice the change in appearance of the vegetation at each outlet - heavier weed infestations are a result of the nutrients dissolved in stormwater.

A large overflow grate is visible at the southern end of the wetland. This drains excess water when the level of the wetland reaches 32.5 m above sea level to the major stormwater outlet at Lurline Bay.

Randwick Environmental Park wetland 2011



An example of a healthy ephemeral wetland



randwick environmental park

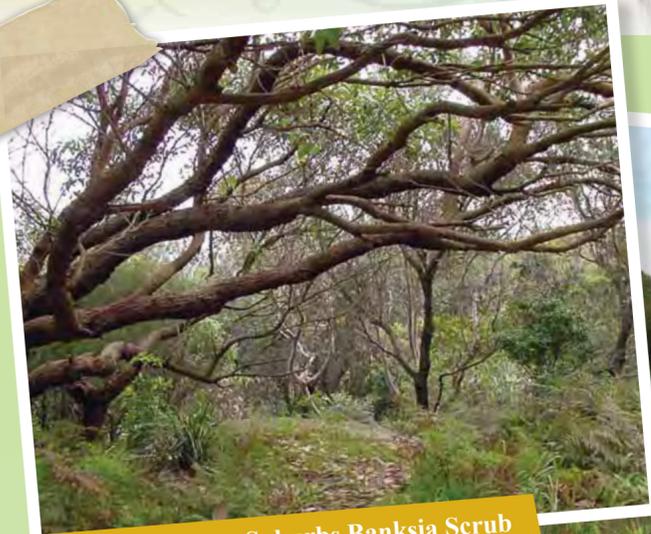
vegetation

Australia's natural vegetation is categorised according to the types of plants present, their height and density. These are called plant communities. In the eastern suburbs of Sydney a range of plant communities existed prior to European occupation, such as woodland on sandstone, dry heath on sandstone, scrub on sand and freshwater sedge swamp.

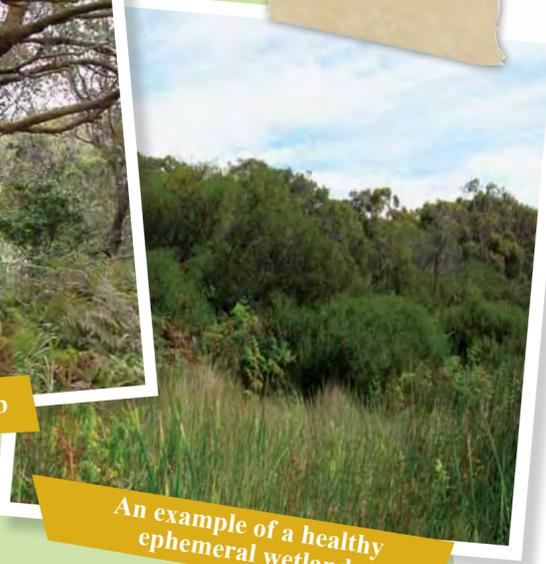
The dominant plant communities in Randwick Environmental Park are **scrub on sand**, **scrub on sandstone** and **freshwater swamp**. These plant communities prefer the older wind-blown sand dunes deposited into the eastern suburbs after the last Ice Age about 10,000 – 15,000 years ago.

The scrub on sand vegetation in Randwick Environmental Park is further classified as **Eastern Suburbs Banksia Scrub** (ESBS). This scrub is made up of plants species that prefer the deep, nutrient poor sands and generally have dry-textured (sclerophyllous) small leaves. Many plant species in Eastern Suburbs Banksia Scrub have a **sympiotic relationship**, or mutually beneficial relationship, with soil micro-organisms living in their roots. These relationships allow the plants to extract nutrients from the poor soils and give the micro-organism a host as they cannot exist outside a plant.

Characteristic plant species of Eastern Suburbs Banksia Scrub include *Banksia aemula* (after which it takes its name), *Banksia serrata*, *Lepidosperma laterale*, *Leptospermum laevagatum*, *Monotoca elliptica*, *Pimelia linifolia*, and *Dianella revolute*. However, over 100 plant species may make up the plant community and possibly hundreds of microscopic soil organisms such as fungi and bacteria species.



Healthy Eastern Suburbs Banksia Scrub



An example of a healthy ephemeral wetland

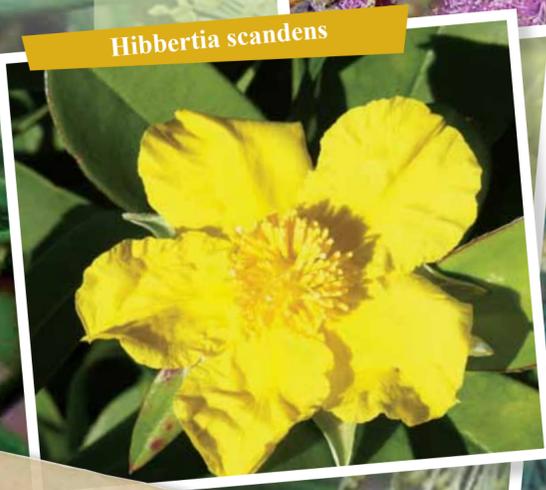
Two small areas of **scrub on sandstone** occur in Randwick Environmental Park. One is a dry area on the eastern side of the wetland, with a mix of plant species similar to the Eastern Suburbs Banksia Scrub. The other is located to the east of the picnic area where natural seepage of water occurs from the natural rock outcrop. Moisture-loving plants can be found such as *Blechnum* sp, *Centrolepis fascicularis*, *Gleichenia dicarpa*, *Isolepis nodosa*, *Lobelia alata*, *Persoonia lanceolata* and *Pittosporum undulatum*.

Due to disturbance in the past, the wetland does not have the original mix of plant species representative of a **sedgeland**. However, because wetland plant species are carried around on the feet and feathers of water-birds, and they are able to survive long periods of dry, many have either been re-introduced or have survived in the base of the wetland. Quite a few weed species are present in the wetland, carried in by stormwater from gardens in the surrounding houses and thriving in the moist, nutrient rich silt. Old plastic litter is also visible on the shoreline, deposited in the wetland from before 2000 when gross pollutant traps were installed on the stormwater pipes.

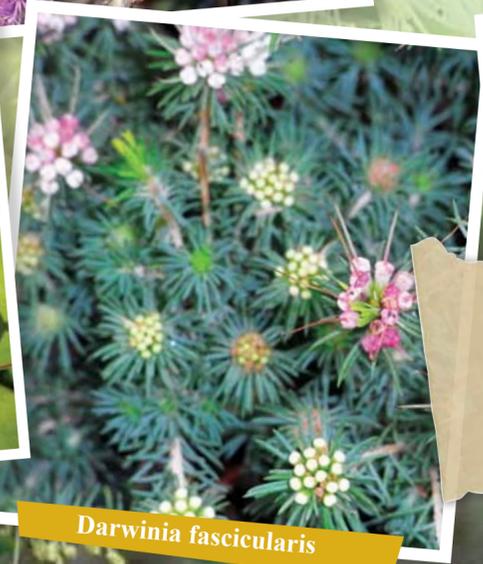
Randwick Environmental Park also contains a population of the Sunshine Wattle, *Acacia terminalis* ssp. *terminalis*, a species of wattle listed as endangered under NSW's Threatened Species Conservation Act (TSC Act) and the Commonwealth's Environment Protection & Biodiversity Conservation Act (EPBC Act). This wattle species only occurs in a coastal area of 23 km from North Head to Botany Bay and was one of the first Australian plants collected by Sir Joseph Banks in 1770. A State and National draft recovery plan has been developed for this species to identify actions to be taken to ensure the long-term viability of this species.



Melaleuca thymifolia



Hibbertia scandens



Darwinia fascicularis



Melaleuca nodosa



Eriostemon australasius

Randwick Environmental Park

managing our native flora & fauna

The major threats to the preservation of native bushland, including Eastern Suburbs Banksia Scrub, are; clearing, fragmentation, weed invasion, increased nutrients, storm water runoff, infrequent and too frequent fire regimes, grazing by rabbits, rubbish and garden waste dumping, inappropriate plantings and vandalism.

The **resilience**, or ability to regenerate after disturbance, of Eastern Suburbs Banksia Scrub is relatively high compared to other Australian ecological communities. The seeds of the plant species that evolved to live on the sand, are able to survive sand movement and burying for many years. In Eastern Suburbs Banksia Scrub remnants where the vegetation has been removed but the 'A' soil horizon is still intact, then regeneration of the Eastern Suburbs Banksia Scrub is possible. This is because of the continued presence of the necessary soil micro-organisms and the soil **'seed bank'**.

At Randwick Environmental Park the vegetation is fairly open. However without the beneficial effect of fire over the past 20 to 30 years, the larger plant species *Kunzea ambigua* and *Melaleuca armillaris* have begun to dominate in many zones. This reduces **species richness**, the variety of species in a given area, as they shade out smaller or less vigorous species and prevent seed germination.

conserving eastern suburbs banksia scrub

Eastern Suburbs Banksia Scrub was very easy to clear for suburban expansion and in the last 100 years the majority has been removed. From an original area of 5,300 hectares, only 146 hectares (3%) remain, much of these in small, isolated remnants.

Only 33 hectares of Eastern Suburbs Banksia Scrub are located within conservation reserves; Botany Bay National Park, Sydney Harbour National Park and 4 hectares in Randwick Environmental Park.

Consequently this plant community, together with the soil, its micro-organisms and the seeds in the soil, has been declared an **'endangered ecological community'** under NSW's Threatened Species Conservation Act (TSC Act) and the Commonwealth's Environment Protection & Biodiversity Conservation Act (EPBC Act).

The remaining remnant patches are often small and damaged with only some of the representative plant species present in each one. This does not reduce their conservation value, rather, it reinforces the need for conservation of every last remnant; if each remnant was cleared because it did not contain every plant species, then no Eastern Suburbs Banksia Scrub remnants would remain and the ecological community would be **extinct**.

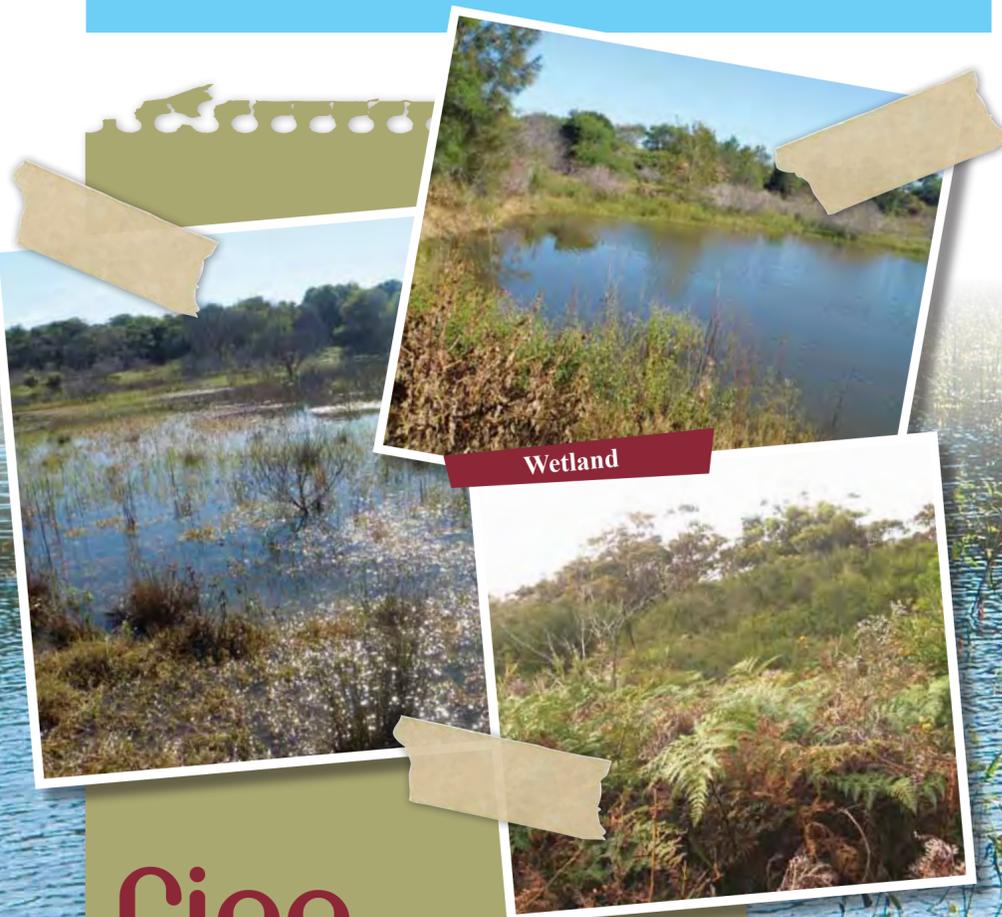
The Dept of Environment, Climate Change and Water (DECCW) has published a Recovery Plan for the Conservation of Eastern Suburbs Banksia Scrub which must be implemented by all landowners who own an area of Eastern Suburbs Banksia Scrub. DECCW has also published the 'Best Practices Guidelines for the Management of Eastern Suburbs Banksia Scrub'. Randwick City Council manages its six remnants of Eastern Suburbs Banksia Scrub in accordance with these documents.

The objectives of the Best Practices guidelines include the reduction of **threatening processes**. The major threatening processes which affect Randwick Environmental Park today are;

- weed invasion,
- the dumping of rubbish and garden waste,
- the introduction of the exotic parasitic fungi, *Phytophthora cinnamomi* and,
- predation of native fauna by foxes,
- Trampling and clearing.

Council's bush regeneration activities are designed to reduce and eliminate these threatening processes. As this is the first active conservation work undertaken in Randwick Environmental Park, it will take a few years before there is a noticeable improvement in the condition of the bushland. Council has already undertaken survey work to identify the flora and fauna of the reserve and this will continually be updated as items are discovered.

In the last hundred years considerable excavation and land-filling has been undertaken on the perimeter of Randwick Environmental Park. Over the next few years this landfill will be cleared of weeds and stabilised with local native plants.



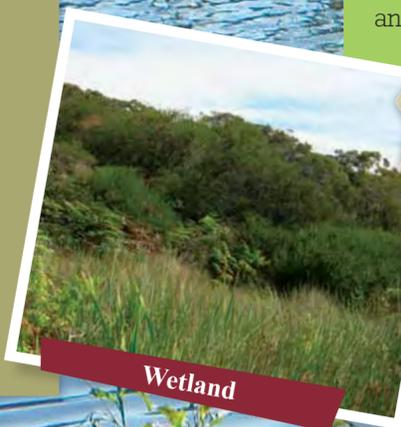
Wetland



Eastern Suburbs Banksia Scrub Soil Profile



Bird Nest



Wetland



2009 Eastern Suburbs Banksia Scrub

Micromyrtus ciliata

Fire

Prior to European settlement, bush fire would have been a natural occurrence in the Sydney region bushland and many local native plants have evolved to depend on the occasional fire, approximately every 5-12 years to complete their reproductive cycle.

A bush fire has not occurred in Randwick Environmental Park for over 20 years. This may affect the long term survival of some plant species in the reserve.

randwick environmental park

invasive species

weeds

In some zones in Randwick Environmental Park low levels of weed infestation indicate that the soil profile is fairly intact and the soil nutrient levels have not been increased by nutrient-rich runoff. The soil seed bank can then be assumed to be intact and viable. Bush regeneration activities are designed to stimulate the seed bank into germination to promote the cycle of plant life at Randwick Environmental Park.

In some zones in Randwick Environmental Park high levels of weed infestation indicate increased soil nutrients, particularly nitrogen and phosphorus, which are found in the faeces of dogs and cats, garden waste and lawn clippings and blue-metal road runoff. Other weed infestations, particularly on the eastern boundary, are the result of landfill and garden waste dumping in the past. Weeds are able to colonise quickly into areas that have highly disturbed soils.



Alternanthera



Cortaderia



Ipomoea Indica

Many species of weeds have infested Randwick Environmental Park including;

- 2 weeds of National Significance (WONS) Bitou bush
- 8 species of noxious weeds- Lantana, Castor Plant, Green Cestrum, Pampas Grass, Blackberry, Prickly Pear, Asthma Weed and Privet
- Over 144 undesirable plant species

Many of these weeds will infest areas of good bushland and create monocultures which restrict native plant regeneration. Weeds also create suitable harbour for pest animal species such as rabbits, foxes and cats. Bitou bush berries also provide food for foxes and its seeds are spread further in fox faeces.

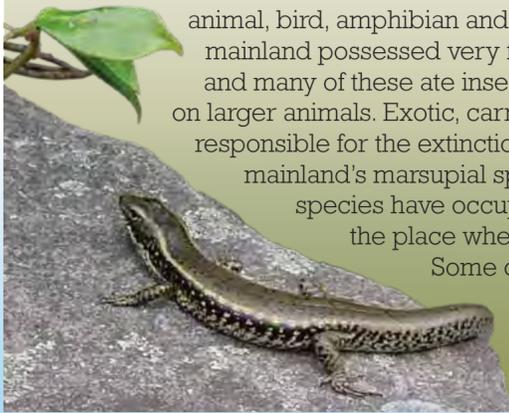


Madeira Vine

pest animals

Some exotic animals, those introduced species from other continents, have had a serious effect on native animals in Australia generally since colonisation and have contributed to the local extinction of many native animal, bird, amphibian and reptile species. Australia's mainland possessed very few carnivorous animal species and many of these ate insects, frogs and birds; few preyed on larger animals. Exotic, carnivorous animals have been responsible for the extinction of many of the Australian mainland's marsupial species while other exotic species have occupied native species' **habitat**; the place where they live, feed and breed.

Some of the pest animals are present in Randwick Environmental Park are foxes, cats, dogs, rabbits and Indian mynas.



managing pest animals

Pest animals are a problem because they;

- predate on native fauna
- compete for local food supplies
- spread weeds through transfer of seed and propagules
- drop faeces which create soil chemical imbalances and effect the growth of native plants
- feed on native seedlings

In sensitive conservation areas such as Randwick Environmental Park, the exclusion of domestic pets is recognised Australia wide as a standard management practice for the following reasons;

Lantana

the effects of phosphorus

The faeces of carnivores, (dogs, cats, foxes, humans!) contain high levels of phosphorus. Phosphorus is easily dissolved in water and gets into soil, wetlands and waterways.

Australian soils are naturally very low in phosphorus because the continent is very old. Australian plants have evolved to deal with very low phosphorus levels.

Consequently phosphorus is highly toxic to Australian plants and will quickly kill them. Phosphorus is very difficult to remove from natural systems requiring huge expense over a long time.

Plants from other parts of the world (weeds) are able to thrive in higher phosphorus conditions.

Result - bushland and wetland ecosystem are irreversibly damaged and their functioning is seriously compromised.

the instincts of cats and dogs

Cats and dogs have a natural instinct to hunt & to mark their hunting territories with urine. Their marking scent frightens native Australian fauna away.

Cats and dogs will hunt and kill birds, lizards and frogs regardless of how well fed they are.

Result - a decline in the number of fauna species able to live in the park and a decline in the size of the populations of any or all of those species.

The effect of dogs and cats is to reduce the variety of all the living things, both plants and animals, that would once have inhabited the area. This is called a 'threatening process'. It is the intent of State and Federal threatened species legislation and recommended management techniques to control and reduce 'threatening processes'.

Blue Tongue Lizard



Bird Nest

randwick environmental park



what can you do?

join bushcare

Bushcare is an Australasian-wide, volunteer movement, sponsored by local councils and landowners to help maintain bushland. The program's objective is to restore remnant vegetation and enhance and expand the habitat of native fauna. Volunteers come from all walks of life but share a passion for the natural environment.

Anyone over 16 years can become involved in Bushcare. All you need is enthusiasm for the natural environment and willingness to work in a team. Council provides all training, tools, materials and refreshments.

To volunteer in Randwick Environmental Park, contact Council's Bushcare Officer on **9399 0708** or email **Bushcare@randwick.nsw.gov.au**

enjoy!

Leave your pets at home and enjoy the wild animals in the reserve instead. Bring your binoculars and watch the bird species. Listen to the frogs and identify which species is calling. Watch out for the shy lizards sunbaking on the paths. Leave your pets at home so everyone can picnic, play games, read a book, sleep, tumble or lie on the lawns. Have a BBQ, ride a bike, take a stroll or just sit and absorb the peace!



**Bushcare
Volunteers**

