Bushland Newsletter

AUTUMN 21

On the go with Emily

The LaNina conditions have certainly delivered, with weather this summer noticeably cooler and very much wetter. The contrast with last summer is stark. These conditions will support much needed renewal in bushland throughout NSW, from once in a lifetime flush of Pink Flannel Flowers occurring in areas burnt last year in the Blue Mountains, to ideal conditions for revegetation within Randwick City. Bushland all around should be given a boost that will ensure that it looks better than ever, now and for years to come.

In recognition of the 50th anniversary of World Wetland Day, made more pertinent with the substantial rains experienced over this past summer, this edition of the Bushcare Newsletter is going to be wet! We will learn just how differently water has flowed through the landscape of Randwick City now and historically, how to better utilise water around the home and about the living wetlands supporting the rich biodiversity of our Randwick.

Emily Strautins
Randwick City Council
Bushland Officer

Nursery Update

If you have visited Randwick Council Nursery in Kingsford recently you will have almost certainly noticed something missing: the nursery glasshouses.

The glasshouses are being replaced as part of major renovations at the nursery that also include new fencing and resurfacing of the site.

The renovations began with extension of the sentinel fencing at the front of the nursery, on Barker Street, around the corner into Day Lane. The timber fencing on the western side of the nursery, shared with neighbours, is also being replaced.

The glasshouses, which had become increasingly fragile, were demolished over the weekend of February 6 and 7. The remaining work will also be scheduled to minimise disruption to nursery operations, but some disruption is inevitable. The temporary loss of the glasshouses will also have an impact on production. We apologise in advance for any inconvenience and look forward to these transformative works being completed. These changes will ensure that we can produce the best quality plants for our customers into the future.

7 March—Clean up Australia Day

Step up and create a Clean Up event for the next Clean Up Australia Day on Sunday 7 March 2021 – or any day of the year! Get your friends, family and local community group together to make an impact that improves your environment. There are now more ways than ever before that you can Step Up and Clean Up to make a difference to your community.

cleanup.org.au/get-involved-as-a-community-member

2021-2030—the UN Decade on Ecosystem Restoration.

The Decade on Ecosystem Restoration, declared by the UN General Assembly, aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity. Restoration of 350 million hectares of degraded land between now and 2030 could generate USD 9 trillion in ecosystem services and take an additional 13-26 gigatons of greenhouse gases out of the atmosphere.

"The UN Decade on Ecosystem Restoration will help countries race against the impacts of climate change and biodiversity loss," said José Graziano da Silva, Director-General of the Food and Agriculture Organization of the United Nations (FAO).

decadeonrestoration.org

Historical Hydrology of Randwick City

Old Toll Bar, Randwick Road 1865 By Samuel Elyard (*Source: State Library of NSW*).

Present day Randwick Toll House sits inconspicuously beside Anzac Parade, opposite Moore Park (*Source: Historyofsydney.com.au*)

Accounts from early colonists describe the area we now call Randwick City as a land of swamps and heath, however since their arrival there has been significant anthropogenic changes to the landscape.

For tens of thousands of years, the Gadigal and Bidjigal people of the Eora Nation thrived in this region we now call Randwick. Significant paperbark and sedge swamps occurred in several large, low-lying areas and smaller wetlands of many types would have been numerous and widespread, including depression in dune areas, along creeklines and on the coast. Despite these lush areas, the low-lying topography, porous geology and proximity to the sea, meant that many wetlands had strong marine influences. As a result, many of these waterways brackish and undrinkable.

This perhaps explains why early colonists and the growing township of Sydney experienced enduring challenges in securing sufficient drinking water, despite the fact that the settlement was situated here because of the initial observations of widespread water. In response to this, much of what is known about the original hydrology of Randwick comes from records of the ambitious engineering schemes, undertaken over the last two centuries in attempts to secure reliable sources.

Though Randwick City only fringes the Cooks River Catchment, changes to this major river paint a vivid picture of the anthropogenic changes to the landscape which occurred as a result.

View from the end of the Cooks River across Botany Bay, to modern-day headlands of La Perouse and Kurnell. Painted by Joseph Lycett 1822-23. (*Source: State Library of NSW*)

Dammed just 25 years later, this area can still be recognised by Tempe House and the Bridge which supports the Princes Highway today crossing the river in the same place. (*Source: State Library of NSW*)

As Sydney's first water source, the Tank Stream became increasingly contaminated due to urban encroachment, focus turned to the swamps and ponds south-east of Sydney town. Lachlan Swamp became the city's water second major supply from 1830, via Busby's Bore. The tunnel was dug by convicts and took over 10 years to complete. Stories from the time, suggest that the overseer of the project, mining engineer John Busby, refused to enter the bore alongside convicts. This, combined with the challenges of the local sediments which were dominated by areas of deep, loose sand, led to many deviations in the tunnels path. In 1854 a steam pump was established in what is now Alison Road, Randwick to increase flow. The bore remained Sydney's sole source of water until 1859, transporting 400,000 gallons of water a day to the corner of Elizabeth and Park Street (McCarthy & Ashton 1994).

In 1888, the land became part of Centennial Park and the swamps were incorporated into the park design. While the bore remains in existence, distinguished by a plaque in Centennial Park and a fountain at its terminus in Hyde Park, the tunnel itself has been largely filled with sand to limit subsidence and is no longer accessible.

Within the south of Randwick City, isolation mean the natural state of the lands remained for longer. The

The extensive swamplands of Matraville can be seen in this map created in 1888. (*Source: City of Sydney Archives*)

suburb of Matraville particularly, was dominated by sandhills and swamps. Interconnected surface systems linked Lachlan, Veteran's and Botany Swamplands, draining eventually into Botany Bay. During the middle of the nineteenth century these systems provided another significant portion of Sydney's drinking water. During the 1830s, the marshier areas of this watershed became sites for market gardens. These were concentrated to the fringes of the Veteran's Swamp by 1860, although at this stage still encompassed much of what is today's suburb of Matraville.

Family in flood waters in the vicinity of Storey Street 1959 (*Source: Randwick Social History Project*)

As the area become more heavily urbanised, flooding was common as historical waterways were paved over and water had little place else to go. Overtime, many naturally swampy areas were deepened to create artificial ponds or lakes, and creeklines were contained within subterranean pipelines. This mitigated the impacts of flooding by allowing surface waters to drain into designated areas. Botany Wetlands, now located within the lands occupied by Eastlakes, Bonnie Doon and the Lakes Golf courses remains the most significant of these adapted wetlands. Once a major source of drinking water for Sydney, the expansion of local industry during the 1880's led to widespread contaminations (Ashton 2008). The area is now managed by Sydney Water as a biodiversity hotspot, constituting one of the most significant areas of 'Sydney Freshwater Wetlands in the Sydney Basin Bioregion'.

Children playing in flood water after heavy rain 1925 on Cooper Street (likely near the corner with Boyce Road, looking south), Maroubra. (*Source: Randwick City Library*)

Nurses boating on the Coast Hospital's artificial lake in the 1900s. (*Source: Randwick Social History Project*)

Drying green at the Lakeside Wool Scouring Works 1899, now Botany Wetlands 1899. Wool scouring was once of the largest sources of pollution at the time, responsible for the contamination of many waterways. (Source: The Sydney Mail, 4 March 1899 (*Source: State Library of NSW*)

References:

Paul Aston (2008), Pauline Curby (2015), Maclaren North (2011), Mark Butler (2011) and Vanessa Wilton (2013) **dictionaryofsydney.org**

The Randwick Social Hisotry Project **randwick.nsw.gov.au/about-council/history/history-photo-gallery**

World Wetlands Day

2 Februry 2021

Each year, the February 2 marks international World Wetlands Day. This date commemorates the signing of the Convention on Wetlands of International Importance, or more commonly known as the Ramsar Convention, after the Iranian city in which delegates met. Marking this anniversary helps raise public awareness of wetland values and benefits, and to promote the conservation of wetlands world-wide. This year was particularly special, as it was the 50 year anniversary. Currently there are there are 170 Contracting Parties to the Convention and over 2,400 listed Ramsar wetlands globally. Australia has played an important role in this convention since it's outset, as one of the 5 founding nations. We also designated the world's first Wetland of International Importance (Ramsar wetland) under the Convention. This was the Cobourg Peninsula, Northern Territory, in 1974.

Australia now has 66 Ramsar wetlands, covering every state and territory. They cover more than 8.3 million hectares. The closest one to Randwick is Towra Point Nature Reserve, located across Botany Bay in Kurnell.

Some of the most Iconic Australian Ramsar Wetlands include:

- Kakadu National Park (NT)
- Roebuck Bay (WA)
- Gippsland Lakes (Vic)
- Moreton Bay (Qld)
- Blue Lake (NSW)
- Macquarie Marshes (NSW)
- Coorong (SA)

Jim Jim Creek, Kakadu National Park is one of Australia's Iconic Wetlands protected under the Ramsar Convention (*Source: Dietmar Rabich*)

More about water

Australia is the driest populated continent on earth yet, according to sustainability expert Caitlin McGee, Australians are the greatest per capita consumers of water in the world, using an average of 100,000 litres of water per person each year.

Writing on the federal Your Home website (**yourhome.gov.au**), McGee identifies two main ways households can reduce their impact:

- Reducing the quantity of water we use.
- Improving water quality by managing stormwater and wastewater.

Using less mains water will save you money and ease pressure on a limited resource.

There is also a legislative imperative for more sustainable use of water. In NSW, the Building Sustainability Index (BASIX) aims to reduce the mains water consumption of all new residential developments. Locally, Randwick City Council's Rainwater Tank Policy requires all new developments (residential, commercial and industrial) to consider installation of a rainwater tank.

Rainwater capture

It's such a waste not to capture some of the water that falls when it rains. A properly installed rainwater tank can save up to 40 per cent of your drinking water supply, saving you up to $200 a year, according to Sydney Water. A tank can also provide an alternative source of water for the garden during drought when water restrictions kick in.

Depending on the type of tank you install, and how the harvested rainwater is filtered and treated, the water can be used indoors, in the kitchen, laundry and bathroom, as well as outdoors. Even if you only use the water outside, Sydney Water figures show 23 per cent of the water used in an average home is used to water lawns and garden beds.

Capturing rainwater can be as simple as putting a bucket under a downpipe or as complex as installing a fully automated system with multiple above- or below-ground tanks.

When deciding the best size for your tank consider:

- How the water is going to be used.
- The average amount of water consumed by these uses - available from your water supplier or try the calculator on the Hunter Water website **hunterwater.com.au**.
- Local rainfall: find the annual rainfall in your area on www.bom.gov.au. In areas with highly variable rainfall, much bigger tanks are required for the same supply of rainwater.
- Roof area: 1mm of rainfall on 1 sqm of roof area = 1L of rainwater.
- Desired security of supply: a larger tank volume leaves fewer periods without rainwater.

Of course, tank size will also be determined by how much space you have and how much you are able to spend. Some councils, including Randwick, Inner West and Ku-ring-gai councils in Sydney, offer rainwater tank rebates. In Randwick, rainwater tanks are regarded as exempt development but their installation still has to comply with relevant state and federal planning and environmental laws.

Greywater

Greywater includes water from the laundry and from the shower, bath and basin in the bathroom. Washing up and dishwasher water is not usually used because it contains fats and food scraps. According to Josh Byrne, environmental scientist and Gardening Australia presenter, in Australia the average person produces about 100 litres of greywater each day. 'A family of four could expect to produce around 400L per day, which is enough to irrigate 40-60 square metres of high water-use garden, or more if low water-use plants are used.'

Greywater can provide water when rain doesn't fall and the tanks are empty. It can be used in the garden, even on food crops and natives, as long you take some basic precautions.

The cheapest way to use greywater s to collect water in a bucket from the shower or washing machine and use it to water the garden. While there are advanced treatment systems that also allow greywater to be re-used indoors to wash cloths and flush toilets, 'direct diversion' systems are the most common.

In Randwick, council approval is not required for diversion devices if the device has WaterMark certification, but devices must be installed by a licensed plumber. The direct diversion system

uses driplines or slotted drains which are covered with mulch to avoid human contact with the greywater. Because of the risk that pathogenic organisms may still be present even after treatment it is recommended that greywater not be used to water herbs and ground-grown vegetables, especially those that are going to be eaten raw. Greywater can be used to irrigate fruit trees and other edibles as long as there is no contact with the part of the plant that is going to be eaten.

As a general rule, use bleach-free cleaning products and low- or no-sodium and phosphate-free soaps, shampoos and detergents. Choice magazine recommends against using the wash water from front-loading washing machines because it tends to have a high concentration of detergent. Even the best GreySmart cleaning products tend to be alkaline, which can affect soil pH and cause some plants, especially natives, to develop nutrient deficiencies. To avoid this, give the garden a periodic rest from greywater. Monitor soil – test the pH and check for worms and other organisms – and add organic matter to improve soil health and nutrient availability.

Inside and outside

Installing water-efficient washing machines and dishwashers as well as low-water-use taps and shower heads can dramatically reduce domestic water use. In the same way as the national Energy Rating system enables appliances to be compared on the basis of energy use, the Water Efficiency Labelling System (WELS) allows fixtures and appliances to be compared on the basis of water usage. Just as the Energy Rating system provides specific information on the energy usage of each appliance, WELS provides information on typical water usage. The performance of toilets is measured in litres per flush, while washing machines and dishwashers are measured in litres per wash and taps and shower heads in litres per minute. Saving water is also about modifying behaviour. Sydney Water offers the following tips for saving water in the home:

- Keep showers to four minutes. Taking shorter showers is one of the best ways to help save water.
- Wait until the dishwasher or washing machine is fully loaded before you turn it on.
- Turn off the tap while you brush your teeth or shave.
- Wash vegetables and rinse dishes in a plugged sink or basin – not under a running tap.
- Fix any leaks.

How the nursery is minimising water use

The nursery is committed to minimising water use, in line with community expectations. Our minimisation strategies include:

- In times of rain, on-site collection and storage tanks with a capacity of more than 100,000 litres capture this resource before it is lost as stormwater.
- At times of low rainfall, approximately 70 per cent of irrigation water is drawn from a bore supply.
- Excess water from daily irrigation is collected, filtered and UV-treated for re-use.
- Where mains water is needed for supplementary irrigation, we minimise this as much as possible. The water then flows through to our recycling system, ensuring multiple use.
- Our systems are continually monitored to ensure efficiency and identify areas that can be improved.
- The nursery propagates, grows and promotes the use of hardy low-water-need plants that are suitable for local conditions and soil types.
- Use of a specially formulated potting mix designed to hold water and also containing wetting agents to keep water use to a minimum.

Under Sydney Water's WaterFix® program, you can arrange for a plumber to check your home for leaking taps and fittings and suggest water-efficient devices for a $33 call-out fee. Randwick offers a rebate of $100 under its Community Sustainable program for WaterFix® installations and repairs in houses and units.

In the garden

- Use a broom or rake rather than a hose to clean driveways and other hard surfaces.
- Plant for the climate and soil in your area.
- Apply 7-10cm of mulch around plants to help reduce evaporation.
- Get rid of weeds - they take water away from the plants you want to grow.
- Group plants with similar needs so they all get the right amount of water without wasting any.

Reducing stormwater

Managing surface run-off and stormwater pollution helps to prevent the degradation of creeks, rivers, wetlands and oceans.

Rainwater capture in water tanks is just one way to reduce stormwater flows.

Replacing concrete and asphalt driveways, paths and patios with porous or water-permeable paving, or with permeable materials such as gravel, is a great way to slow stormwater runoff. Some councils offer rebates for the installation of permeable paving. Another benefit is a reduction in the heat island effect of materials such as concrete.

Reduce water loss, including stormwater run-off, from a steeply sloping site by creating terraces or by using grasses and other planting to slow water flow. The plants will also reduce the loss of topsoil and help water penetrate the soil.

In the right location, you can install a raingarden or swale to slow and filter stormwater.

References:

The Sustainable House Handbook, Josh Byrne, Hardy Grant Books, 2020, Richmond, Victoria.

Useful websites:

choice.com.au/home-improvement/water/saving-water

yourhome.gov.au/water

sydneywater.com.au

Living Wetlands of Randwick

Freshwater swamps and wetlands provide important ecosystem functions: groundwater re-charge zones, a natural filter to pollutants and habitat for terrestrial and aquatic fauna. They are also a critical element in the life cycle of invertebrates, such as dragonflies.

The suite of species that inhabit a swamp or wetland are a sound indicator of the health or condition of the site. For example, frogs are known for being particularly sensitive to water pollutants, so will only inhabitant areas with good water quality.

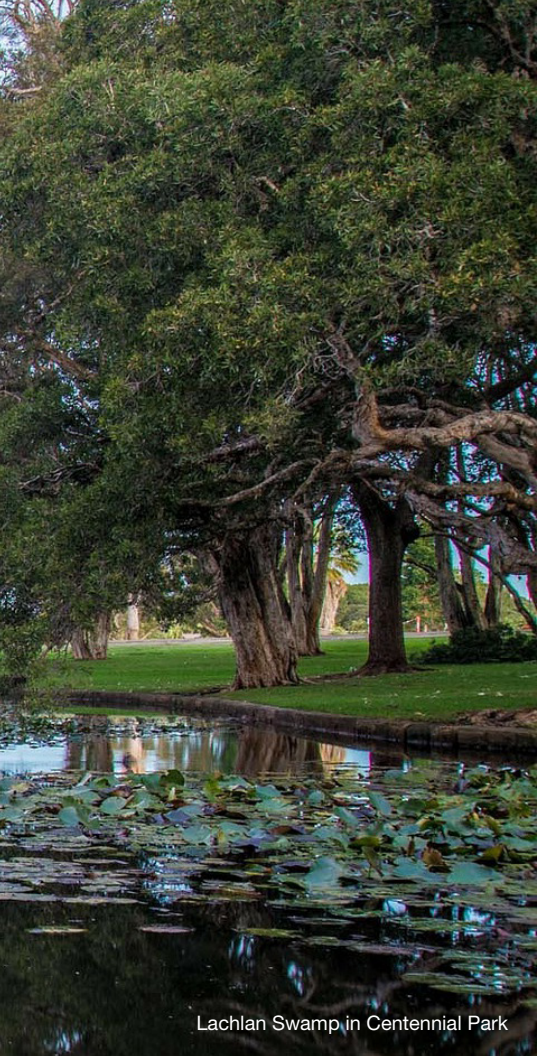
Malabar Wetland

Malabar Wetland, alternatively known as Lake Malabar, is located west of the foot of the ridge extending through western Malabar Headland National Park, just north of Pioneers Park. This wetland is considered a 'Sydney freshwater wetland of the Sydney Basin Bioregion' and is an important habitat for a thriving population of frogs which support larger predators such as blue tongues, birds and red-bellied snakes. With such heavy alterations to the surrounding lands over many years, it is unclear what the precise history of this lake is. Viewing historic mapping of the area from 1875, it seems plausible that Malabar Lake was used to drain some of the water from the wider landscape as many larger waterways were removed from the landscape.

Randwick Environment Park

These wetlands are ephemeral wetlands, which means they only hold water during wetter weather. Dry periods for an ephemeral wetland are completely normal – in fact this wetland is dry up to 85% of the time. The water in the wetland constantly seeps through the sandy soil and into the water table under the earth. It drains to the south-west and replenishes the Botany aquifer. The Botany aquifer is a large volume of underground water, which runs from Centennial Park to the Botany Wetlands and into Botany Bay.

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, which were put in place. 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 which we regularly empty. The Henning Street outlet includes a man-made creek with a rock-lined riparian zone (the area between land and a river or stream),



Lachlan Swamp in Centennial Park

and vegetation on each bank, slowing the water and preventing soil erosion.

The Randwick Environment Park was originally part of the Randwick Army Barracks and was established in 2010. It encompasses 13 hectares of parkland, bushland and wetlands. The bushland and wetlands provide a valuable habitat for native birds, lizards, frogs and mammals. In fact, more than 90 species of indigenous plants have been identified within the park to date. It contains 3.6 hectares of Eastern Suburbs Banksia Scrub, a critically endangered ecological community. The bushland is also open to the endangered Sunshine Wattle.

Lachlan Swamp to Botany Wetland

Lachlan Swamp refers to the collection of wetlands now largely contained within Centennial Park. Centennial Park is one of the State's most highly valued open space areas, with significant recreational, cultural, heritage and conservation importance. Despite this, there have been ongoing concerns about degradation of the water quality in the ponds here, due to nutrient enriched stormwater, sediments, gross pollutants as well as oil and chemical spills. But there is more to these swamplands than meets the eye.

The Botany Sands lie beneath much of western Randwick and most of Botany, forming a large and high-permeability aquifer. This single system connects surface waters at Lachlan Swamp in Centennial Park, to Botany Wetlands east of the airport, before eventually emptying into Botany Bay. The composition of these sediments is largely made up sandy soils and peat, which act like a sponge, retaining water for many months following heavy rainfall (*Butler 2011*). The water in this aquifer flows south-west at speeds of the order of one or two meters a year under normal hydraulic pressures. The ground water depths below surface range from zero in Botany Wetlands, increasing to the north and east, with a maximum depth of about 23 metres near Centennial Park. These integrated ground and surface water systems are extremely important as they can mitigate floods by drawing excess water below ground during periods of high rainfall. Conversely, when surface waters dry up, underlying groundwater discharges water into surface systems.

The water quality of this catchment has substantially affected the vegetation and fauna populations of the wetlands. Botany Wetlands were once thought to be wastelands, with water remaining affected by mistreatment over many years. The larger ponds remain impacted by contaminants and are heavily infested with two introduced fish species (Carp and Gambusia or Mosquito Fish), each damaging in different ways. Despite this historic mistreatment, long term remediation works by Sydney water continue to enhance the ecosystem value of these important wetlands. Part of this land now holds some of the most significant patches of Eastern Suburbs Banksia Scrub outside of the Randwick LGA.

Trenerry Reserve Peat Swamp

A remnant peat bog, the last of its kind in Randwick City, occurs at Trenerry Reserve in Coogee. Like some other coastal swamps in the region, the surface water occurs here because the soil profile narrows, and groundwater cannot penetrate the underlying sandstone. The peat layer overlying sandstone acts as a sponge to lock up water, enabling it to stay moist even in times of drought. In these conditions water percolates laterally through soil or runs freely as overland flow. The reliably moist conditions provide essential habitat to a rich diversity of sedge and rush species such as *Baumea juncea, B. acuta, Cyperus polystachyos, Juncus planifolius* and *Schoenus apogon* to name just a few. These plants help provide the food and shelter used by a range of fish, frogs, reptiles and birds.

Coastal Wetlands, such as Trenerry Reserve provide essential, reliable habitat for birds such as this White-faced Heron (*Egretta novaehollandiae*) (*Source: Mark Bond*)

Working bee calendar

BUSHCARE

GROUP	LOCATION	DAY	TIME	MAR	APR	MAY
Clovelly Bay	Opposite 18 Eastbourne Ave, Clovelly	Friday	9am-11am	12	9	14
Dunningham Reserve	Adjacent 5-7 Major Street, Coogee	Thursday	9am-11am	25	22	27
Fred Hollow's Reserve	Bligh Place entrance, Randwick	Wednesday	9am-12pm	10	14	12
Gordon's Bay	Access via UNSW Cliffbrook Campus Grounds, 45 Beach St, Coogee	Sunday	9am-1pm	7	Easter – No Bushcare	2
Grant Reserve	Coogee Surf Life Saving Club carpark (south of the beach)	Wednesday	8am-10am	17	21	19
Ladies Pool (Ladies Only)	At the entrance to the Ladies Pool, McIver's Rock Baths, Coogee	Thursday	8am-11am	18	15	20
Malabar Wetland	End of Manwaring Avenue, Maroubra	Wednesday	1pm-4pm	17	21	19
Malabar Foreshore	Opposite 9 Bay Parade, Malabar (near Malabar Ocean Pool)	Saturday	8am-12pm	6	Easter – No Bushcare	1
Maroubra Dunes	The South Maroubra SLSC car park	Thursday	9am-1pm	4	1	6
Prince Henry	Alternate between opposite 2 Millard Dr & the corner of Jennifer & Harvey St, Little Bay	Saturday	9am-1pm	13	10	8
Randwick Environment Park	Access via corner of Dooligah Avenue and Burragulung Street, Randwick. Works take place within fenced area on the far side of the oval.	Wednesday and Sunday	9am-12pm	3 & 14	7 & 11	5 & 9
Wylies Baths	BBQ area opposite the entrance to Wylie's Pool, near Neptune Street, Coogee	Tuesday	9am-11am	9 & 23	13 & 27	11 & 25
Little Bay Landcare*	Meet between 119 and 121 Bilga Cresent, Malabar. Contact Kerry Gordon on (02) 9311 4099.	Saturday	8am-12pm	6	3	1
Magic Point (Malabar Headland)*	Contact Claire Bettington on (02) 9344 8589 for the meeting place.	Thursday	9am-1pm	11, 18 & 25	8, 15 & 22	13, 20 & 27
Malabar Headland West*	Contact Therese Weiss on (02) 9311 2652 for the meeting place.	Sunday	9am-1pm	7, 14, 21 & 28	4, 11, 18 & 25	2, 9, 16, 23 & 30

* Denotes non-council run groups. Please contact organisers directly.

PARKCARE

GROUP	LOCATION	DAY	TIME	MAR	APR	MAY
Alison Road	Corner of Alison Road and Beach Street, Coogee	Wednesday	8am-10am	24	28	26
Clyde Street	Reserve opposite 15 Clyde Street, Randwick	Saturday	1pm-3pm	6	Easter – No Bushcare	1
Old Tramline	Adjacent 284R Carrington Road, Randwick	Thursday	8am-10am	11	8	13

Randwick City Council
a sense of community

Bushland Management Unit
192 Storey Street
Maroubra NSW 2035
bushcare@randwick.nsw.gov.au
Supervisor Bushland 9093 6683
Bushland Officer 9093 6687/6708

Community Nursery
2B Barker Street
Kingsford NSW 2031
9093 6250
Opening hours
Monday to Friday | 9am-3pm