




**CITY OF
PARRAMATTA**



Lake Parramatta Reserve

Nature in our city



City
of Parramatta
Council respectfully
recognises the Dharug people
who are the traditional custodians of
the land of Parramatta.

We acknowledge that Aboriginal and Torres Strait Islander people continue to play a vital role in the ecological, economic, social and cultural life of Parramatta, while maintaining a distinct culture built on the principals of Caring for Country, the primacy of family, and the dignity and governance of Elders.

Sydney red gum,
Angophora costata
can be recognised
by its distinctive
salmon-pink colour,
curving branches,
and shedding bark.
Image: CoP.

Content and design: Virginia Bear,
unless otherwise credited.

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Lake Parramatta Reserve stats

Location 2.2 km north of Parramatta's central business district.

Size 73 hectares, including approximately 10.5 hectares of water surface.

Mean daily maximum temperature range 17°C to 28°C (summer).

Mean minimum daily temperature range 6.1°C to 17.7°C (winter).

Rainfall Somewhat seasonal, with wetter summers and drier winters. Mean annual rainfall is 935 mm.

Ownership Crown land under the care, control and management of Parramatta City Council, the Reserve Trustee.

The sugar glider has managed to survive in Lake Parramatta Reserve despite the challenges in this much-changed habitat. It depends on hollows in dead and live trees.
Image: H. Matthews OEH.

This booklet describes Lake Parramatta Reserve from the point of view of its natural assets: its native plants, animals and landscapes.

It's for visitors, students, residents, and any one interested in the reserve, to help us better understand, enjoy, and care for this natural treasure.



Introduction

Here is an island of nature, much as it has been for many thousands of years – except that now it's within an urban landscape, on the doorstep of a vibrant and growing city.

Lake Parramatta Reserve is highly valued by the local community as a place for recreation, a peaceful escape, and a connection with the natural world. Its natural values are in relatively good condition, and many bush plants and animals rely on it for their survival. It holds significant reminders of our region's Aboriginal and non-Aboriginal heritage.

Now vulnerable in this much-changed environment, and in demand from growing numbers of visitors, the reserve will need careful ongoing management so we can continue to enjoy all that makes it special.

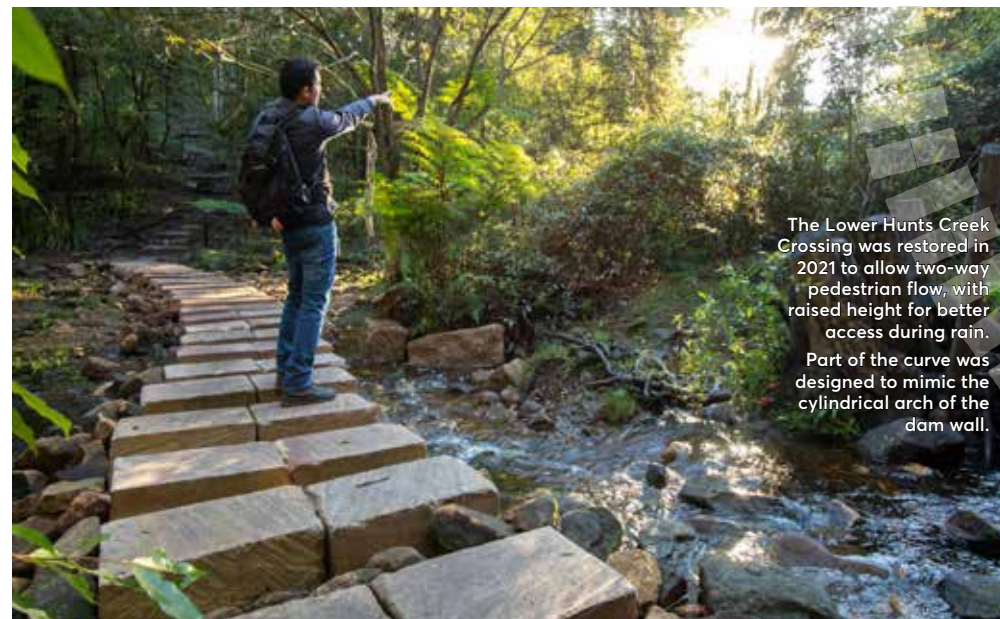
Lake Parramatta Reserve is one of the most significant bushland remnants in Western Sydney, and the largest in the City of Parramatta, where it has the highest diversity of native flora and fauna, and is classified as a core biodiversity area.

Aboriginal people have been living in, and visiting the Parramatta area for around 60 000 years. What is now Lake Parramatta Reserve was part of vast expanse of varied natural landscapes that provided all life's necessities.

Here it is possible to imagine what life would have been like. Though much has changed, many of the resources (plants animals and landscape features) that supported traditional life are still here, along with rock art and artifacts.

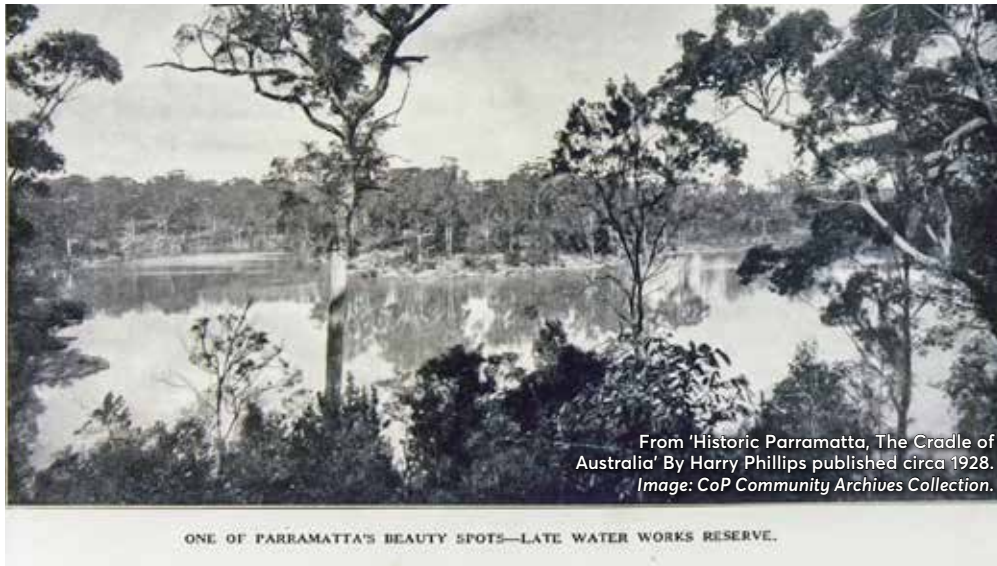
There were changes over this long time – changes in climate, landforms (particularly coastal landforms affected by sea level rise) and the plants and animals. No doubt there were also cultural changes, and changes in the way the local resources were used. But they were gradual compared with the changes of the last 250 years.

The greatest change is still playing out. European settlement brought a sudden and severe disruption to traditional Aboriginal lifestyles, along with the removal of much of the regions bushland, and the introduction of new species. And now we are starting see the effects of a changing climate.



The Lower Hunts Creek Crossing was restored in 2021 to allow two-way pedestrian flow, with raised height for better access during rain.

Part of the curve was designed to mimic the cylindrical arch of the dam wall.



The bushland that is now Lake Parramatta Reserve was initially preserved as a protective buffer around the dam, when it was Parramatta's main water source. After 1909, once the dam was no longer needed, sale and subdivision for urban development was a tempting option for the water authority. But others advocated for its recreational and conservation value, and in 1927 most of the bushland became a recreation reserve.

A century ago Lake Parramatta was popular for swimming, rowing, water skiing and picnicking, but urban development in the catchment put an end to the clean water. People started using the reserve as an illegal rubbish tip. Bushrock was stolen, cars and trail bikes disturbed the plants, animals and the fragile soil.

Over thousands of years Aboriginal people had cared for and managed these natural landscapes sustainably. Now, without restoration as well as ongoing care and management, the reserve faces an uncertain future of overuse, weed infestation, species extinction, and water pollution.

But we know how to fix most of these problems.

In the last few decades efforts to clean up the catchment allowed the lake to be reopened for swimming (in 2015). Many severely weed infested areas are being bought back to health using bush regeneration techniques.

Lake Parramatta is popular again, and visitor numbers are higher than ever.

For many familiar bush plants and animals, the reserve is home – and vital for their survival. And there is more to the story that we can't see. Places like Lake Parramatta, where much of the complexity of nature has remained intact, hold a treasure trove of genetic diversity within their plants, animals, fungi and microorganisms. They may yield valuable products and services such as medicines or new biotechnologies that humans come to rely on.

We can't recover all the biodiversity the reserve once had, but if we take good care of the it, the health of its natural assets will continue to improve. Human health can improve too, because we benefit greatly from access to natural spaces, and from knowing that the living things unique to our local area will be there for future generations to enjoy.



City of Parramatta's vision for biodiversity

'Parramatta is recognised as a city with unique natural assets, places where people can experience nature, and our community can feel confident that we have secured the integrity and function of our unique bushland areas now and into the future, to ensure our city and people prosper in a healthy landscape'.

*'Life in Our City'
Parramatta Biodiversity
Strategy 2015-2025.*

Place in the landscape

Parramatta is within the Sydney Basin Bioregion: one of Australia's 404 distinct landscape zones.

Part of Hunts Creek Catchment

The ridgelines along Pennant Hills Rd and North Rocks Rd form the boundaries of the Hunts Creek catchment. All the stormwater drains in this area discharge into Hunts Creek.

Bidjigal Reserve

Hills Motorway M2

North Rocks Road

Seville Reserve

Hunts Creek Reserve

The Kings School

Pennant Hills Road A28

Lake Parramatta Reserve

Pennant Hills Park

HORNSEY PLATEAU

CUMBERLAND LOWLANDS

James Ruse Drive A40

An island of nature in a sea of suburbia

Lake Parramatta Reserve is one of the many patches of bush that make up Sydney's extraordinary natural landscape. It forms part of a network providing a range of different habitat types.

Unusually for a major city, Sydney has retained large natural areas (National Parks, State Forests and in private ownership) to the south, west and north – along with a series of bush islands and fingers reaching into urban areas. This bush network filters our air and water, provides unique recreational opportunities, and supports the wildlife (such as parrots, kookaburras, possums, butterflies, and frogs) so familiar to Sydneysiders.

Lake Parramatta Reserve forms the southern part of a bush corridor along Hunts Creek, and is linked to Hunts Creek Reserve and Seville Reserve through a significant bushland remnant owned by The Kings School.

There are other, large bush patches, such as Bidjigal Reserve and Pennant Hills Park, within a few kilometers.

Some of the more mobile animals, such as parrots and bats, can make use of the wider, regional habitat by moving between these patches. Backyards with native trees, grasses and shrubs can also form an important part of the habitat network.

For the growing number of people inhabiting the surrounding sea of city and suburbs, these shrinking islands of nature are increasingly important for our wellbeing.

On the boundary between plateau and plain

Lake Parramatta is at the southwest edge of the **Hornsby plateau**: a vast network of sandstone ridges and gullies, some capped with shale, extending from Sydney Harbour to the Hunter Valley. The shale (now mostly cleared of vegetation) once supported tall Blue Gum High Forest, or (on drier sites like Lake Parramatta) Sydney Turpentine-Ironbark Forest. The remnants of both these communities are now recognised as endangered. The sandstone bushland is more common, often protected in rugged gullies that were never cleared, such as Bidjigal Reserve and Pennant Hills Park.

To the southwest are the undulating to low hills of the shale-based **Cumberland Lowlands**, where the small amount of remaining bushland is all classed as endangered.

To the southeast the **harbour foreshores** extend along the Parramatta River to the sea.

Parramatta River

HARBOUR FORESHORES

Image: Google Maps

Lake Parramatta Reserve

Geology and soils

Hawkesbury Sandstone is prone to cavernous weathering, forming overhangs and caves. Some are big enough for groups of people to shelter in.

The coral fungus is the fruiting body of a large underground network of thread-like mycelium.



Soils are complex living systems

Soils can develop when rock materials combine with a vast diversity of life forms (mostly tiny microbes, fungi, and invertebrates) and dead organic material (e.g. leaf litter), and these all interact to form an ecosystem.

The biological parts of the soil are essential for supplying nutrients, and building and maintaining structures that hold air and water.

Local sandstone soils are particularly low in phosphorus, and plants rely heavily on biological processes to get essential nutrients.

Geology drives much of the reserve's character – shaping the landform and soils. Sandstone dominates, but higher areas include the transition to the overlying shale.

Blanketing most of the rock is the thin layer where plants, animals, fungi, bacteria and other small organisms combine with water, air and minerals to form soils. Soils are complex systems that support, shape and interact with the life we see above them.

Hawkesbury Sandstone

Throughout the greater Sydney area, sandstone landscapes dominate our natural areas: they were unsuitable for farming, and too rugged for easy development, so sandstone bushland types are still common.

Soils formed on Hawkesbury Sandstone are generally shallow, very low in nutrients (particularly nitrogen and phosphorus), acidic, dry out quickly, and are highly erodible. And the local plants have had time to become perfectly adapted to them.

The sandstone is made mostly of medium to coarse (0.5 to 1 mm) quartz grains. Occasional layers or lenses of finer material (shale/mudstone and siltstone) occur, particularly near the formation's top, such as at Lake Parramatta.

These materials were deposited in the middle Triassic (around 235 million years ago) by a large braided river system, as sedimentary layers of different thickness and hardness.

Clay, iron and silica compounds cemented them. Later, regional tectonic forces created near vertical fracture lines.

Over millennia, streams cut through to form deep, rugged gullies. Erosion along planes of weakness gives rise to characteristic sheer cliffs, and tendency to break into blocks.

Sandstone-based soil landscapes:

Gymea (Australian soil classification: tenosol). On undulating to rolling low hills, 10 to 25% gradient. Shallow to moderately deep (30-100 cm). Rock outcrops <25%.



Hawkesbury (Australian soil classification: rudosol). On rolling to very steep hills, >25% gradient. Shallow (>50 cm) and discontinuous. Rock outcrops frequent (>50%).



Hawkesbury Sandstone features

Prone to cavernous weathering – often forming overhangs and shallow caves.

Good hardness for sharpening tools by grinding – or milling seeds to make flour.

Soft enough to be quarried easily, but hard enough to form durable building stone. Examples in the reserve include the dam wall, 'improvements' from the 1930s (roads, garden edges etc), and the Lower Hunts Creek Crossing built in 2021.

Softer layers can weather away creating, flattish, smooth often large surfaces. This allowed Aboriginal people to create an extraordinary and extensive gallery of rock engravings.

Many types of fauna habitat. Crevices, outcrops, slabs, rock piles etc, offer a wide range of choices. Some animals (flat-tailed geckos) have evolved specifically to use them.

Orange-red banding, when iron compounds found in sandstone oxidise (rust).

Mittagong Formation

A relatively thin layer of interbedded shale and quartz sandstone, between the Ashfield Shale and Hawkesbury Sandstone, and sometimes intergrading with them. It's rarely seen outcropping. It supports plant communities that have restricted distribution: Coastal Shale-Sandstone Forest, and Sydney Turpentine-Ironbark Forest.

Associated soil landscape: Lucas Heights (Australian soil classification: kurasol). On gently undulating crests and ridges with gradients less than 10%. Shallow (<100 cm). Low fertility and water holding capacity, but not quite as low as sandstone soils.



Ashfield Shale

A formation of the Wianamatta group, made up of fine-grained black mudstones (non-layered), grey shales (in layers), and ironstone bands. It was deposited as the river system slowed, and the sediment load became finer. It underlies the highest parts of the Hunts Creek Corridor, almost entirely above the reserve boundary, but is a source of phosphorous and clay that enriches the sandy soils below, and improves their water holding capacity. It is too soft to outcrop, so is only seen in cuttings. Around Lake Parramatta, it supports Sydney Turpentine-Ironbark Forest.

Associated soil landscapes (above the reserve boundary)

Glenorie (Australian soil classification: dermosol). On low rolling and steep hills with slopes of 5 to 20%. Shallow (<100 cm) to deep (>200 cm). Low to moderate fertility.

Blacktown (Australian soil classification: kurasol). On gently undulating slopes (<5% to 10%). Shallow (<100 cm) to moderately deep (>100 cm). Low to moderate fertility.



Stylised cross section

Across the southeast section of Lake Parramatta Reserve (A to B), showing the relationship of rock units, soil landscapes, landform and ecological communities.



Ecological communities

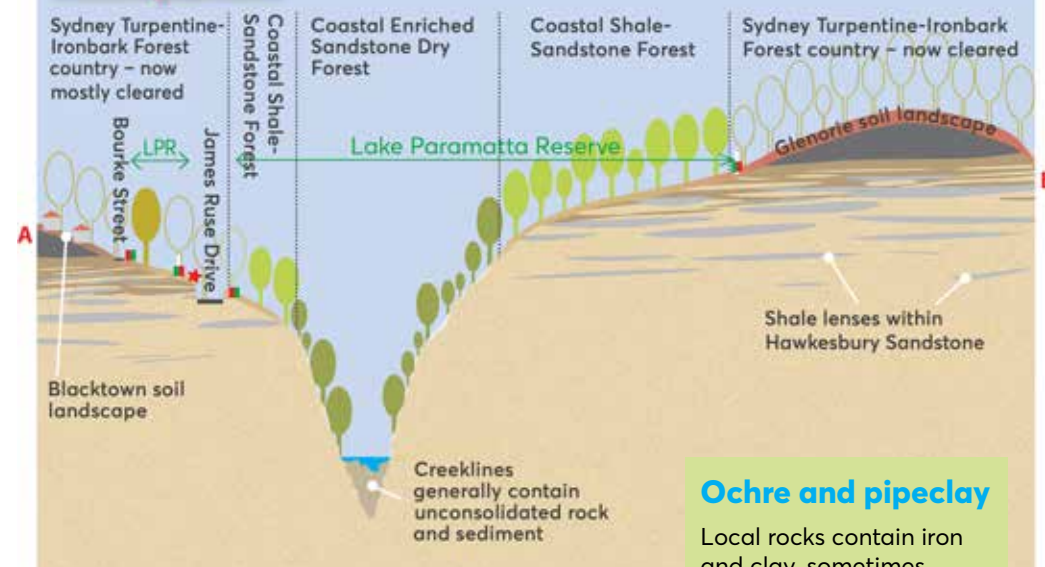
- Sydney Turpentine-Ironbark Forest
- Coastal Shale-Sandstone Forest
- Coastal Enriched Sandstone Dry Forest

Soil landscapes

- Glenorie (shale based)
- Blacktown (shale based)
- Lucas Heights (Mittagong Formation based)
- Gymea (sandstone based)

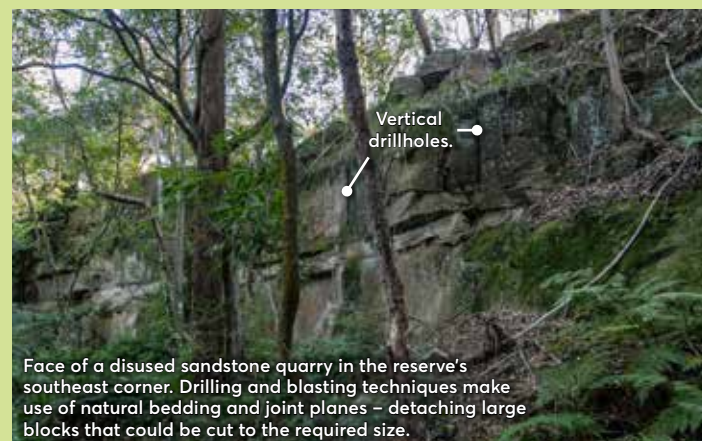
Rock units

- Ashfield Shale
- Mittagong Formation
- Hawkesbury Sandstone



Ochre and pipeclay

Local rocks contain iron and clay, sometimes forming deposits of red or yellow ochre, or bleached white 'pipeclay' – significant resources for Aboriginal people.



★ Cutting on James Ruse Drive, exposing the gradual transition from Hawkesbury Sandstone (mainly thicker layers of golden-brown, sand-sized material) to the Mittagong Formation higher up (including thinner layers of darker, fine-grained material).



Water

Striped marsh-frog tadpoles.

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How can people in the catchment help keep Lake Parramatta clean?

Don't let soap enter stormwater drains when you wash your car. Wash it on the grass, or use a water-recycling car wash facility. Phosphates from detergents encourage algal growth.

Don't flush chemicals or paint into stormwater drains. They end up in the bushland or the Lake.

Prevent leaves and grass clippings from washing down the drain. Green waste can cause algal blooms if it reaches the waterways. Compost garden waste and use it to improve garden soil.

If you use garden fertilisers and chemicals, make sure they stay in your garden. Could you use less? or use more environmentally friendly options?

Dispose of rubbish carefully. Including cigarette butts – they don't compost away.

Clean up after your dog. Animal waste promotes harmful bacteria in the water.

Parramatta gets its name from the Dharug word Burramatta, meaning 'where eels lie down'.
Image: Lochman Transaparencies.



Lake Parramatta's waterways are a drawcard for visitors. They provide recreation opportunities and scenic views, and many people find that being near water reduces stress. They are also part of ecosystems supporting wide array of native species.

Hunts Creek is the main waterway flowing through the reserve. Various unnamed creeks also flow in, including one from The Kings School, and one forming the southeast arm of the lake. After the dam was built in 1856, Hunts Creek rose and flooded part of the valley to form Lake Parramatta. The dam wall is 15 metres high, though the lake is shallower because most of the sediment that the creeks carry in is now trapped in the lake.



Hunts Creek above the dam.



Hunts Creek in flood.



Fresh sediment in Hunts Creek after heavy rain.

When most of the catchment changed from bushland to urban, the character and flow patterns of the creeks changed too. Rain hits hard surfaces instead of absorbent soil, and flows rapidly to the creeks, causing more frequent and powerful floods. Pools and swampy areas became incised channels. Inflowing pollutants made the water unsafe to drink. Until recently it was also unsafe for swimming, but by 2015, strategic management efforts had paid off with a swimmable lake – though pollution incidents and heavy rain remain a threat.



Hunts Creek first appears on the corner of Parkland Rd and Jenkins Rd at Carlingford, where it emerges from a stormwater drain.

It leaves the reserve through another engineered landscape, under James Ruse Drive.





Aquatic habitat

Dead plant material, from tiny fragments to large fallen trees, serves as habitat and food.

Aquatic species are those that live in freshwater for all of their life (e.g. fish) or part of it (e.g. dragonflies with their aquatic larvae). They rely on resources such as:

- submerged timber in various sizes and stages of decay
- rock arrangements with lots of crevices and hiding places
- various underwater surfaces such as bedrock, gravel, sand and mud
- perching or basking sites such as rocks and timber above the water
- the many different plants in and near the water.

The surrounding bush is an important part of the aquatic ecosystem, fringing vegetation in particular is used by many aquatic species. It also acts as a water filter. The original reason for retaining bushland around Lake Parramatta was to keep Parramatta's water supply clean.



Eel-tailed catfish can grow to 90 cm. The male builds a mound-shaped nest by pushing gravel, pebbles or woody debris together.
Image: Lochman Transparencies.



Pacific black duck.

Eurasian coot.

Hardhead.

Little black cormorant.

Fallen timber, above and below water, is used by many animals. Dense stands of waterplants offer a safe refuge.

Life in and around the water

Birds are surprisingly diverse for an urban park, and include residents such as swamp hens, and visitors such as spoonbills.

Reptiles Eastern long-necked turtles can sometimes be seen sunning themselves on a log in the lake. The eastern water dragons that are common around the reserve are semi-aquatic.

Frogs may live away from water, but require water (or wet places) or to breed.

Fish Four native fish have been recorded in the lake: Australian smelt, short-finned eel, firetailed gudgeon and eel-tailed catfish – along with introduced mosquito fish and carp. Australian bass are regularly stocked for fishing.

Macroinvertebrates (waterbugs) A myriad of insects, crustaceans, mites, molluscs and worms spend at least part of their lifecycle in water.

Microinvertebrates (usually less than 2 mm long) such as rotifers, ostracods, copepods and cladocerans.

Macrophytes (aquatic plants) They might be floating or attached, above water or submerged.

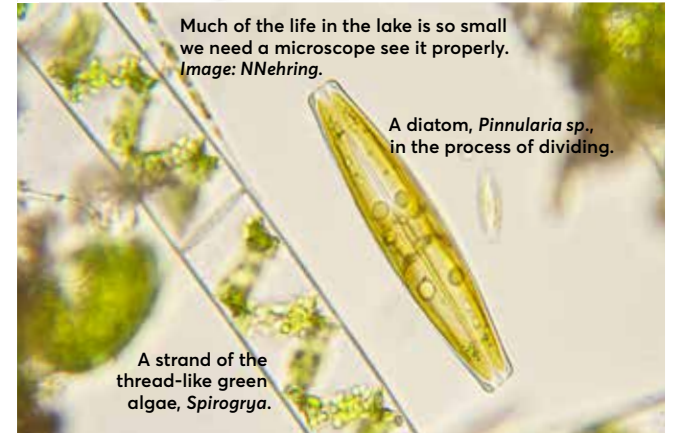
Algae This varied group include free-floating plankton such as diatoms, and attached cells or colonies. They form the base of freshwater food webs, and are important oxygen producers. They can also threaten water quality if aquatic systems get out of balance, such as blooms of Cyanobacteria if nutrients and temperatures get high enough.



A white-faced heron watches while a water skink makes a last-ditch attempt to escape from a great egret.



Eastern long-necked turtles survive in the reserve but it's not the safest habitat. They are often injured or killed crossing roads. Young turtles rarely reach adulthood, mainly because eggs and hatchlings are killed by foxes and crows.
Image: Tom Covell (still from video Connect with nature).



Much of the life in the lake is so small we need a microscope see it properly.
Image: NNeiring.

A diatom, *Pinnularia* sp., in the process of dividing.

A strand of the thread-like green algae, *Spirogyra*.

Living water quality indicators

Some freshwater species, like certain mayflies, are very sensitive to pollution. Others, like some segmented worms, can live in quite polluted water – so if they are all that survive, it's a bad sign.

Diatoms (a common type of microalgae) can show us a lot about the health of a waterway, because many species have particular habitat requirements.

Animals

Eight endangered animals use the corridor, including the grey-headed flying fox.

It's a 'keystone species' in the native ecosystems of Australia's east coast: crucial for long distance seed distribution and plant pollination.

But its numbers have dropped dramatically in recent years due to:

- loss of roosting and foraging sites through landclearing
- electrocution on powerlines
- entanglement in netting and barbed-wire
- heat stress
- conflict with humans, including illegal shooting and roost site disturbance.

Lake Parramatta Reserve is City of Parramatta's wildlife hot spot, with the highest diversity of animals living in or visiting its bushland and waterways.

Birds are the most obvious. A large flock of sulphur-crested cockatoos roosts here, and noisy miners and rainbow lorikeets are likely to be spotted on any visit. A range of waterbirds use the lake. And there is a variety of small birds – including some insect-eaters that often struggle in urban reserves.

Australia is known for its extraordinary diversity of reptiles, and the Hunts Creek corridor reflects this with 15 different species, from the lace monitor (reaching up to two metres in length), to tiny sunskinks.

Microbats are the most numerous mammals, with six species recorded, including three that are threatened (there could be more, because some bats are difficult or impossible to identify with the standard method of recording echolocation calls).

Five species of frogs survive, including the endangered red-crowned toadlet.

But it's the invertebrates (e.g. arthropods, molluscs, worms and a myriad of microscopic creatures) that make up most of the local animal diversity. They have not yet been surveyed, and when we look closely there might even be some new species.

Scientists have noticed insect numbers have been declining steeply across the world in recent years, due to habitat loss, climate change, and pesticide use. Even small patches of habitat such as backyards are important for insect survival, and larger refuges such as Lake Parramatta are vital.

Dragons are real here

These normally shy reptiles have become somewhat accustomed to humans at Lake Parramatta.

Active during warmer months, in winter they hide in burrows or under rocks and logs, and semi-hibernate.

Males grow to 80 or 90 cm long, and can develop red colouring on their chest and belly.

They can stay underwater for up to 30 minutes.

Image: Tom Covell (still from video Connect with nature).



Habitat assets

A relatively large area for an urban bushland remnant.

Trees with hollows

– essential for many animals but now in short supply around Sydney.

Fallen timber in various stages of decay.

Many different sandstone structures including outcrops, crevices, and layers of loose rock.

Lake and creeks provide water for birds to drink and bathe in, and a home for water bugs such as young dragonflies.

Variety of aquatic habitats

, such as shallow and deep water, with waterplants and submerged timber.

A variety of bush structures including thick, shrubby patches for small birds and nesting ringtailed possums, open, sunny areas for basking lizards, moist, ferny creeksides for frogs, and accumulations of leaf litter where birds might forage for insects.

Food is available from a range of native plants, that supply nectar, fruits and seeds at different times of the year.

Larger bushland patches and bush-friendly gardens close by. This wider habitat network is used by more mobile species

such as birds, possums, bats and insects.

Image: Ofer Levy.



Rare and intriguing: Dural woodland snail

They are found in just a few bush patches centered around north-west Sydney, on the interface between shale and sandstone soils.

We still have a lot to learn about them, including why they are so particular about their habitat.

During the day they shelter under rocks or inside curled-up bark, and venture out at night to eat fungi and lichen.

They are endangered due to habitat loss and fragmentation, loss of leaf litter, extensive or frequent fire, and trampling.

They don't travel far, and won't cross open ground – so roads and even foot tracks can trap them in small areas.



Eastern free-tailed bat
Image: N. Williams.

Now the reserve is part of an urban area, its animals face many new challenges

Some will probably survive because they can adapt to urban landscapes, or move between habitat areas, e.g. brush-tailed possum, eastern water-dragon, and galah (which could use distant nest hollows).

Some may soon disappear from the reserve due to lack of suitable habitat, and too many threats, e.g. jacky lizard, swamp wallaby, eastern long-necked turtle, golden-green carpenter bee.

Some may soon disappear all together. Seven of Lake Parramatta's animals are threatened with extinction. The Dural woodland snail is the most at risk. It spends its entire life within the reserve. The other threatened species are birds and bats which have the option of moving between bushland patches.

Some have already gone, but survive elsewhere, e.g. green tree frog, bearded dragon, common tree snake, wonga pigeon, bandicoot (which were present in 1990), antechinus, and yabbie.

Some have increased and are causing trouble e.g. noisy miners and pied currawongs, which can be aggressive and territorial and drive other birds away.

New invasive animals have arrived, e.g. foxes and cats are very effective predators that Australian animals have not evolved to deal with, European honeybees compete with native animals for nest hollows and nectar, mosquito fish eat frog eggs, and rabbits eat regenerating seedlings.

Multiple microbats

Sometimes seen in flight at dawn and dusk, these nocturnal mammals eat an extraordinary amount of insects each night (large-footed myotis will also catch small fish).

They roost in tree hollows and crevices, loose bark, caves, and sometimes buildings.



Eastern stone-gecko.
Image: Adobe stock.

Noisy miner: native troublemaker

This native honeyeater is increasing in urban landscapes. They enjoy 'park like' areas with lawns and scattered trees. They hang out in groups, and their territorial behaviour drives other birds – particularly small insect-eating birds.

Lake Parramatta's extensive bushland may be enough to keep the small birds safe. But we will need to keep a close watch on this aggressive local.

Surprising survivors

The Hunts Creek corridor has a few animals that, although not officially classed as threatened, are unusual in urban bushland.

They include the eastern stone gecko, rufous fantail, swamp wallaby and echidna.



Noisy minors nesting in sweet pittosporum.



Termite nest.

Hidden heroes: cellulose chomping termites

Along with bacteria and fungi, they power the 'brown food web': deconstructing the (normally indigestible) cellulose in plant material, and making it available to other species. Birds, bats, frogs, geckos, and ants, find termites a rich food source. The echidna is a specialised termite (and ant) feeder.

Termites avoid light, and are seldom seen (except for their breeding swarms), but they cooperate to build impressive and complex nests, on the ground or in trees, where they can maintain their preferred temperature and humidity. Termite nests provide shelter and nest sites for other species. Locally they are favoured by Kookaburras.

Spectacular bees to watch out for

At two centimetres long, the golden-green carpenter bee is one of Australia's largest bees – and one of the loudest. Listen for them from early spring to late autumn.

They cut nest burrows into soft wood such as grass tree stems or old banksias. They need some long-unburned bushland, with dead woody plants that have become soft enough for nest cutting. They also need more recently burned areas with regenerating plants (e.g. peas and other fire-adapted flowers) as a food source.

But their survival is not guaranteed. The golden-green carpenter bee became extinct across the entire state of Victoria after the 1939 bushfires, and were lost from many more areas in the 2020 bushfires.



Golden-green carpenter bee on pink wax-flower.

Plants

Many local native plants regenerate from seed after fire. Or sometimes, such as seen here, soil disturbance can be the trigger.

Flannel flower.

Pomax.

Wattle.



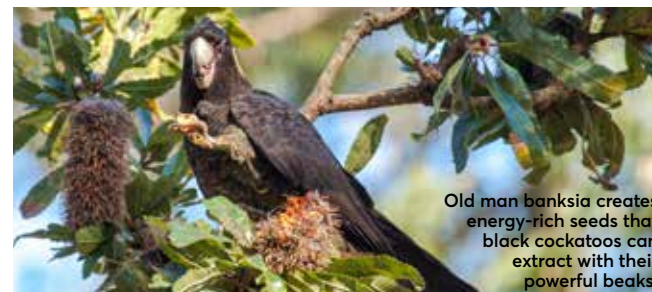
Non-local trees planted around the picnic areas include jacarandas from Brazil, and Illawarra flame trees, silky oak, brush box and fire wheel trees from other parts of Australia.

222 different native plants have been recorded recently in the reserve. They power the ecosystem by capturing energy from the sun, and making it available as food for animals, and they create structures and other resources for habitat.

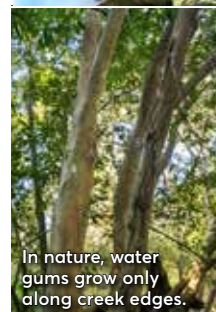
Like Australian plants in general, most have had millions of years of isolation to evolve into a great number of species (the Sydney region has around 20,000 different plants).

Over time the local plant species adapted to particular places in the landscape, and patterns of fire and weather, and formed associations with the life around them. Some are particular about where they grow, and can indicate a soil type or ecological community, while others have a wide range.

In the last 200 years, Parramatta's plants have been joined by many new species from other parts of Australia and around the world, including weeds that invade bushland and waterways. Problem weeds here include African love-grass, privet, lantana and wandering trad. They are capable of dominating and replace native ecosystems.



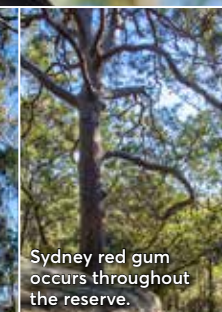
Old man banksia creates energy-rich seeds that black cockatoos can extract with their powerful beaks.



In nature, water gums grow only along creek edges.



Ironbarks indicate shale soils.



Sydney red gum occurs throughout the reserve.



It's all recycled. The fungi, lichens and mosses on this fallen sheoak trunk are part of a system that breaks down dead material, and releases its energy and nutrients for reuse.

Plant-like life



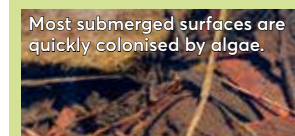
Earth star fungus fruiting body.

Fungi are neither plants or animals but essential to the survival of both. They form vast underground networks recycling nutrients and (along with legions of bacteria and other small organisms) interacting with plants in complex ways that we are only just beginning to understand.



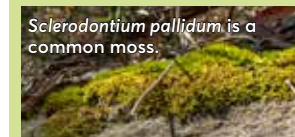
Mainly beard lichen, *Usnea*.

A **lichen** is an association between a fungus and an alga or cyanobacterium. Australia has more than 3000 types of lichens.



Most submerged surfaces are quickly colonised by algae.

Algae are most common in waterways. This group range from tiny plankton, to colonies forming mats, filaments or nets. Though sometimes dismissed as 'slime', algae are a vital part of aquatic ecosystems.



Sclerodontium pallidum is a common moss.

Mosses and liverworts (bryophytes) actually are plants, but they lack roots, and absorb water and nutrients directly through their surfaces.

Ecological Communities

(Types of bushland)

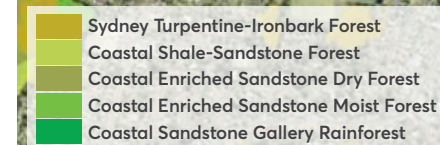
Australia's natural landscapes are made up of distinct ecological communities: particular groups of species that tend to occur together, in response to soil type, position in the landscape, and climate.

They blend into one another, and many species are shared, so the boundaries are rarely clear. Being dynamic systems, their appearance (e.g. the species mix, and the thickness of ground, shrub and canopy layers) will vary over time – particularly due to fire.

Much of the reserve's bushland is recovering from damage, such as logging, weed invasion – even complete clearing. Large old trees are rare.

Some communities, such as Sydney Turpentine-Ironbark Forest, have been cleared almost to extinction across their entire range, but remnants can still be found here.

Ecological communities



This map works best at a broader scale, so what you see on site might not match exactly. (Mapping in this area was largely based on soil landscapes, with limited field survey.)



A location of stylised cross section on page 10

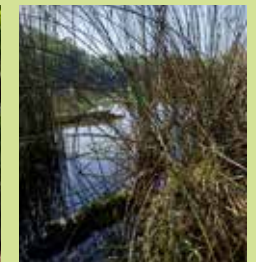
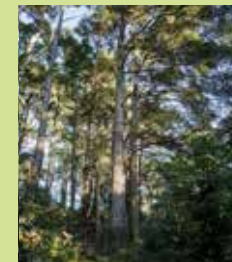
Bushland is often described in terms of its structure.

Lake Parramatta is mostly open forest, with trees up to 30 metres tall, and a medium-dense (30 to 70%) canopy.

Some exposed mid and lower slopes, have the more widely spaced trees, of a woodland (10 to 30% canopy cover).

Narrow patches of rainforest grow along some creek sections. The canopy is dense (70 to 100%).

Parts of the lake shore are fringed by wetlands (too small to show up on the map).



A forest for the future.

Sydney Turpentine-Ironbark Forest is a diverse tall open forest with trees up to 30 metres high, but at Lake Parramatta it is recovering from past disturbances such as clearing and logging. It might take 200 years to reach maturity again.

Fauna example

Bright copper butterfly

Relies on blackthorn as its only larval food plant.

Native Vegetation of the
Sydney Metropolitan Area
Classification

Sydney Turpentine-Ironbark Forest (STIF)

Structural Class Tall open forest.

Statewide Vegetation Class Northern Hinterland Wet Sclerophyll Forests.

NSW Plant Community Type Turpentine-Grey Ironbark Open Forest on Shale in the Sydney Basin (1281).

Includes some Turpentine-Ironbark Margin Forest.

The edge between habitat for people and nature. Planting and assisted natural regeneration are being used to reinstate STIF in this previously mown area.

Status Critically Endangered. Most has been cleared, and remaining patches are generally small and degraded. Scientists advise that it will soon cease to exist unless current threats are managed.

Associated threatened species Dural woodland snail.

In higher parts of the reserve, on shale or shale-enriched sandy soils.

Most has been damaged by logging, mowing, weeds, stormwater etc. The construction of James Ruse Drive in 1979 destroyed a large amount, and isolated the largest remaining patch from the rest of the reserve.

Trees 15-35 metres.

Shrub/small tree layer open with a mix of mesic (moisture-loving) and sclerophyll (heat and drought adapted) species.

Ground layer thick and diverse with many grasses and lilies.

Typical plants*

Trees turpentine *Syncarpia glomulifera*, Sydney red gum *Angophora costata*, blackbutt *Eucalyptus pilularis*, red mahogany *Eucalyptus resinifera*, grey Ironbark *Eucalyptus paniculata*.

Small trees sweet pittosporum *Pittosporum undulatum*, native olive *Notelaea longifolia*, elderberry panax *Polyscias sambucifolia*.

Shrubs bearded heath *Leucopogon juniperinus*, breynia *Breynia oblongifolia*, everlasting *Ozothamnus diosmifolius*, hop bush *Dodonaea triquetra*, hairy pittosporum *Pittosporum revolutum*, blackthorn *Bursaria spinosa*.

Vines and climbers wonga wonga vine *Pandorea pandorana*, appleberry *Billardiera scandens*, small-leaf glycine *Glycine microphylla*, love creeper *Glycine clandestina*, wombat berry *Eustrephus latifolius*.

Groundlayer blue flax lily *Dianella caerulea*, white root *Pratia purpurascens*, variable Sword-sedge *Lepidosperma laterale*, mat-rush *Lomandra longifolia*, kidney weed *Dichondra repens*, many-flowered mat-rush *Lomandra multiflora*, pastel flower *Pseuderanthemum variabile*, weeping rice grass *Microlaena stipoides*, kangaroo grass *Themeda australis*, threeawn speargrass *Aristida vagans*, tufted hedgehog grass *Echinopogon caespitosus*, bordered panic *Entolasia marginata*, wiry panic *Entolasia stricta*.

Many STIF remnants have lost their shrubs and ground layer.

Gorse bitter-pea is locally common.

STIF understorey species have been planted on the road embankment near the reserve entrance.

Fauna example



Dural woodland snail

Lake Parramatta is one of the last strongholds for this rare, fungi-eating snail, found on the interface between shale and sandstone soils.

Native Vegetation of the
Sydney Metropolitan Area
Classification

Coastal Shale-Sandstone Forest

Structural Class Tall open forest.

Statewide Vegetation Class Northern Hinterland Wet Sclerophyll Forests.

NSW Plant Community Type Coastal Shale-Sandstone Forest (1845).



Kangaroo grass is common in the ground layer.

Status not endangered (considered to be adequately protected in reserves) but significant because there is not much of it left and it supports threatened species.

Associated threatened species purple heath and Dural woodland snail.

Downslope of the Sydney Turpentine-Ironbark Forest, where sandstone and shale soils mix. Plants from sandy and clay soil communities grow together.

Trees 20 to 30 metres – varying between tall open forest and woodland.

Shrub layer typically fairly open.

Ground layer continuous, with a high diversity of grasses, rushes and herbs.

Typical plants*

Trees Sydney red gum *Angophora costata*, red bloodwood *Corymbia gummifera*, blackbutt *Eucalyptus pilularis*, red mahogany *Eucalyptus resinifera*.

Small trees black she-oak *Allocasuarina littoralis*, sweet pittosporum *Pittosporum undulatum*.

Shrubs crinkle bush *Lomatia silaifolia*, flax-leaved wattle *Acacia linifolia*, hairpin banksia *Banksia spinulosa*, large-leaved geebung *Persoonia levis*, hop bush *Dodonaea triquetra*, paperbark tea-tree *Leptospermum trinervium*.

Vines and climbers sarsparilla *Smilax glycyphylla*, appleberry *Billardiera scandens*, devils twine *Cassytha pubescens*.

Ground layer violet-leaved goodenia *Goodenia hederacea*, many-flowered mat-rush *Lomandra multiflora*, mat-rush *Lomandra longifolia*, fish bones *Lomandra obliqua*, blue flax lily *Dianella caerulea*, variable sword-sedge *Lepidosperma laterale*, thyme spurge *Phyllanthus hirtellus*, hairy xanthosia *Xanthosia pilosa*, dwarf trumpet *Brunoniella pumilio*, speargrass *Austrostipa pubescens*, blady grass *Imperata cylindrica*, weeping rice grass *Microlaena stipoides*, kangaroo grass *Themeda australis*, wiry panic *Entolasia stricta*, bracken *Pteridium esculentum*.



Many of the large trees were harvested for timber.



Purple heath: Lake Parramatta's one threatened plant species.



Higher parts of the heritage path pass through Coastal Shale-Sandstone Forest.

Fauna example

Reed bee

In a good season there is an abundance of flowering shrubs such as peas where it can gather pollen and nectar to feed its larvae.

Native Vegetation of the
Sydney Metropolitan Area
Classification

Coastal Enriched Sandstone Dry Forest

Structural Class tall open forest (at Lake Parramatta includes some woodland).
Statewide Vegetation Class Sydney Coastal Dry Sclerophyll Forests.
NSW Plant Community Type Coastal Enriched Sandstone Dry Forest (1776).



Characteristic diverse groundlayer regenerating after a fire.

Status not endangered – considered to be adequately protected in reserves.

On upper slopes and dry gullies, when soils are slightly moister and more fertile than in typical sandstone dry forest. This is due to clay introduced from the shale geology upslope – or from localised shale lenses.

Includes more grasses and mesic species, and fewer heath plants, compared to more widespread forms of sandstone dry forest. Sweet pittosporum can dominate in long-unburned areas.

Generally tall open forest, but some sections on lower slopes have the wider spaced trees of a woodland.

Trees 8 to 30 metres. Often a sparse layer of small trees.

Shrub layer sparse to medium density.

Ground layer usually thick and diverse with many grasses and herbs. Can include some ferns.

Typical plants*

Trees Sydney red gum *Angophora costata*, red bloodwood *Corymbia gummifera*, Sydney peppermint *Eucalyptus piperita*, blackbutt *Eucalyptus pilularis*, turpentine *Syncarpia glomulifera*.

Small trees black she-oak *Allocasuarina littoralis*, old man banksia *Banksia serrata*, blueberry ash *Elaeocarpus reticulatus*, sweet pittosporum *Pittosporum undulatum*, christmas bush *Ceratopetalum gummiferum*.

Shrubs prickly Moses *Acacia ulicifolia*, paperbark tea-tree *Leptospermum trinervium*, broad-leaved geebung *Persoonia levis*, sweet wattle *Acacia suaveolens*, crinkle bush *Lomatia silaifolia*, hop bush *Dodonaea triquetra*, hairpin banksia *Banksia spinulosa*.

Vines and climbers Sarsparilla *Smilax glyciphylla*, appleberry *Billardiera scandens*, devils twine *Cassytha pubescens*.

Ground layer blue flax lily *Dianella caerulea*, wiry panic *Entolasia stricta*, mat-rush *Lomandra longifolia*, bracken *Pteridium esculentum*, hairy xanthosia *Xanthosia pilosa*.



Western side of the lake



A dead paperbark tea-tree in a long unburned area.



Small trees like black she-oak are typical.

Native Vegetation of the
Sydney Metropolitan Area
Classification

Coastal Enriched Sandstone Moist Forest

Fauna example Brush turkey

Needs lots of leaf litter for mound building, plus dense vegetation at ground and shrub level so chicks can hide from predators.

Structural Class Tall open forest.
Statewide Vegetation Class North Coast Wet Sclerophyll Forests.
NSW Plant Community Type Coastal Enriched Sandstone Moist Forest (1841).



Near the Upper Hunts Creek Crossing.

Status not endangered – considered to be adequately protected in reserves.

On south facing gullies, or lower slopes with deeper soils.

Occurs when soils are slightly moister and more fertile than in typical sandstone moist forest. This is due to clay introduced from the shale geology upslope – or from localised shale lenses.

Characterised by a high number of mesic shrubs and small trees.

Trees 25 to 30 metres.

Shrub layer usually dense.

Ground layer dense with many ferns and twiners.

Typical plants*

Trees Sydney red gum *Angophora costata*, turpentine *Syncarpia glomulifera*, Sydney peppermint *Eucalyptus piperita*, blackbutt *Eucalyptus pilularis*.

Small trees mock olive *Notelaea longifolia*, blueberry ash *Elaeocarpus reticulatus*, sweet pittosporum *Pittosporum undulatum*, Coachwood *Ceratopetalum apetalum*, forest she-oak *Allocasuarina torulosa*, cheese tree *Glochidion ferdinandi*, muttonwood *Myrsine variabilis*.

Shrubs hop bush *Dodonaea triquetra*, elderberry panax *Polyscias sambucifolia*, hairy pittosporum *Pittosporum revolutum*, breynia *Breynia oblongifolia*.

Ground layer blue flax lily *Dianella caerulea*, mat-rush *Lomandra longifolia*, pastel flower *Pseuderanthemum variable*, variable sword-sedge *Lepidosperma laterale*, germander raspwort *Gonocarpus teucroides*, wiry panic *Entolasia stricta*, tussock grass *Poa affinis*, weeping rice grass *Microlaena stipoides* var. *stipoides*, bordered panic *Entolasia marginata*, soft bracken *Calochlaena dubia*, bracken *Pteridium esculentum*.

Vines and climbers Sarsparilla *Smilax glycyphylla*, wonga wonga *Pandorea pandorana*, wombat berry *Eustrephus latifolius*, twining guinea flower *Hibbertia dentata*, appleberry *Billardiera scandens*, water vine *Cissus hypoglauca*.



Wombat berry.



Ferny groundlayer and small trees (muttonwood).



Twining guinea flower.



Image: uia Flickr by eyeweed.

Fauna example Leaf-green tree frog

Found around rocky streams, with waterside vegetation.



Coachwood seedlings germinating on the moist, mossy ground.

Status not endangered – considered to be adequately protected in reserves.

In sandstone gullies with shelter from sun, wind and fire, rainforest occurs in narrow bands fringing the creeks. Humidity and soil moisture is higher. Soils may be slightly deeper, although some rocky creeklines have very little soil. These sites are flood prone – particularly in urban catchments. Water gums are specialists in surviving powerful flows and the battering of flood debris.

Like all rainforest, the canopy is dense and shady, but the number of species is low compared to typical rainforest.

Trees 10 to 24 metres high. This includes emergent eucalypts that may be part of adjoining, drier forest – plus a dense canopy of small trees.

Vines and climbers are few compared to typical rainforest.

Ground layer is open or ferny.

Typical plants*

Tall trees Turpentine *Syncarpia glomulifera*, Sydney peppermint, *Eucalyptus piperita*, Coachwood *Ceratopetalum apetalum*.

Smaller trees Christmas bush *Ceratopetalum gummiferum*, black wattle *Callicoma serratifolia*, water gum *Tristaniopsis laurina*, sweet pittosporum *Pittosporum undulatum*, snow-in-summer *Melaleuca linariifolia*.

Shrubs Parramatta wattle *Acacia parramattensis*, Sydney golden-wattle *Acacia longifolia*, lily pilly *Acmena smithii*.

Vines and climbers Jasmine morinda *Morinda jasminoides*, devils twine *Cassytha pubescens*.

Ground layer soft bracken *Calochlaena dubia*, rasp fern *Doodia caudata*, mat-rush *Lomandra longifolia*, common rush *Juncus usitatus*, basket grass *Oplismenus* spp., native violet *Viola hederacea*.

Native Vegetation of the Sydney
Metropolitan Area Classification

Coastal Sandstone Gallery Rainforest

Structural Class closed forest.

Statewide Vegetation Class Northern Warm Temperate Rainforests.

NSW Plant Community Type Coastal Sandstone Gallery Rainforest (1828).

Sometimes also described as riparian forest or gallery rainforest.



The dense canopy prevents most of the sunlight from reaching the ground.



The pale trunks of watergums stand out among the black wattle and coachwood.



There is often a rapid transition to drier, more open country away from the creeks.

*Includes all plants listed in the OEH 2016 profile summaries, minus any that are rare or absent at Lake Parramatta.

NSW: Biodiversity Conservation Act 2016. **V:** vulnerable.

Source: Environmental Partnership NSW Pty Ltd (2012) *Lake Parramatta Reserve Plan of Management*.

*Additional record from Council staff, volunteers or contractors.

Native plants

recorded in Lake Parramatta Reserve

Sundew *Drosera peltata*

33 Lake Parramatta Reserve

Scientific name

Ferns

Adiantum aethiopicum
Asplenium australasicum
Asplenium flabellifolium
Blechnum ambiguum
Blechnum cartilagineum
Calochlaena dubia
Cheilanthes sieberi subsp. *sieberi*
Christella dentata
Cyathea australis
Doodia aspera
Histiopteris incisa
Lindsaea linearis
Pellaea falcata var. *falcata*
Pteridium esculentum

Rushes and sedges

*Baumea articulata**
Caustis flexuosa
Cyperus flaccidus
Empodisma minus
Gania aspera
Gahnia clarkei
Juncus planifolius
Juncus usitatus
Lepidosperma laterale
Lepidosperma lineare
Lepyrodia scariosa
Lomandra filiformis
Lomandra longifolia
Lomandra multiflora
Lomandra obliqua
Machaerina juncea
Schoenoplectus validus
Schoenus melanostachys

Grasses

Anisopogon avenaceus
Aristida vagans
Austrostipa pubescens
Cymbopogon refractus
Dichelachne micrantha
Digitaria parviflora
Echinopogon caespitosus var. *caespitosus*
Echinopogon ovatus
Entolasia marginata
Entolasia stricta
Eragrostis brownii
Eragrostis leptostachya
Imperata cylindrica
Joycea pallida
Lachnagrostis filiformis
Microlaena stipoides var. *stipoides*
Oplismenus aemulus
Oplismenus imbecillis
Panicum simile
Poa affinis
Paspalidium distans
Sporobolus creber
Themeda triandra

Common name

Maiden hair fern
 Bird's nest fern
 Necklace fern
 Water fern
 Gristle fern
 Soft bracken
 Mulga fern
 Binung fern
 Rough tree fern
 Rasp fern
 Batwing fern
 Screw fern
 Sickie fern
 Bracken fern

Jointed twig rush
 Old man's beard
 Flaccid sedge
 Spreading rope-rush
 Rough saw-sedge
 Tall saw-sedge
 Broad-leaf rush
 Common rush
 Variable sword-sedge
 Sword-sedge
 Scale-rush
 Wattle mat-rush
 Mat-rush
 Many-flowered mat-rush
 Fish bones
 Bare twig-rush
 River club-rush
 Black bog-rush

Oat speargrass
 Threeawn speargrass
 Speargrass
 Barbed wire grass
 Shorthair plume grass
 Smallflower fingergrass
 Tufted hedgehog grass
 Forest hedgehog grass
 Bordered panic grass
 Wiry panic grass
 Browns lovegrass
 Paddock lovegrass
 Blady grass
 Red anther wallaby grass
 Blown grass
 Weeping rice grass
 Basket grass
 Basket grass
 Two-coloured panic
 Tussock grass
 Shotgrass
 Slender rat's tail grass
 Kangaroo grass



Adiantum aethiopicum
Maidenhair fern



Blechnum cartilagineum
Gristle fern



Calochlaena dubia
Soft bracken



Doodia aspera
Rasp fern



Lomandra longifolia
Mat-rush



Schoenus melanostachys
Black bog-rush

Orchids and lilies

*Acianthus fornicatus**
Arthropodium milleflorum
*Caleana major**
*Calochilus paludosis**
*Cryptostylis erecta**
Dianella caerulea
Dianella revoluta
Dipodium variegatum
Patersonia sericea
Pterostylis concinna
Stylidium productum
*Thysanotus tuberosus**

Groundcovers and herbs

Brunoniella pumilio
Centella asiatica
Commelina cyanea
Dichondra repens
*Drosera peltata**
Gonocarpus teucrioides
Lobelia gracilis
Goodenia hederacea subsp. *hederacea*
Opercularia varia
Oxalis perennans
Persicaria hydropiper
Persicaria lapathifolia
Phyllanthus hirtellus
Platysace lanceolata
Platysace linearifolia
Plectranthus parviflorus
Pomax umbellata
Pseuderanthemum variabile
Rhytidisporum procumbens
Senecio diascidies
Solanum prinophyllum
Tetragonia tetragonoides
Veronica plebeia
Viola hederacea
Wahlenbergia gracilis

Vines, climbers and scramblers

Billardiera scandens
Cassytha pubescens
Cayratia clematidea
Cissus hypoglauca
Clematis glycinoides var. *glycinoides*
*Comesperma volubile**
Desmodium rhytidophyllum
Einadia trigonos subsp. *trigonos*
Eustrephus latifolius
Glycine clandestina
Glycine microphylla
Glycine tabacina
Hardenbergia violacea
Hibbertia dentata
Hibbertia empetrifolia
Kennedia rubicunda
Morinda jasminoides
Pandorea pandorana
Parsonia straminea
Passiflora herbertiana
Smilax glycyphylla
Tylophora barbata

Pixie orchid
Pale vanilla lily
Flying duck orchid
Red beardie
Hooded orchid
Blue flax lily
Mauve flax lily
Hyacinth orchid
Silky purple flag
Trim greenhood
Trigger plant
Common fringe lily

Dwarf trumpet
Pennywort
Scurvy weed
Kidney weed
Sundew
Germander raspwort

Violet-leaved goodenia
Variable stinkweed
Grassland wood-sorrel
Water pepper
Knotweed
Thyme spurge
Native parsnip
Carrot tops
Cockspur
Pomax
Pastel flower
White marianth
Groundsel
Forest nightshade
Warrigal greens
Creeping speedwell
Native violet
Native bluebell

Appleberry
Devils twine
Native grape
Water vine
Forest clematis
Love creeper
Hairy trefoil
Fish weed
Wombat berry
Love creeper
Small-leaf glycine
Love creeper
False sarsaparilla
Twining guinea flower
Trailing guinea flower
Running postman
Jasmine morinda
Wonga wonga vine
Monkey rope
Native passionfruit
Native sarsaparilla
Bearded tylophora



Dipodium variegatum
Hyacinth orchid



Cryptostylis erecta
Hooded orchid



Dianella caerulea
Blue flax lily



Patersonia sericea
Silky purple flag



Goodenia hederacea
Forest goodenia



Persicaria hydropiper
Water pepper

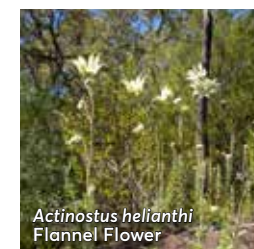
Shrubs

Acacia falciformis
Acacia linifolia
Acacia longifolia subsp. *longifolia*
Acacia suaveolens
Acacia ulicifolia
Acmena smithii
Actinostus helianthi
Astrotricha floccosa
Banksia spinulosa var. *spinulosa*
Bossiaea obcordata
Breynia oblongifolia
Callistemon citrinus
Cassinia aculeata
Correa reflexa
Daviesia genistifolia
Daviesia ulicifolia
Dillwynia retorta
Dillwynia sieberi
Dodonaea triquetra
Einadia hastata
Epacris pulchella
Epacris purpurascens var. *purpurascens*
*Eriostemon australasius**
Goodenia heterophylla
Grevillea linearifolia
Grevillea sericea subsp. *sericea*
Hakea sericea
Hovea linearis
Isopogon anemonifolius
Kunzea ambigua
Lambertia formosa
Lasiopetalum ferrugineum
Leucopogon juniperinus
Leucopogon lanceolatus
Logania albiflora
Lomatia myricoides
Lomatia silaifolia
Maytenus silvestris
Micranthemum ericoides
Notelaea ovata
Olearia microphylla
Ozothamnus diosmifolium
Persoonia pinifolia
Pimelea linifolia
Pittosporum revolutum
Platylobium formosum
Pomaderris aspera
Pomaderris ferruginea
Pultenaea daphnoides
Pultenaea flexilis
Pultenaea retusa
Pultenaea scabra
Sigesbeckia orientalis
Xanthorrhoea arborea
Xanthorrhoea minor
Xanthosia pilosa
Xanthosia tridentata
Zieria pilosa
Zieria smithii

Broad-leaved hickory
Flax-leaved wattle
Sydney golden wattle
Sweet wattle
Prickly Moses
Lilly pilli
Flannel flower
Flannel leaf
Hairpin banksia
Spiny bossiaea
Breynia
Crimson bottlebrush
Common dogwood
Correa
Broom bitter-pea
Gorse bitter-pea
Egg and bacon
Prickly parrot-pea
Common hop bush
Berry saltbush
NSW coral heath
Port Jackson heath **NSW-V**
Pink wax-flower
Variable-leaved goodenia
White spider flower
Pink spider flower
Needlewood
Common hovea
Drumsticks
Tick bush
Mountain devil
Rusty petals
Bearded heath
Lance beard-heath
Logania
River lomatia
Crinkle bush
Orange bark

Mock olive
Bridal daisy bush
Everlasting / paper daisy
Pine-leaf geebung
Slender rice flower
Hairy pittosporum
Handsome flat-pea
Hazel pomaderris
Rusty pomaderris
Bush pea
Graceful bush-pea

Rough bush-pea
Indian weed
Broadleaf grass tree
Grass tree
Hairy xanthosia
Rock xanthosia
Hairy zieria
Sandfly zieria



Actinostus helianthi
Flannel Flower



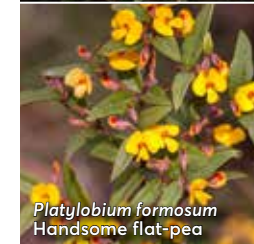
Correa reflexa
Correa



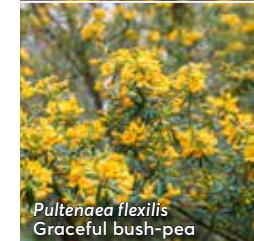
Grevillea linearifolia
White spider flower



Pimelea linifolia
Slender rice flower



Platylobium formosum
Handsome flat-pea



Pultenaea flexilis
Graceful bush-pea

Trees including plants such as blackthorn that are often shrubs but can also reach small tree height.

<i>Acacia decurrens</i>	Sydney green wattle
<i>Acacia falcata</i>	Sickle-leaved wattle
<i>Acacia floribunda</i>	Gossamer wattle
<i>Acacia longissima</i>	Long-leaf wattle
<i>Acacia parramattensis</i>	Parramatta green wattle
<i>Allocasuarina littoralis</i>	Black she-oak
<i>Allocasuarina torulosa</i>	Forest she-oak
<i>Angophora bakeri</i>	Narrow-leaved apple
<i>Angophora costata</i>	Sydney red gum
<i>Banksia serrata</i>	Old man banksia
<i>Bursaria spinosa</i>	Blackthorn
<i>Callicoma serratifolia</i>	Black wattle
<i>Casuarina glauca</i>	Swamp she-oak
<i>Ceratopetalum apetalum</i>	Coachwood
<i>Ceratopetalum gummiferum</i>	NSW christmas bush
<i>Clerodendrum tomentosum</i>	Hairy clerodendron
<i>Corymbia gummifera</i>	Red bloodwood
<i>Cryptocarya microneura</i>	Murrogun
<i>Elaeocarpus reticulatus</i>	Blueberry ash
<i>Eucalyptus amplifolia</i>	Cabbage gum
<i>Eucalyptus fibrosa</i>	Broad-leaved ironbark
<i>Eucalyptus paniculata</i> subsp. <i>paniculata</i>	Grey ironbark
<i>Eucalyptus pilularis</i>	Blackbutt
<i>Eucalyptus piperita</i>	Sydney peppermint
<i>Eucalyptus punctata</i>	Grey gum
<i>Eucalyptus resinifera</i>	Red mahogany
<i>Eucalyptus saligna</i>	Sydney blue gum
<i>Eucalyptus tereticornis</i>	Forest red gum
<i>Exocarpos cupressiformis</i>	Native cherry
<i>Glochidion ferdinandi</i>	Cheese tree
<i>Homalanthus populifolius</i>	Bleeding heart
<i>Leptospermum polygalifolium</i> subsp.	Lemon-scented tea-tree
<i>Polygalifolium</i>	
<i>Leptospermum trinervium</i>	Paperbark tea-tree
<i>Liivistona australis</i>	Cabbage-tree palm
<i>Melaleuca linariifolia</i>	Snow-in-summer
<i>Melaleuca styphelioides</i>	Prickly-leaved paperbark
<i>Melia azedarach</i>	White cedar
<i>Myrsine variabilis</i>	Muttonwood
<i>Notelaea longifolia</i>	Mock olive
<i>Persoonia levis</i>	Broad-leaf geebung
<i>Persoonia linearis</i>	Narrow-leaf geebung
<i>Pittosporum undulatum</i>	Sweet pittosporum
<i>Polyscias sambucifolia</i>	Elderberry panax
<i>Pomaderris intermedia</i>	Tree pomaderris
<i>Quintinia sieberi</i>	Rough possumwood
<i>Syncarpia glomulifera</i>	Turpentine
<i>Trema tomentosa</i>	Native peach
<i>Tristaniopsis laurina</i>	Water gum
<i>Xylomelum pyriforme</i>	Woody pear



Angophora costata
Sydney red gum



Eucalyptus pilularis
Blackbutt



Syncarpia glomulifera
Turpentine



Pittosporum undulatum
Sweet pittosporum



Corymbia gummifera
Red bloodwood



Allocasuarina littoralis
Black she-oak



Ceratopetalum apetalum
Coachwood



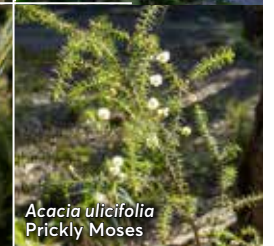
Acacia falcata
Sickle-leaved wattle



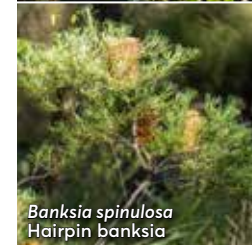
Acacia parramattensis
Parramatta green wattle



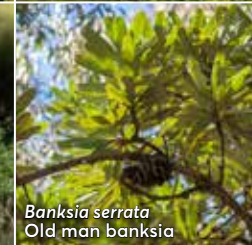
Acacia linifolia
Flax-leaved wattle



Acacia ulicifolia
Prickly Moses



Banksia spinulosa
Hairpin banksia



Banksia serrata
Old man banksia



Persoonia linearis
Narrow-leaf geebung



Persoonia levis
Broad-leaf geebung



Imperata cylindrica
Blady grass



Clematis glycinoides
Clematis



Elaeocarpus reticulatus
Blueberry ash



Ozothamnus diosmifolium
Everlasting



Poa affinis
Tussock grass



Hardenbergia violacea
False sarsaparilla



Bursaria spinosa
Blackthorn



Leucopogon juniperinus
Bearded heath



Themeda triandra
Kangaroo grass



Pandorea pandorana
Wonga wonga vine



Exocarpos cupressiformis
Native cherry



Dodonaea triquetra
Common hop bush

Survey methods:

- direct observation
e.g. spotlighting, night searches for frogs and snails, call playback for night birds
- tracks, scats and other signs
- trapping and releasing
- ultrasonic call recording for microbats
- remote cameras
- analysing hairs left in sticky traps.

The extraordinary echidna. As both an egg-layer and milk-producer it, (along with the platypus), represents an evolutionary link between reptiles and mammals. The reserve's relatively healthy populations of ants and termites provide its food.
Image: Peter Ridgeway.

Native animals recorded in the Hunts Creek corridor

NSW: Biodiversity Conservation Act 2016. **FED:** Environment Protection and Biodiversity Conservation Act 1999.
E: endangered. **V:** vulnerable.

Source: Applied Ecology (2017) *Bushland fauna surveys* October 2016-April 2017.

Fish: Cardno (2010) *Biological Survey of Parramatta Waterways Aquatic Ecology*.

*Additional record from Council staff, volunteers or contractors.

Common name

Mammals

Common brushtail possum
Common ringtail possum
Grey-headed flying-fox
Short-beaked echidna
Sugar glider
Swamp wallaby

Microbats

Eastern broad-nosed bat
Chocolate wattled bat
Gould's wattled bat
Large-footed myotis
Long-eared bat
Ride's freetail bat
Southern freetail bat
White-striped freetail bat
Yellow-bellied sheath-tail bat
A forest bat

Birds

Australasian darter
Australasian grebe
Australian brush-turkey
Australian king-parrot
Australian magpie
Australian raven
Australian wood duck
Black-faced cuckoo-shrike
Black-faced monarch
Brown gerygone
Brown goshawk
Brown thornbill
Channel-billed cuckoo
Chestnut teal
Crested pigeon
Crimson rosella
Dollar bird
Dusky moorhen
Great egret
Eastern koel
Eastern rosella
Eastern spinebill
Eastern whipbird
Eastern yellow robin
Eurasian coot
Galah
Golden whistler
Grey butcherbird
Grey fantail
Grey shrike-thrush
Hardhead
Intermediate egret
Laughing kookaburra
Lewins honeyeater
Little black cormorant
Little corella
Little pied cormorant
Little wattlebird
Magpie-lark
Mistletoebird
New holland honeyeater
Noisy miner
Olive-backed oriole
Owlet Nightjar
Pacific black duck
Pied currawong

Scientific name

Trichosurus vulpecula
Pseudocheirus peregrinus
***Pteropus poliocephalus* NSW-V FED-V**
Tachyglossus aculeatus
Petaurus breviceps
Wallabia bicolor

Scotorepens orion
Chalinolobus morio
Chalinolobus gouldii
***Myotis macropus* NSW-V**
Nyctophilus sp.
Mormopterus ridei
Nyctinomus austra
Tadarida australis
***Saccolaimus flaviventris* NSW-V**
Vespadelus sp

Anhinga novaehollandiae
Tachybaptus novaehollandiae
Alectura lathamii
Alisterus scapularis
Cracticus tibicen
Corvus coronoides
Chenonetta jubata
Coracina novaehollandiae
Monarcha melanopsis
Gerygone mouli
Accipiter fasciatus
Acanthiza pusilla
Scythrops novaehollandiae
Anas castanea
Ocyphaps loquax
Platycercus elegans
Eurystomus orientalis
Gallinula tenebrosa
Ardea alba
Eudynamis orientalis
Platycercus eximius
Acanthorhynchus tenuirostris
Psophodes olivaceus
Eopsaltria australis
Fulica atra
Eolophus roseicapillus
Pachycephala pectoralis
Cracticus torquatus
Rhipidura albiscapa
Colluricincla harmonica
*Aythya australis**
Ardea intermedia
Dacelo novaeguineae
Meliphaga lewinii
Phalacrocorax sulcirostris
Cacatua sanguinea
Microcarbo melanoleucos
Anthochaera chrysoptera
Grallina cyanoleuca
Dicaeum hirundinaceum
Phylidonyris novaehollandiae
Manorina melanoccephala
Oriolus sagittatus
Aegotheles cristatus
Anas superciliosa
Strepera graculina



Swamp wallaby



Australian magpie



Magpie-lark



Pied currawong



Australian raven



Grey butcherbird

Powerful owl
Rainbow lorikeet
Red wattlebird
Red-browed finch
Restless flycatcher
Rufous fantail
Rose robin
Royal spoonbill
Sacred kingfisher
Satin bowerbird
Scarlet honeyeater
Silvereye
Southern boobook
Spotted pardalote
Sulphur-crested cockatoo
Superb fairy-wren
Tawny frogmouth
Varied sitella
Variegated fairy-wren
Welcome swallow
White-bellied sea-eagle
White-browed scrubwren
White-cheeked honeyeater
White-faced heron
White-throated needletail
White-throated nightjar
White-throated treecreeper
Yellow thornbill
Yellow-faced honeyeater

Reptiles

Broad-tailed gecko
Burtons legless lizard
Copper-tailed skink
Dark-flecked garden sunskink
Eastern long-necked turtle
Eastern stone gecko
Eastern water dragon
Eastern water skink
Elegant snake-eyed skink
Jacky dragon
Lace monitor
Red-bellied black snake
Pale-flecked garden sunskink
Three-toed skink
Weasel skink

Fish

Australian smelt
Short-finned eel
Firetailed gudgeon
Eel-tailed catfish

Amphibians

Brown-striped frog
Bibron's toadlet
Common eastern froglet
Leaf-green tree frog
Peron's tree frog
Red-crowned Toadlet

Molluscs*

Dural woodland snail
Red triangle slug*

Ninox strenua **NSW-V**
Trichoglossus haematodus
Anthochaera carunculata
Neochmia temporalis
Myiagra inquieta
Rhipidura rufifrons
*Petroica rosea**
Platalea regia
Todiramphus sanctus
Ptilonorhynchus violaceus
Myzomela sanguinolenta
Zosterops lateralis
Ninox novaeseelandiae
Pardalotus punctatus
Cacatua galerita
Malurus cyaneus
Podargus strigoides
Daphoenositta chrysoptera **NSW-V**
Malurus lamberti
Hirundo neoxena
Haliaeetus leucogaster **NSW-V**
Sericornis frontalis
Phylidonyris niger
Egretta novaehollandiae
Hirundapus caudacutus
Eurostopodus mystacalis
Cornobates leucophaea
Acanthiza nana
Lichenostomus chrysops chrysops

Phyllurus platurus
Lialis burtonis
Ctenotus taeniolatus
Lampropholis delicata
Chelodina longicollis
Diplodactylus vittatus
Physignathus lesueurii
Eulamprus quoyii
Cryptoblepharus pulcher
Amphibolurus muricatus
Varanus varius
Pseudechis porphyriacus
Lampropholis guichenoti
Saiphos equalis
Saprosaurus mustelinus

Retropinna semoni
Anguilla australis
Hypseleotris galii
Tandanus tandanus

Limnodynastes peronii
Pseudophryne bibronii
Crinia signifera
Litoria phyllochroa
Litoria peronii
Pseudophryne australis **NSW-V**

Pommerhelix duralensis **NSW-E/FED-E**
Triboniophorus graeffei



Lace monitor



Dark-flecked garden sunskink



Eastern water skink



Copper-tailed skink



Red triangle slug



Red triangle slug feeding trails



Australian wood duck



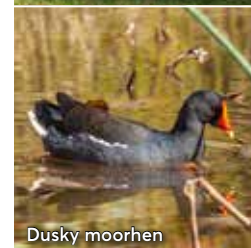
Pacific black duck



Chestnut teal



Australasian grebe



Dusky moorhen



Eurasian coot



Great egret



Little pied cormorant



Crimson rosella



Eastern rosella



Rainbow lorikeet



Australian king-parrot



Sulphur-crested cockatoo



Red wattlebird



Lewins honeyeater



Eastern spinebill



Superb fairy-wren



Grey fantail



Rufous fantail



Eastern yellow robin



Red-browed finch



Silvereye



Golden whistler



Satin bowerbird

*Invertebrates have not been surveyed.

Natural history timeline

Significant dates and events for Lake Parramatta Reserve and surrounding bushland.

1943

Surrounding landuse is mainly rural.

The ridgetop is in a largely natural state.

Weed invasion of the creek and the reserve as a whole is probably minimal.

Exposed sandy soil shows as white. Unrestricted vehicle access allowed a proliferation of tracks, and disturbance of highly-erodible soils.

The original beach and swimming area

Filtering beds were part of the water supply system.

Main entry. The road winds around the lake, revealing water views.

Land is being subdivided into residential blocks.

2021

Surrounding landuse is mainly residential.

Extensive regeneration of native plants and weeds around Darling Mills Creek since 1943.

Urban development on the ridge.

Loss of ridgetop vegetation.

Ongoing impacts on the natural areas below, e.g. stormwater runoff and nutrient enrichment.

Sediment and weeds are choking the creek.

Lighter green patches are probably weed dominated – altered by soil disturbance and/or stormwater runoff.

The main entry was moved to Lackey St in 1979, and passes under a major road.

Native plants are regenerating in some previously cleared areas.

Construction of James Ruse Drive destroyed a large area of bushland, and isolated the southern section.

Image: Google Earth.

Image: Sixmaps/NSW Government.

ABORIGINAL LAND

For many thousands of years The Hunts Creek area is part of a network of respected and well-understood and well-managed natural landscapes, providing everything needed by the people connected to them – including, most recently, **the Burramattagall clan of the Dharug people.**

CULTURAL UPHEAVAL

1788 British colonists arrive, claiming possession of the land under English law. **Traditional Aboriginal life around Sydney is disrupted.** Many people die, and social structures were damaged, in the smallpox epidemic that sweeps Australia's east coast in the 1790s. Competition from the new settlers for land and resources soon make traditional lifestyles impossible. But **knowledge and cultural connections always remained strong**, with many Dharug people continuing to live in, or have enduring associations with, the local area – ensuring an unbroken link to the present day.

EARLY EUROPEAN SETTLEMENT



1799 plan surveyed by Grimes & Flinders.
State Library NSW.

1790s To encourage farming, the government gives away parcels of land around Sydney.

Parts of Hunts Creek bushland are granted to Richard Partridge (1796) and Peter Smith (1797), but they don't appear to have settled there.

Hunts Creek is valued as a place of scenic beauty for picnics and sight seeing.

EARLY FARMING ERA: LOSS OF REGIONAL BUSHLAND

Early 1800s With hand tools and horse power, the settlers clear bushland on the flatter, more fertile, shale soil areas. First for grain crops then grazing and orchards. Later, for poultry farms and market gardens. The tall Blue Gum and Turpentine-Ironbark forests that once surrounded Hunts Creek disappear. Residential development later spreads across these areas.

1818 A dam is built at the end of Marsden St. Fish migration between the estuary and upper Parramatta River is blocked.

45 Lake Parramatta Reserve

AS LANDUSE CHANGES, MORE VULNERABLE NATIVE ANIMALS START TO DISAPPEAR

An illegal alcohol industry flourishes in the rugged Hunts Creek bushland, before generous rewards for dobbing in distillers make it too risky. In 1806 Joseph Holt had a still at the back of his property (now part of The Kings School). He wrote in his diary 'I had in plantation as many peaches as would make me 500 gallons of cider.'*

1825-1826 John Raine built a steam flour mill (The Darling Mills) at the junction of Hunts Creek and Darling Mills Creek. **Farmers quickly arrive to clear land and grow wheat.** But in 1829 a wheat rust disease appears, devastating crops and destroying the new industry.

1826-1830 Bushrangers hideout. This sparsely populated area, with its rugged bushland, attracts bushrangers. Jack Donohue (The 'Wild Colonial Boy'), John MacNamara and William Underwood hid in caves near creeks at North Rocks, and robbed travellers on the roads until they were eventually arrested.

1832 Corporal David Nairn is granted 76 acres south of North Rocks Rd, including the western half of Seville Reserve.

1835 Joseph Seville is granted 50 acres south of Hunts Creek next to Windsor Rd. He names the creek after Samuel Hunt, his brother-in-law. 158 years later, Seville Reserve was named after him.



c1855 W.H. Wells.
State Library NSW.

HUNTS CREEK BUSHLAND PROTECTED TO ENSURE CLEAN WATER

1856 A masonry arch-walled dam is constructed on Hunts Creek forming the Lake Parramatta reservoir.

1857 Illawong Drive is constructed.

1859 Edwyn Henry Statham bought 300 acres from Thomas James, including the western half of Hunts Creek Reserve. He named the property Lambert Grove, and established an orchard. He built a house near what is now the junction of Statham Ave and North Rocks Rd. Statham Ave began as the track he took to Parramatta.

*A rum story, the adventures of Joseph Holt.

1880s Bushland around the lake is protected, and known as Hunts Creek Water Reserve.

1881 A pipe network is constructed to bring water from the dam to Parramatta.

1887 A road network around the lake edge, part of an employment creation scheme, is completed.

INCREASING URBANISATION: FURTHER LOSS OF BUSHLAND

1889-1915 After Edwyn Statham dies in 1887, his family subdivide Lambert Grove, selling off small acreages, as the Statham Estate.

Early 1890 Foxes arrive, creating a new problem for wildlife in the region.

Early 1890s Federation era. Residential development intensifies to the east around Beecroft, Epping and Eastwood.

1898 To meet increased water demand, the dam is raised with the addition of a 3.3 m concrete rim.



Image: Parramatta Heritage Centre.

1905 James Burns owns Rockcliff (224 North Rocks Rd, granted to David Nairn in 1832), and Gowan Brae.

BUSHLAND OR HOUSES FOR 'THE OLD WATER RESERVE'?

1909 Parramatta is connected to Sydney's water system, and the dam is no longer needed. The Water Board considers harvesting the timber, and selling the land for housing.



Cumberland Argus & Fruitgrowers
Advocate, 26/10/1927.

Parramatta Council and the Parramatta North Progress Association campaign to 'keep that miniature "national park" in its natural state for the beauty for the benefit of future ages'.

Alderman Simpson in CA&FA, 20/12/1916

1923 James Burns dies, leaving part of his land to the Presbyterian Church. It later becomes The Kings School. This landuse allowed much of the bushland to be preserved, providing **a corridor linking Lake Parramatta with Seville Reserve and Hunts Creek Reserve.**

LAKE PARRAMATTA BECOMES A PUBLIC RESERVE



1924 The Water Board agrees to hand over the old water reserve.

1927 Ownership of most of the land switches from Metropolitan Water and Sewage Board (1926) to the Crown. It is managed by Parramatta Council as a recreational area.

A strip of land along the North Rocks Road ridgetop, is excluded from the reserve for housing subdivision, creating 'urban boundary' impacts on natural areas downslope.

1930 Now named Lake Parramatta, the new public reserve is officially opened.

1930s Lake Parramatta is popular for swimming, rowing, water-skiing, picnicking, bushwalking and experiencing nature. A swimming club, and a lifesaving organisation are established.



A popular swimming spot 1938.
Image: Hood Collection, State Library of NSW.

Lake Parramatta, the Gem of the District

Glorious Expanse of Water Among the Hills

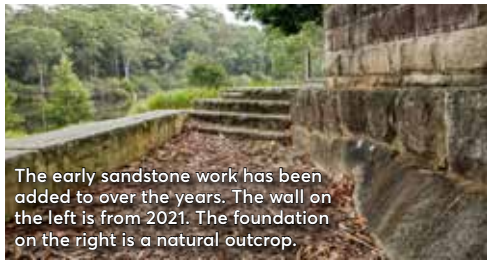
COUNCIL BUSY WITH SCHEME OF IMPROVEMENTS

Cumberland Argus & Fruitgrowers Advocate 28/12/1933

Council undertakes building, roadwork, landscaping, and tree planting in the reserve.

'Thousands of tonnes of earth have been used in the formation of roadways to give adequate access while the reserve's resources of stone have been liberally exploited to form rockeries and borders. Dressing rooms, boat sheds, 25 shelter sheds, a refreshment kiosk, and now a fine new clubhouse and ambulance room ... are among the improvements'.

CA&FA 28/01/1937



The early sandstone work has been added to over the years. The wall on the left is from 2021. The foundation on the right is a natural outcrop.

1940 Drought and water extraction cause the water level to drop, and most of the lake bed is exposed.

1943 Lake Parramatta is closed to swimming, due to poor water quality. There are also noise complaints from residents about speedboats.

"SHOULD CLOSE IT"

ALDERMAN'S VIEW OF LAKE PARRAMATTA

"If the council spends any more money at Lake Parramatta, we all ought to be arrested."

This justification of wholesale aldermanic apprehension was suggested last night by Alderman Cameron.

He said that Lake Parramatta was an eyesore, serving no useful purpose, and that the council should close it straightway.

Cumberland Argus & Fruitgrowers Advocate, 28/1/1942

1951 An attempt to contain Sydney's urban sprawl. The Cumberland Plan (developed by the Cumberland County Council, and adopted by the NSW Government) included Lake Parramatta in a proposed green belt around Sydney.

SYDNEY'S POST-WAR BUILDING BOOM

1950s Increased residential development.

Increasing damage from human activities, mainly:

- rubbish dumping, including car bodies and building waste
- removal of bushrock and other natural resources
- unrestricted car and trail bike access disturbs soil, plants, and animals.

Visitor numbers drop, due largely to:

- private cars expanding people's travel options
- restrictions on recreational use of the lake
- declining condition of bushland and water.

1958 Nature gets priority. 'the preservation and restoration of the bushland area and the maintenance and development of the recreational area' becomes Council's objective for the Reserve. In 1960 Lake Parramatta Reserve (excluding the lake itself) was proclaimed a fauna sanctuary.

1960 'Despite the opening of the modern Parramatta Swimming Centre, the Lake has retained the popularity it has enjoyed in recent years. On an exceptionally hot night last January, 1,200 people were counted swimming in the lake shortly before midnight'. Cumberland Argus 5/9/1960.

1960s The ridgeline along North Rocks Rd is developed for housing.

1964 Restriction on urban development in Sydney's green belt (including most of Carlingford) are lifted, opening it up for urban development. Bushland in the Hunts Creek corridor will soon become an island in a sea of suburbia: cut off from other natural areas.

SOCIAL CHANGE: INCREASING INTEREST IN PROTECTING THE NATURAL ENVIRONMENT

Baulkham Hills Shire Council proposes a Flora and Fauna Reserve along Hunts Creek, acquiring the first section in 1964, and adding more until 1976, when it reaches its present size of 36 ha.

1972-1984 Carlingford North Rocks Bushland Trust (CNRBT) forms and campaigns for protection of bushland in the Hunts Creek area.

1974 CNRBT expresses concern about the growth of weeds in Hunts Creek Reserve.

1975-6 Sewer carriers are installed along Hunts Creek, and through Seville Reserve. The disturbance increases siltation and weed growth.

1978 Lake Parramatta Reserve is closed to traffic, ending large-scale dumping and vehicle damage.

1979 James Ruse Drive opens. It cuts through the Reserve, destroying much of the Turpentine-Ironbark Forest, isolating two southern sections, and greatly increasing traffic noise.

The original main entrance from Lake St is closed. The Lackey Street underpass, and a new entrance is constructed.



Building James Ruse Drive through the southern section of the Reserve.
Image: CoP Community Archives Collection.

1980s To support recreational fishing, the NSW Department of Agriculture begins regular releases of native bass fishlings in Lake Parramatta.

Mid 1980s Techniques for regenerating damaged native ecosystems are becoming more widely known, and community interest increases. Sydney's **first volunteer bushcare groups** form, including at Lake Parramatta Reserve.

1983 The lake was emptied to allow maintenance of the dam wall. Rubbish was removed, including car bodies.

1989-2006 Upper Parramatta River Catchment Trust (UPRCT) forms to address flooding and drainage issues.

1990s Urban development in West Pennant Hills and Castle Hill intensifies, causing further loss of local bush, including Blue Gum High Forest.

Early 1990s The Lake Parramatta Conservation Committee forms. This community group starts monthly working bees to tackle growing infestations of weeds such as lantana, privet, and weedy vines. They also lobby Parramatta City Council to do more to manage the bushland.

1990 The **first bushland management plan** for the Reserve is produced (National Trust 1990), including surveys of bushland condition, vegetation communities, and a plant species list.

1995 The local community (via surveys) indicates a strong desire for Lake Parramatta to be safe for swimming again. UPRCT launches the 'Swim Towards 2005' program.



1998-2006 UPRCT develops the *Green Corridors Vegetation Management Strategy*, and provides funding for ecological restoration in the catchment.

1997 Lake Parramatta Dam is listed as a 'National Engineering Landmark'.

1999 The first comprehensive management plan for the Reserve is produced, including a strategy to repair and manage natural assets.

INCREASING POPULATION GROWTH, AND MEDIUM AND HIGH DENSITY DEVELOPMENT

Visitor numbers, and pressures on nature increase.

2006 Testing reveals water quality in Lake Parramatta meets standard for swimming. It is reopened for special events.

2006 CoP introduces a Stormwater Management Service Charge to fund better stormwater management, as well as to repair past damage to waterways, bushland and infrastructure.

2008 The Parramatta River Catchment Group (PRCG) forms to restore and protect the river.

2010-11 Upgrading of the visitor precinct, including road realignment and new carpark.

The education facility (ex boatshed) is removed.

2011 Detailed flora and fauna surveys.

2012 An updated management strategy.

2012 Lake Parramatta Dam is added to the NSW Heritage Register 'Australia's first large dam and one of the world's earliest arch dams'.

2014 PRCG launches the 'Our Living River' initiative with a mission to make the Parramatta River swimmable by 2025.

2015 *Parramatta Biodiversity Strategy 2015-2025* identifies Lake Parramatta as **one of Parramatta's core biodiversity areas**.

2015 Lake Parramatta officially re-opens for **public swimming**. Over 12,000 people visit that summer. But pollution threats remain, so ongoing water quality monitoring is essential.

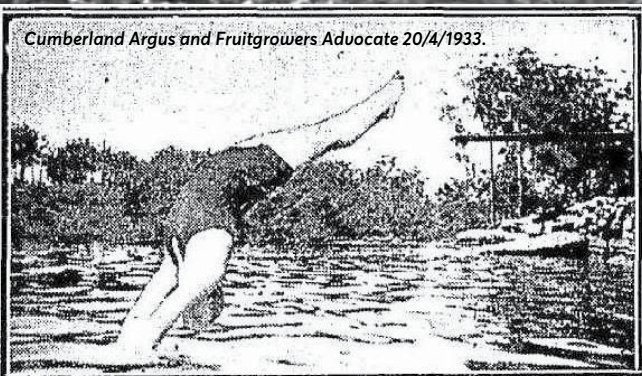
2018 Parramatta River Masterplan *DUBA, BUDU, BARRA: Ten Steps to a Living River* released by PRCG.

2021 A NSW Government grant funds an upgrade of facilities, including the walking track network, creek crossings and new wayfinding system.

AN OPPORTUNITY FOR REGENERATION

The future Our quality of life improves as we respond to climate change, and rethink our relationship with the natural world. We value and care for urban green spaces – including complex natural ecosystems like Lake Parramatta Reserve – and they form an essential part of the renewed, liveable cities that we create.

Cumberland Argus and Fruitgrowers Advocate 20/4/1933.



A PERFECT BACK DIVE by Miss Ronnie Williamson, of Lidcombe, taken at Lake Parramatta.

Lake Parramatta in the summer of 1938, when its clean water and bushland setting attracted crowds of swimmers and picnickers.

Image: The Hood Collection, State Library of NSW.



Managing natural resources

City of Parramatta has an obligation to protect biodiversity under state, federal and international law.

And most people in or community expect our biodiversity to be protected – for future generations to be able to walk in healthy bushland, see native animals, and swim in the lake.

Many bushcare volunteers are skilled regenerators, able to quickly and carefully remove weeds from amongst native plants. But the volunteer program has a role for everyone, including beginners.

Now surrounded by urban landscapes, with increasing numbers of visitors wanting to enjoy this special place, Lake Parramatta Reserve needs ongoing active management to maintain its biodiversity and clean water.

What we are doing:

- surveying and monitoring biodiversity
- monitoring water quality
- managing the catchment to protect water quality through environmental engineering solutions, education programs, and support of volunteer work
- bush regeneration and weed control
- propagating and planting a range of native plant species to compliment and strengthen existing bushland
- installing nest boxes
- feral animal control
- domestic animal control (cats are prohibited from entering the reserve – dogs must be on a lead, and remain on established tracks)
- managing fire hazards, controlled burning
- maintaining tracks, interpretative signage, and other facilities for visitors
- education to help residents and visitors better understand and take care of the reserve.

Who does this:

- bushland management contractors
- bushcare volunteers
- Council staff.

Where does funding come from

Main current sources are:

- rates and levies (e.g. stormwater management charge 2022/2023)
- grants from State and Federal Government (e.g. Lake Parramatta Local Roads and Community Infrastructure Grant 2020/2021)
- fees, charges, and revenue (e.g. from hiring out fields to sports clubs).

In the 1990s and 2000s significant funding came from the Upper Parramatta River Catchment Trust.

How to get involved in bushcare

Contact City of Parramatta's Bushcare team at bushcare@cityofparramatta.nsw.gov.au



Fire is a key tool for maintaining healthy ecosystems.



Bush regeneration contractors controlling the highly-invasive wetland weed *Ludwigia*.
Image: Hills Bushcare.



Bushcare volunteers use kayaks to reach weeds at the lake edge.
Image: Tom Couell (still from video Connect with nature).

Artificial nest boxes can help offset the loss of natural hollows.
Image: Murray Sayle.



Missing understorey species are being replanted in a badly damaged patch of Sydney Turpentine-Ironbark Forest.



Why Lake Parramatta's natural assets need ongoing care and repair

Small patch size and broken connections

It may be the largest in the Parramatta area but, for many plants and animals, this bushland island is too small for a sustainable population. There is nowhere to escape from people, dogs, cars, noise, and artificial lights.

Animals have to cross roads and gardens to reach other bushland patches.

The reserve is further divided by roads and tracks. This is a particular threat to the Dural woodland snail, which is reluctant to cross them.

The dam is a barrier for migratory fish moving between the upper creek system and the Parramatta River estuary.



Even in Parramatta's largest reserve, nowhere is far from human influence.



James Ruse Drive causes significant traffic noise. It disconnected the largest Sydney Turpentine-ironbark Forest remnant from the rest of the reserve.

Weeds

New plants have arrived, and are moving into natural areas. Some prefer to grow in disturbed places like paths and stormwater drains, but others can invade healthy bushland sometimes completely replacing native plants.

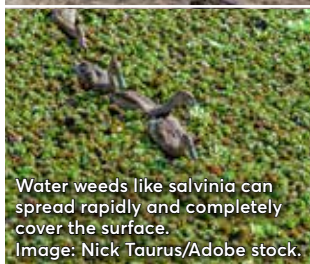
Weeds usually damage habitat, though sometimes (e.g. small birds finding protection in dense lantana) they can be useful.



Broad-leaf privet is a weedy tree that can form dense thickets, dominating bushland in moister areas.



African love grass can cover the ground, leaving no room for native plants. These plants have been killed with herbicide, but ongoing work will be needed to deal with seedling regrowth.



Water weeds like salvinia can spread rapidly and completely cover the surface. Image: Nick Taurus/Adobe stock.

Problem animals

Introduced species like cats, foxes and mosquito fish have already caused local extinctions, and are on track to cause more.

Some aggressive natives such as the noisy minor have increased in number and can drive out other animals.



Introduced mosquito fish compete with native species, e.g. eating frog eggs.

Missing animals

Where are the bearded dragons, lyrebirds, bettongs, boguls, antechinus, quolls, and bandicoots? They, and others, have disappeared, along with the services they provided, like soil turnover, plant pollination and distribution, bushfire fuel management, and keeping food webs in balance.

The balbo (or eastern bettong) vanished from the entire Australian mainland by 1930. They survived in fox-free Tasmania, and are now being reintroduced in predator-free sanctuaries. Image: JJ Harrison.



Changing fire patterns

These are fire-adapted ecosystems. But in an urban environment it's a big challenge to manage fuel loads, and apply the right fire regime for the ecology as well as public safety.



Burning urban bushland is a major operation, needing extensive planning and resources.



The local bushland can regenerate strongly after the right type of fire. And fire is essential for maintaining non-rainforest communities.

Past clearing and damage

We face a legacy of ongoing problems caused by:

- clearing and mowing
- soil disturbance, compaction, erosion, and enrichment
- dumping of soil, building materials and other rubbish
- logging
- removal of bushrock and timber (often crucial habitat)
- animal extinctions.



Parts of the reserve have been permanently altered by disrespectful treatment in the past.

Increase in flooding, erosion and mobile sediment

In a bushland or rural area, much more rain water is absorbed by the soil, and makes its way slowly into the creek system. Now it hits hard surfaces, such as roads, roofs and paving, and is fed immediately into the drainage system. A great volume of water reaches the creek quickly.

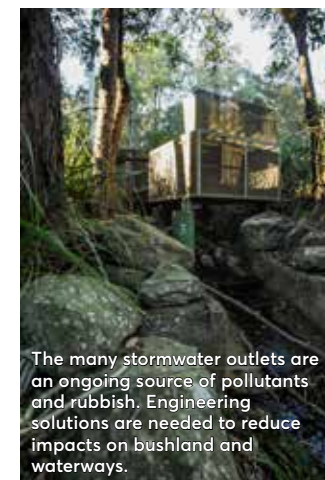
Disturbance of soil and vegetation in the catchment releases loose sand and silt that can wash into the creek, creating sediment deposits that weeds love to colonise.

Urban runoff adds moisture and nutrients to the soil

The local bushland is not adapted to the new conditions, but many weeds are.

Water pollution

Rain water falling in Hunts Creek catchment, along with anything it picks up along the way, ends up in Lake Parramatta. Waterways can become too polluted for swimming after rain, and too polluted for many animals.



The many stormwater outlets are an ongoing source of pollutants and rubbish. Engineering solutions are needed to reduce impacts on bushland and waterways.

People pressure

Visitor numbers are increasing, and so are our many impacts. We mightn't notice, but the presence of humans and dogs causes stress and disruption to many animals. The effort needed to maintain facilities, and provide a safe, enjoyable experience, is also increasing.



Soils in sandstone country erode easily, and heavily-used tracks are difficult to maintain.

Too much rough treatment

It's important for us to interact with and connect with nature, but some of our activities (such as letting dogs off leash, riding bikes on walking tracks and in bushland, and building cubbies) cause unsustainable damage. Also, intentional vandalism of natural features and facilities is a small but ever-present problem.

Climate change

Patterns of fire and rainfall, and the range of temperatures that living things have adapted to, are now changing. We don't fully understand what this will mean for the ecology of local bushland.



Sugar glider. Image: Mark Fuller.



Facilities and features for visitors

Image: Richard O'Brien.

Lake Parramatta Reserve is a shared space: a wildlife protection area, with much for human visitors to experience and enjoy as well.

The main entrance is from Lackey Street, off Bourke Street in North Parramatta. Gates open at 6.30 am and close at 5.30 pm (7.30 pm during daylight saving).

Lake Parramatta Reserve offers:

- **Bushland and waterways with abundant wildlife.**
- **Scenic landscape** with some popular lookouts.
- **Walking trails.** The upgrade in 2020-21 included new creek crossings and signage (map on next page).
- **Swimming area**, with a lifeguard on duty during the official swim season (generally late October to mid-March).
- **Non-motorised boating.**
- **Boat hire.**
- **Dog walking (on leash).**
- **Children's playground.**
- **Public toilets.**
- **BBQs.**
- **Picnic areas.**
- **Cafe.**
- **Off-street car parking.**
- **Fishing.** An average of 5000 native bass fishlings are released annually into Lake Parramatta. Due to water quality issues, the fish should not be eaten. Fishing requires a licence from the state government (service.nsw.gov.au). On-the-spot fines for unlicensed fishing are \$500.

Regulations and cautions

The Upper and Lower Hunts Creek **Crossings may be impassable during and after light to heavy rain.** Do not use the Lake Circuit when water is flowing over stepping stones at creek crossings.

Bush plants and animals are easily damaged by trampling, so **please keep to established tracks.**

Dogs are to be kept on leads at all times, and **cats are not allowed** in the reserve at all.

No bicycles are allowed on walking tracks. Bicycles are permitted on Illawong Drive and sections of the Management Trail in eastern parts of the reserve.

Swimming is not advised outside the designated area.

Clean enough for swimming (mostly)

It's a success story because, for many years, the lake was too polluted for swimming.

There were leaky sewers, and chemical and microbial contaminants washing in from the surrounding catchment. A population of domestic ducks were adding fecal matter.

But the community wanted their wild swimming place back. In 1995 local authorities (mainly City of Parramatta, Hills Shire Council and the Upper Parramatta Catchment Trust) agreed, and they worked to find solutions.

2005 had been the goal, but it wasn't until 2015 that testing showed that Lake Parramatta was consistently clean enough for swimming.

Keeping it clean requires ongoing effort. Heavy rain can make it unsafe again for a while. NSW Health recommends that you do not swim in estuaries or rivers within three days of heavy rain.

City of Parramatta regularly monitors levels of enterococci bacteria, water temperature, pH, phosphorus, nitrogen, turbidity and conductivity.

Getting to Lake Parramatta Reserve

There are 68 car spots on site. When the car park is full, parking is available on surrounding streets.

If arriving by train, disembark at the Parramatta Interchange, and catch the 609 bus from the CBD. The bus stops 50 metres from the entrance to Lake Parramatta every hour Monday to Saturday, and three times on Sundays.

Alternatively, buses that travel along Windsor Road and Pennant Hills Road include stops about 500 metres from the Lake Parramatta entrance.



HERITAGE PATH Grade 1. 300 m one way.

Follow the surfaced, wheelchair-accessible, path from the visitor hub to the Dam Wall Lookout. Short, steeper 'wheelchair assistance required' sections occur.



ARRUNGA BARDO WALK Grade 2. 900 m one way.

Starting from the Arrunga Bardo Garden, follow the evenly-surfaced bush track past Lake Parramatta's finest views to the Arrunga Bardo (calm waters) lookout.



RESERVOIR TRACK Grade 3. 600 m one way.

A short outing to a fine viewpoint. Be prepared for steep steps, rocky track surfaces, and a creek crossing that may be impassable after heavy rain.



UPPER LAKE TRACK Grade 3. 2100 m one way.

Connects the Reservoir Lookout with the Arrunga Bardo Lookout via the top of the lake. Includes steep steps, rocky track surfaces, and a creek crossing that may be impassable after heavy rain.



LAKE CIRCUIT Grade 3. 4200 m loop (2 hours).

Link the Heritage Path, Arrunga Bardo, Reservoir Track and Upper Lake Track together for a memorable lap of the lake.

Other foot track

Management trail



HERITAGE PATH

Before the dam wall was raised in 1898.
Image: from Historic Parramatta, The Cradle of Australia. CoP Community Archives Collection.



Waterbirds can almost always be seen on this part of the lake.

Sickle-leaved wattle in Coastal Shale-Sandstone Forest at the Dam Wall Lookout.

From the viewing platform. Image: Richard O'Brien.



RESERVOIR TRACK



Lake Parramatta dam, circa 1908.
CoP Local Studies Photograph Collection.



The outlet discharging when the dam is full.



The Lower Hunts Creek Crossing is impassable after heavy rain.



The dam overtopping in March 2022.



Reservoir Lookout.

UPPER LAKE TRACK

Sediment settles in the creek below the upper crossing, supporting an abundance of weeds.

The Upper Hunts Creek Crossing is known as flat rock.

The rocky knoll between the two creek crossings.

Parts of the track follow Illawong Drive, a public road until 1978. Some sections retain a constructed surface of sandstone blocks.

An early spring display of egg and bacon pea and pink wax flower.

The best examples of sandstone retaining walls, associated with the old road network and landscaping, can be seen on the peninsula.

Sweet wattle in flower.

ARRUNGA BARDO WALK



The Arrunga Bardo Garden contains a selection of local plants, along with information about their uses – particularly their importance for Aboriginal people.

Stone causeway creek crossing.

Stepping stone creek crossing.

Blackbutt trees on a drier, north-facing slope. The angular sandstone blocks are naturally occurring.

Arrunga Bardo Lookout. Image: Richard O'Brien.

LAKE CIRCUIT

Looking west from the Arunga Bardo Lookout, across the peninsula.



A new wayfinding system was installed in 2021.

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The Parramatta Heritage & Visitor Information Centre

We can assist with information on attractions, educational programs, and how to get around Parramatta.

We offer tours of Lake Parramatta, exploring our rich cultural and natural heritage. Our programs include authentic historical contexts and nature-based experiences, structured activities, and immersive interactions facilitated by our skilled Cultural presenters and in-house guides.

1300 889 714 or 02 8839 3311

discoverparramatta.com

education@cityofparramatta.nsw.gov.au

