

## 2 Features

### 2.1 TOPOGRAPHY & SOILS

#### 2.1.1 Topography

Yeramba Lagoon is situated in a natural lowland area between sandstone ridges. It is separated from the main tidal arm of the Georges River by an area of partially reclaimed land and a constructed weir. Topographic contours are shown in **Figure 2**. Elevation increases with distance from the lagoon, reaching 15 m above mean sea level (EMS 2003).

The lagoon itself is shallow and generally less than 1 m deep. Water level is influenced by climate and drainage inflow to the lagoon. The area of greatest known depth across the lagoon is immediately adjacent to the northern edge of the weir where it is up to 2 m deep. The northern section of the lagoon is comparatively shallow and can be seasonally dry or contain a shallow level of water less than 0.5 m deep. (EMS 2003)

#### 2.1.2 Geology and soils

EMS (2003) analysed site soil bed maps and geology records and found that the lagoon is located on an alluvium, sand, silt and clay base. The lagoon is surrounded by weathered Hawkesbury sandstone in the elevated land surface areas to the north, east and west of the lagoon.

The lagoon's alluvial and silty sediment overlies at greater depths medium to coarse grained quartz sandstone with shale and laminate lenses. Site investigations by EMS (2003) suggested that deposition of sediments and alluvial flow has been responsible for the greater proportion of inter lagoon basin sediments. Fill soils were observed on the terrestrial edge of the southern land boundary of the lagoon and adjacent to the car park and Henry Lawson Drive.

#### 2.1.3 Acid sulphate soils

Acid sulphate soils (ASS) are natural soils that form in seawater or brackish water environments. They generally occur in low lying and flat locations which are often flood prone or swampy, and are common in every estuary and estuarine floodplain in NSW. Council maps<sup>1</sup> indicate that ASS are present across the whole of the Yeramba catchment.

There are five classes of ASS on the map, with Class 1 areas having the highest risk for acid sulphate soils and the greatest constraint to disturbance from development (e.g. dredging). The area between Henry Lawson Drive and the Georges River has Class 1 ASS, the lagoon has Class 2 ASS, and the remainder of the catchment has Class 5 ASS.

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<sup>1</sup> <http://www.bankstown.nsw.gov.au/pdfmap/WebIndexMap.htm>



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Prepared By: AK. Approved By: BM. Status: Draft. Project: MCA. 56. Date: 07/11/08

Figure 2: Topography and flood risk

These soils contain iron sulphides that are stable and do not cause a problem when waterlogged. However when exposed to air, after drainage or excavation, the soils rapidly form sulphuric acid. This acid can leak into the surrounding area acidifying wetlands, creeks, estuaries and bays, causing severe environmental damage. It can affect industries such as fishing and tourism, and can impact on public and private infrastructure by causing serious damage to steel and concrete structures such as the foundations (footings) of a building.

A field assessment of ASS is required prior to any action which may disturb soils in Yeramba catchment. If ASS are found in potentially affected areas, an ASS management plan will need to be prepared in accordance with the NSW ASS Manual.

#### **2.1.4 Erosion**

Land cleared for building construction, particularly in the 1950s and 1960s, has contributed significantly to sedimentation in Yeramba Lagoon and associated waterways. Reduced construction activities and tighter erosion controls in recent years appear to have resulted in less sediment entering the lagoon. Stormwater control devices and street sweeping reduce the quantity of sediment discharged to the lagoon.

Eroded sediment is also sourced from the numerous unsealed tracks within the study area, particularly in bushland to the east of Yeramba Lagoon. Erosion rates are greatest in steep terrain and where there is heavy use by motorbikes. Erosion hazard increases significantly after bushfire or when vegetation is cleared or damaged.

#### **2.1.5 Sediment quality**

In 2003, EMS assessed sediment quality and reported that the lagoon is in a medium level of degradation. High levels of heavy metals (lead, zinc, nickel, copper and chromium), nitrogen and phosphorus were recorded in the northern lagoon area. The main sources of contaminants were associated with access to the southern shore and lagoon boundary (rubbish dumping), and runoff and sewer overflows from the upper northern catchment.

Sediment (and water) quality in the lagoon is likely to have further deteriorated since the assessment in 2003 due to:

- Lack of flushing in the lagoon
- Internal cycling of nutrients and other contaminants associated with weed growth and die-off, and bioturbation

Further degradation will occur if pollution sources and contaminated sediments are not managed. Any management proposal should consider the possibility of sediment disturbance and associated release of contaminants. Channel realignment is not likely to cause a major change to the level of environmental contamination unless sediments are removed from the lagoon.

## 2.2 WATER

### 2.2.1 Water quality

Water quality in Yeramba Lagoon has been monitored by BCC since 1997<sup>2</sup> and is described below based on a report prepared in 2006 and data from 2007 and 2008.

The results indicate that water quality in the lagoon does not consistently comply with ANZECC (2000) *Guidelines for Fresh and Marine Water Quality* for a range of parameters. Poor water quality is associated with influxes and cycling of sediment, nutrients and pathogens. High nutrient concentrations cause proliferation of aquatic weeds and lead to deteriorating aesthetic and ecological quality. Colour and odour are also affected by stratification and seasonal overturning of the water body, where it is of sufficient depth.

The Sydney Metropolitan CMA is developing a model to predict long term improvements in water quality in Botany Bay and the Georges River that will result from implementation of a proposed water quality improvement plan.

### 2.2.2 Flood risk

Flood risk mapping was conducted for the *Georges River Flood Study* by Bewsher Consulting (2004). As shown in **Figure 2**, Yeramba Lagoon has a high risk of flooding, and its low-lying foreshores and associated drainage lines have medium to low risk of flooding. Residential areas and the majority of the national park were found not to be at risk of flooding.

Bewsher Consulting (2004) identified the low-lying section of Henry Lawson Drive as a 'road inundation problem area'. Inundation of this major arterial road during floods could restrict access, evacuation and emergency management operations.

The hydrology of Yeramba Lagoon, its drainage lines and outlet to the Georges River have not been investigated in detail.

### 2.2.3 Sea level rise

Mean sea level along the NSW coast is predicted to rise 40 cm by 2050 and 90 cm by 2100 (*NSW Government Draft Sea Level Rise Policy Statement* 2009). This will have implications for flood risk, estuarine habitats and geomorphology, and therefore have implications for the future management of the lagoon. Potential sea level rise needs to be considered in the detailed design for the proposed weir removal and lagoon restoration.

## 2.3 ECOLOGY

### 2.3.1 Vegetation communities

The distribution of vegetation communities has been mapped by NPWS (2002) as shown in **Figure 3**. Remnant vegetation in the upper catchment is primarily Turpentine-Ironbark Margin Forest. Bushland in the mid catchment is the Upper Georges River Sandstone Woodland. Western Sandstone Gully Forest is found in the lower catchment. The lagoon is described as Freshwater Wetlands and the drainage gully from Amberdale Avenue at the upper end of the lagoon is Alluvial Woodland.

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<sup>2</sup> Parameters monitored include temperature, total phosphorus, TKN, nitrogen, conductivity, salinity, dissolved oxygen, pH, ORP, turbidity, suspended solids, chlorophyll a and faecal coliforms.

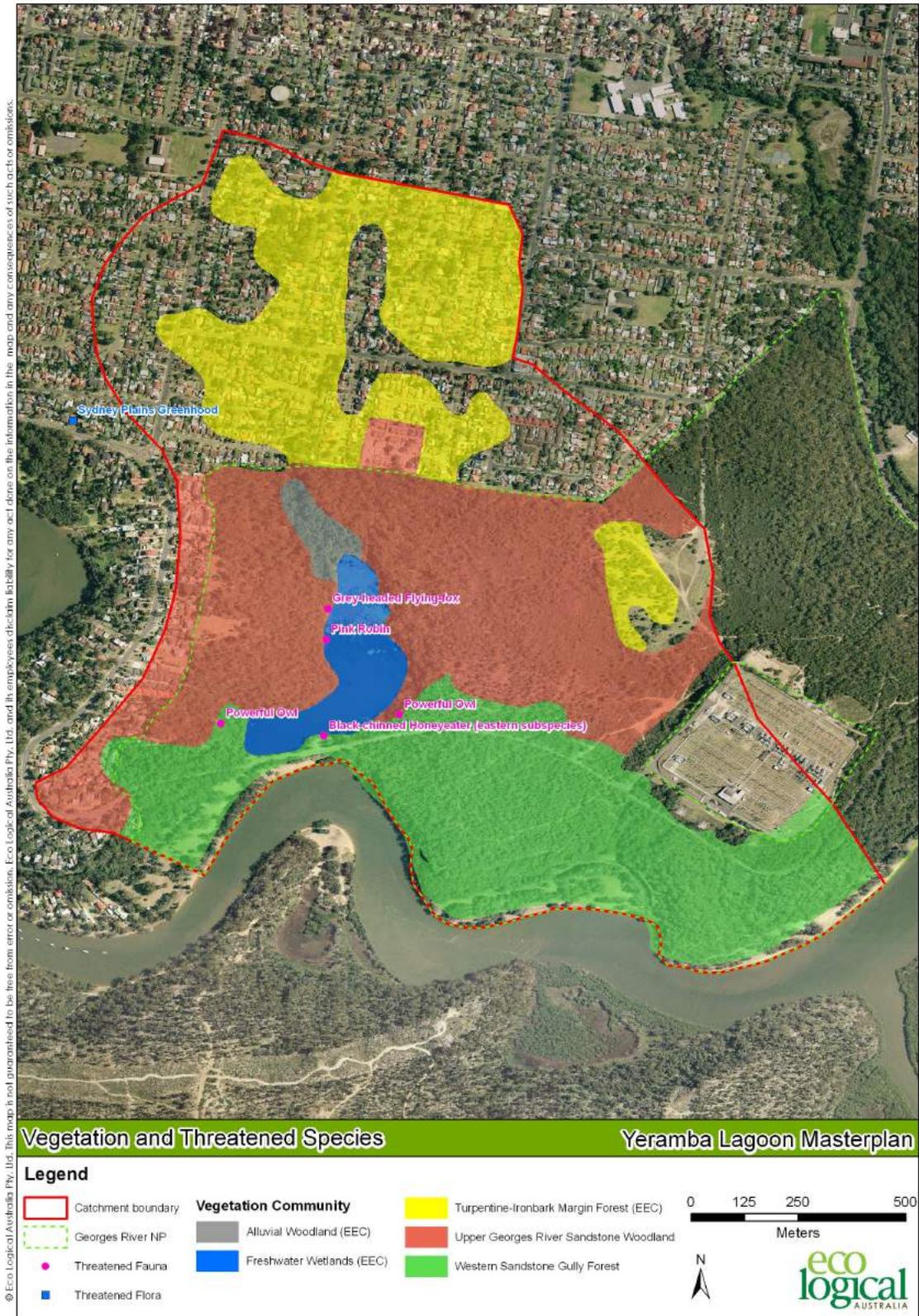


Figure 3: Vegetation communities and threatened fauna

Species typically associated with each vegetation community found within the study area are tabulated in **Appendix C**. Endangered Ecological Communities (EECs) recognised under the *NSW Threatened Species Conservation Act 1995* (TSC Act) are identified in the table and in **Figure 3**. EECs face a very high risk of extinction in New South Wales in the near future.

Most native vegetation in the Yeramba catchment is protected within the Georges River National Park. The integrity of this bushland can be maintained and improved by:

- Bush regeneration, including weed removal
- Revegetation using local provenance stock
- Closure and rehabilitation of walking tracks in sensitive areas (e.g. near the edge of the lagoon)
- Reducing contaminants (e.g. weeds and nutrients) into the bush
- Community education to protect ecological values (e.g. use preferred tracks, don't pick wildflowers or walk dogs in the park)

### 2.3.2 Threatened flora

*Pterostylis saxicola* (Sydney Plains Greenhood Orchid) has been recorded near the study area (**Figure 3**) and is endangered under the TSC Act. This means that the species is likely to become extinct in nature in NSW unless the circumstances and factors threatening its survival or evolutionary development cease to operate. Targeted survey is required to establish the number of plants in this population, their condition and specific threats (e.g. weeds, fire, tracks). Threat abatement measures could include bush regeneration, revision of fire management guidelines and rehabilitation of unwanted nearby tracks.



*Pterostylis saxicola* (Sydney Plains Greenhood Orchid)<sup>3</sup>

<sup>3</sup> Photo source and additional information:

<http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10705>

### 2.3.3 Fauna

A search of the NSW Wildlife Atlas in 2009 found records of four threatened fauna species (**Figure 3**) in the study area. These species are listed in **Table 1** with additional species that were identified from the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (EPBC) Protected Matters database search and community<sup>4</sup> records. Based on these sources of information there are:

- Six vulnerable species under the TSC Act
- 33 marine species under (EPBC Act)
- Seven migratory species under the EPBC Act

Threats to these species include (but are not limited to):

- Reduced water quality due to siltation and pollution
- Drainage of wetlands and ponds
- Predation by foxes, dogs and cats
- Use of herbicides, pesticides and other chemicals near wetland areas
- Clearing and fragmentation of habitat
- Exclusion from smaller remnants by aggressive species such as the Noisy Miner (*Manorina melanocephala*)
- Disturbance during the breeding period
- Frequent hazard reduction burning
- Road kills
- Illegal hunting
- Rubbish dumping
- Electrocutation on powerlines

Actions required to recover these species include (but are not limited to):

- Protect wetlands and water-courses from pollution
- Undertake fox and feral cat control in and nearby wetlands
- Protect wetlands, ponds and associated marshy areas from clearing, disturbance and inappropriate fire regimes
- Retain suitable woodland habitats, particularly those with an intact native ground plant layer
- Increase the size and connectivity of existing remnants, planting trees and establishing buffer zones
- Retain or reintroduce ecologically sustainable water flows to wetland and swamp habitat. Allow swamps to be flooded periodically and floodwaters to recede naturally
- Makes sure inappropriate pesticides and herbicides are kept well away from wetlands
- Assist in determining distribution and population size of threatened species by recording sightings and submitting them to the NPWS Wildlife Atlas
- Report illegal hunting to police

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<sup>4</sup> The Bankstown Bushland Society (Mackay and Nordstrom) have produced a brochure listing species that have been observed in the Yeramba area.

- Retain large stands of native vegetation, especially those containing hollow-bearing trees
- Protect riparian vegetation to preserve roosting areas
- Identify powerline blackspots and implement measures to reduce fauna deaths

**Table 1: Threatened fauna species in Yeramba catchment**

SPECIES	COMMON NAME	TSC ACT STATUS*	EPBC ACT STATUS*
<i>Accipiter fasciatus</i>	Brown Goshawk	-	Marine
<i>Ardea ibis</i>	Cattle Egret	-	Migratory (CAMBA, JAMBA), Marine
<i>Ardea intermedia</i>	Intermediate Egret	-	Marine
<i>Ardea modesta (Ardea alba)</i>	Great Egret	-	Migratory (CAMBA, JAMBA), Marine
<i>Biziura lobata</i>	Musk Duck	-	Marine
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Vulnerable	-
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	-	Marine
<i>Cacomantis pallidus</i>	Pallid Cuckoo	-	Marine
<i>Chalcites basalus</i>	Horsfield's Bronze Cuckoo	-	Marine
<i>Larus novaehollandiae</i>	Silver Gull	-	Marine
<i>Chrysococcyx lucidus</i>	Shining Bronze Cuckoo	-	Marine
<i>Circus approximans</i>	Swamp Harrier	-	Marine
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	-	Marine
<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	-	Marine
<i>Coracina tenuirostris</i>	Cicadabird	-	Marine
<i>Dicrurus bracteatus</i>	Spangled Drongo	-	Marine
<i>Egretta garzetta</i>	Little Egret	-	Marine
<i>Eudynamys scolopacea</i>	Common Koel	-	Marine
<i>Eurystomus orientalis</i>	Dollarbird	-	Marine
<i>Falco cenchroides</i>	Nankeen Kestrel	-	Marine
<i>Gallinago hardwickii</i>	Latham's Snipe	-	Migratory (Bonn, CAMBA, JAMBA, ROKAMBA), Marine
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	-	Migratory (CAMBA), Marine
<i>Haliastur sphenurus</i>	Whistling Kite	-	Marine
<i>Himantopus himantopus</i>	Black-winged Stilt	-	Marine
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	Migratory (CAMBA, JAMBA, ROKAMBA), Marine
<i>Meliphreptus gularis gularis</i>	Black-chinned Honeyeater (Eastern sub-species)	Vulnerable**	-
<i>Monarcha frater</i>	Black-faced Monarch	-	Migratory (Bonn), Marine
<i>Ninox novaeseelandiae</i>	Southern Boobook	-	Marine
<i>Ninox strenua</i>	Powerful Owl	Vulnerable**	-
<i>Nycticorax caledonicus</i>	Nankeen Night Heron	-	Marine
<i>Oxyura australis</i>	Blue-billed Duck	Vulnerable	-
<i>Pelecanus conspicillatus</i>	Australian Pelican	-	Marine
<i>Petroica rodinogaster</i>	Pink Robin	Vulnerable**	-
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable**	Vulnerable
<i>Rhipidura rufifrons</i>	Rufous Fantail	-	Migratory (Bonn), Marine
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	-	Marine
<i>Threskiornis molucca</i>	Australian White Ibis	-	Marine
<i>Todiramphus sanctus</i>	Sacred Kingfisher	-	Marine

Sources: NSW Wildlife Atlas (2009), EPBC Act Protected Matters Search (2009), Mackay & Nordstrom (2008), ELA (2008)

\* '-' indicates that the species is not listed as threatened under the relevant legislation

\*\* NSW Wildlife Atlas record

A complete list of fauna observed in the vicinity of Yeramba lagoon is provided in **Appendix C**. It is based on NSW Wildlife Atlas and EPBC Act database searches, species observed by ELA during field investigation on 15 December 2008 and records provided by Bankstown Bushland Society.

### 2.3.4 Pest species

#### *Introduced fauna*

Introduced fauna species observed in the study area are listed in **Table 2**. Domestic dogs that escape from yards or walk unleashed in the national park are also a threat to native fauna.

**Table 2: Introduced fauna**

SPECIES	COMMON NAME
<i>Acridotheres tristis</i>	Indian Myna
<i>Anas platyrhynchos</i>	Mallard
<i>Anser sp.</i>	Domestic Goose
<i>Felis catus</i>	Cat
<i>Gambusia affinis</i>	Mosquito Fish
<i>Lepus europaeus</i>	Brown Hare
<i>Oryctolagus cuniculus</i>	European Rabbit
<i>Passer sp.</i>	Sparrow
<i>Trachemys scripta elegans</i>	Red-eared Slider Turtles
<i>Vulpes vulpes</i>	Fox

The Mallard was introduced into Australia from the Northern Hemisphere and is closely related to the Pacific Black Duck. The two species are very similar in habits and occupy the same niche in the two regions. The two species will interbreed in situations where Mallards have been released.

#### *Weeds*

Weed infestations are concentrated in Yeramba Lagoon and its drainage lines. Weeds that were recorded by ELA on 15 December 2008 are listed in **Table 3**. There are five noxious weeds and four weeds of national significance.

The *Noxious Weeds Act 1993* (NW Act) specifies the duties of landholders for control of noxious weeds. Under Section 13 of the NW Act, public authorities such as the Department of Environment, Climate Change and Water are required to prevent the spread of weeds to adjoining lands.

Table 3: Weed species in the Yeramba catchment

SPECIES	COMMON NAME	STATUS IN BANKSTOWN LGA <sup>5</sup>	WEEDS OF NATIONAL SIGNIFICANCE <sup>6</sup>
<i>Acetosa sagittata</i>	Turkey Rhubarb		
<i>Ageratina adenophora</i>	Crofton Weed		
<i>Alternanthera philoxeroides</i>	Alligator weed*	Noxious	Yes
<i>Andropogon virginicus</i>	Whiskey Grass		
<i>Bidens pilosa</i>	Cobbler's Peg		
<i>Bryophyllum delagoense</i>	Mother of Millions		
<i>Cardiospermum grandiflorum</i>	Balloon Vine		
<i>Delairea odorata</i>	Cape Ivy		
<i>Eichhornia crassipes.</i>	Water Hyacinth*	Noxious	
<i>Eragrostis curvula</i>	African Lovegrass		
<i>Lantana spp.</i>	Lantana	Noxious	Yes
<i>Ligustrum lucidum</i>	Large-leaf Privet		
<i>Ligustrum sinense</i>	Small-leaf Privet		
<i>Ludwigia peruviana</i>	Ludwigia*	Noxious	
<i>Nephrolepis cordifolia</i>	Fishbone Fern		
<i>Nymphaea mexicana</i>	Yellow Waterlily*		
<i>Ochna serrata</i>			
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive		
<i>Onopordum acanthium</i>	Scotch Thistle		
<i>Paspalum dilatatum</i>			
<i>Pennisetum clandestinum</i>	Kikuyu		
<i>Protasparagus aethiopicus</i>	Asparagus Fern		
<i>Rubus fruticosus</i> agg.	Blackberry	Noxious	Yes
<i>Salix</i> sp.	Willow	Noxious	Yes
<i>Salvinia molesta</i>	Salvinia*	Noxious	Yes
<i>Schinus areira</i>	Pepper Tree		
<i>Senna pendula</i>			
<i>Tradescantia fluminensis</i>			

\*Aquatic weeds

## 2.4 LAND USE

### 2.4.1 Local Environmental Plan

Land use zones relevant to the Yeramba catchment that are defined by the *Bankstown Local Environmental Plan 2001* include:

- Zone 2(a) Residential A – the majority of the upper catchment
- Zone 5 Special Uses (Electricity Purposes) – the Sydney South substation
- Zone 6(a) Open Space – mainly small, local parks and playgrounds
- Zone 8 National Parks and Nature Reserve - Georges River National Park

<sup>5</sup>[http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed/noxious-app?sq\\_content\\_src=%252BdXJsPWh0dHAIM0EIMkYIMkZ3d3cuYWdyaWMubnN3Lmdvdi5hdSUyRnRvb2xzJTJGdmld2NvdW5jaWwuaHRtbCZhbGw9MQ%253D%253D&council\\_id=5](http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed/noxious-app?sq_content_src=%252BdXJsPWh0dHAIM0EIMkYIMkZ3d3cuYWdyaWMubnN3Lmdvdi5hdSUyRnRvb2xzJTJGdmld2NvdW5jaWwuaHRtbCZhbGw9MQ%253D%253D&council_id=5)

<sup>6</sup> <http://www.weeds.gov.au/weeds/lists/wons.html>

## 2.4.2 Ownership

Yeramba Lagoon and most of the surrounding bushland is part of the Georges River National Park and under the control of NSW National Parks and Wildlife Service. Bankstown City Council has a responsibility to improve the quality of stormwater that may flow into the lagoon from outside the national park boundaries (except sewerage, which is under Sydney Water's jurisdiction). The residential area in the upper catchment is in private ownership.

## 2.5 INFRASTRUCTURE

### 2.5.1 Stormwater

The stormwater network is illustrated in **Figure 4**. It includes infrastructure such as pipes, water pollution control devices and culverts. Unconstructed drainage lines and the lagoon are also shown.

There are two main inflows to the lagoon. The first is the main gully system below Amberdale Avenue that picks up the urban drainage from Amberdale, Samoa, Joyce, Karen and Drysdale Avenues. Stormwater passes through a gross pollutant trap (GPT) and into a detention pond/constructed wetland located behind a residence at the bottom of Amberdale Avenue.

The second is the outlet below Kennedy Street, which also picks up urban drainage and flows into the lagoon after passing through a trash rack. A number of smaller creek systems flow into the lagoon, including two from the east that flow out of the ridgetop heathland.

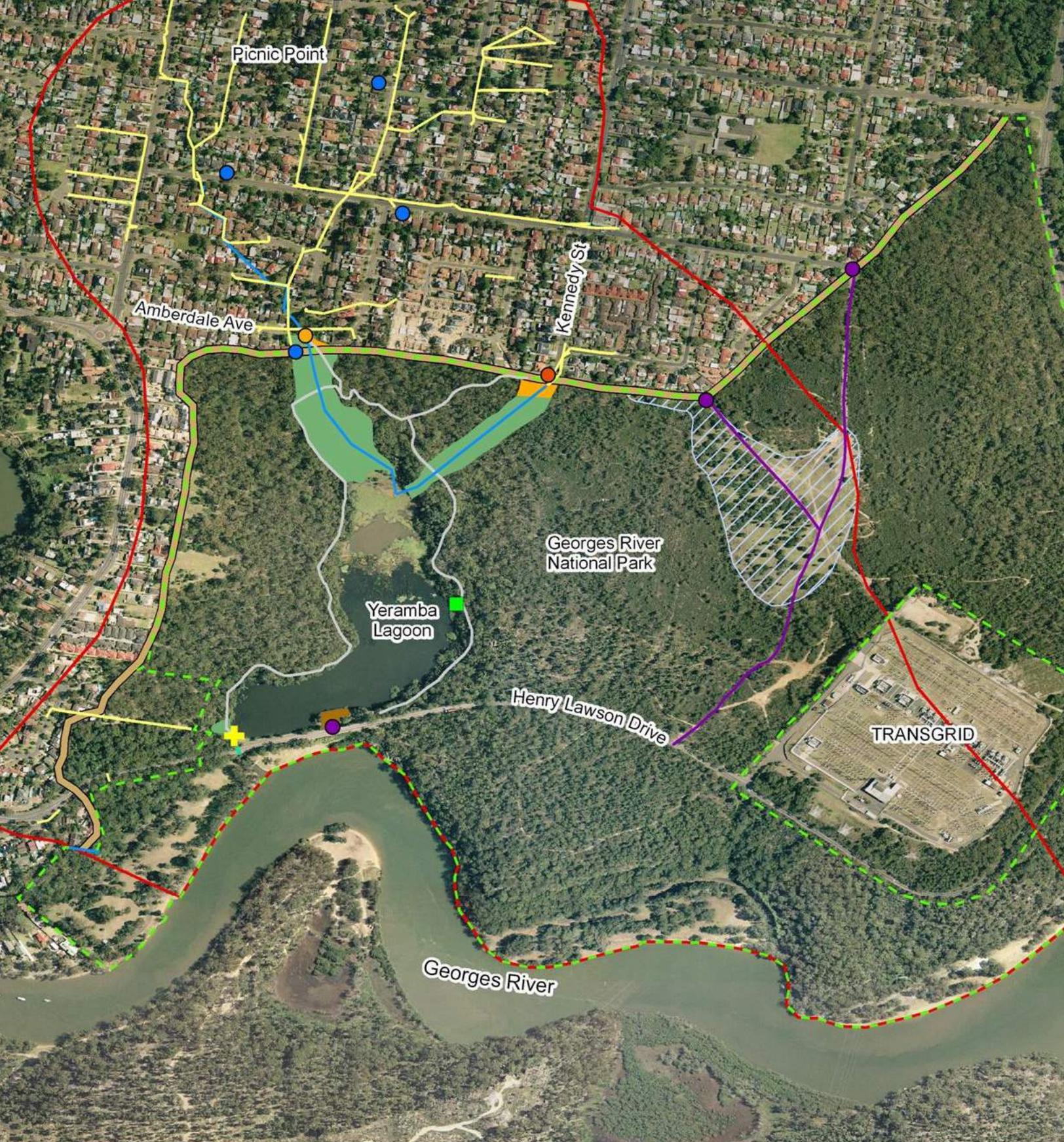
Photos of the detention pond and trash rack are provided on the following pages.

Urban stormwater flows are generated and subside quickly, particularly from Amberdale Avenue, due to the relatively small catchment size and high percentage of impervious areas. In contrast, the vegetated sub-catchments of the two smaller creek systems to the east and south have longer response time and longer flow duration. The sandy soils of the catchment have a high infiltration rate.

Stormwater pollution control devices have been installed at outlets from Amberdale Avenue (GPT and detention pond) and Kennedy Street (trash rack). The GPTs at Amberdale Avenue are maintained by Council. However, the pond and trash rack have received minimal maintenance. Accumulated sediment and pollutants at these locations is undesirable for environmental and aesthetic reasons. Appropriate maintenance of the stormwater pollution control devices at these locations will lead to improved performance.

### 2.5.2 Weir and culverts

Freshwater discharge from the lagoon flows over a concrete weir, through box culverts under Henry Lawson Drive, then along a concrete channel to the Georges River. Their location is indicated in **Figure 4**. Photos of the culvert and weir are given on the following pages.



Existing Features Yeramba Lagoon Masterplan

Legend				
Catchment Boundary	Revegetation	Gate	Culvert	GPT
Georges River NP	Bird Hide	Existing Track	Pipe	Sewer overflow
Weed Infestation	Weed Control	Carpark	Drainage	Trash rack
Asset Protection Zone	Fire Trail			Weir



Constructed stormwater detention pond at Amberdale Ave



Trash rack at Kennedy St



Culverts under Henry Lawson Drive



Weir and footbridge

### 2.5.3 Sewer overflows

Sewer overflows can occur in dry weather because of tree roots blocking pipes or power failure at pumping stations. In wet weather, sewage volumes increase because of groundwater infiltration and illegal connections from stormwater pipes. To cope with increased volumes the sewerage network includes overflow points to allow for release of sewage to the environment, rather than backup to households. Sewage can also discharge to the environment by pipe leakage.

Sewer overflows contribute to the poor health of the lagoon and bushland in drainage lines. They are also undesirable for health and aesthetic reasons. Four sewer overflows have been identified in the catchment (**Figure 4**): downstream of Amberdale Avenue, at the western end of Burns Road, at the northern end of Drysdale Avenue, and in Austin Street.

Sydney Water maintains records of dry weather overflows and wet weather system overflows. There is no data available about the volume of sewage discharged within the catchment during wet or dry overflows, or if the sewage flowed into waterways. It is understood that the SewerFix program has work scheduled in the Bankstown LGA, although Sydney Water has yet to confirm if SewerFix will be operating in the Yeramba catchment.

However, even with improvements to the sewerage system and a reduction in the frequency and volumes of overflows, accumulated sediment, nutrients and other contaminants associated with past sewer overflows and polluted stormwater discharges will continue to adversely impact Yeramba lagoon and surrounds.

### 2.5.4 Roads, access and parking

Henry Lawson Drive is an arterial road through the study area and as such is under the control and management of the Roads and Traffic Authority. Local streets, managed by Council, service the residential area. A car park, which is the responsibility of DECCWW, is provided near the mouth of Yeramba Lagoon and is closed each evening.

Pedestrian access is available to the national park at several locations from surrounding areas, the main ones of which are shown in **Figure 4**. There is a need for improved signage at access points and along the main track network.

Members of the community highly value the ability to access the park from their local streets. This Masterplan does not promote tracks that are not part of the main track network identified in **Figure 4** by identifying them or recommending signage. However, it recognises that many of these walking tracks have minimal impact whilst allowing people to connect to and value the natural environment.

Heavily degraded tracks in the eastern part of the catchment require rehabilitation (erosion control, weed control and revegetation). This degradation is associated with vehicle usage rather than pedestrian access. Short side-tracks from the loop track which pass through sensitive areas (e.g. boggy ground) also need to be rehabilitated.

### 2.5.5 Electricity sub-station

An electricity sub-station to the east of the lagoon is the largest utility feature in the catchment (**Figure 4**). Management of the sub-station property, however does not appear to affect conditions in the national park or lagoon.

### 2.5.6 Recreation

Recreational activities in the national park include walking, bird watching, fishing and picnicking along the foreshore. There are a few small parks and playgrounds in the residential area (e.g. Austin Reserve). Environmental Partnership (2001) proposed improvements to recreational services which could include car barriers, bins, seats, barbeque facilities, signage and shelters. Some existing picnic facilities are degraded and need to be removed or replaced (e.g. chairs and table setting in Fitzgerald Park).

## 2.6 HERITAGE

Aboriginal people from the Eora nation, particularly those from the Badigal clan lived in the Bankstown area prior to European settlement. The *Georges River Community Open Space Plan of Management* (Environmental Partnership 2001) indicates that Aboriginal hand stencils have been recorded in the study area.

An Aboriginal Heritage Information Management System (AHIMS) database search was conducted in 2009. Only one site has been recorded in the study area – a ‘shelter with art’. The shelter is located in a relatively secluded part of the catchment. Results of AHIMS searches cannot be made available to the public because of the risk of potential damage to heritage values.

## 2.7 VISUAL AND LANDSCAPE CHARACTER

Landscapes within the study area include:

- Residential – predominantly single dwellings with established gardens and occasional small local parks and playgrounds
- Bushland – dense native vegetation
- Lagoon and foreshore – reeds and open water in the lagoon, with flat grassed foreshore at the southern end
- River foreshore – grassed parkland with occasional trees

Views across the lagoon are available from rock outcrops at various locations adjacent to the loop track. An example is provided below.

