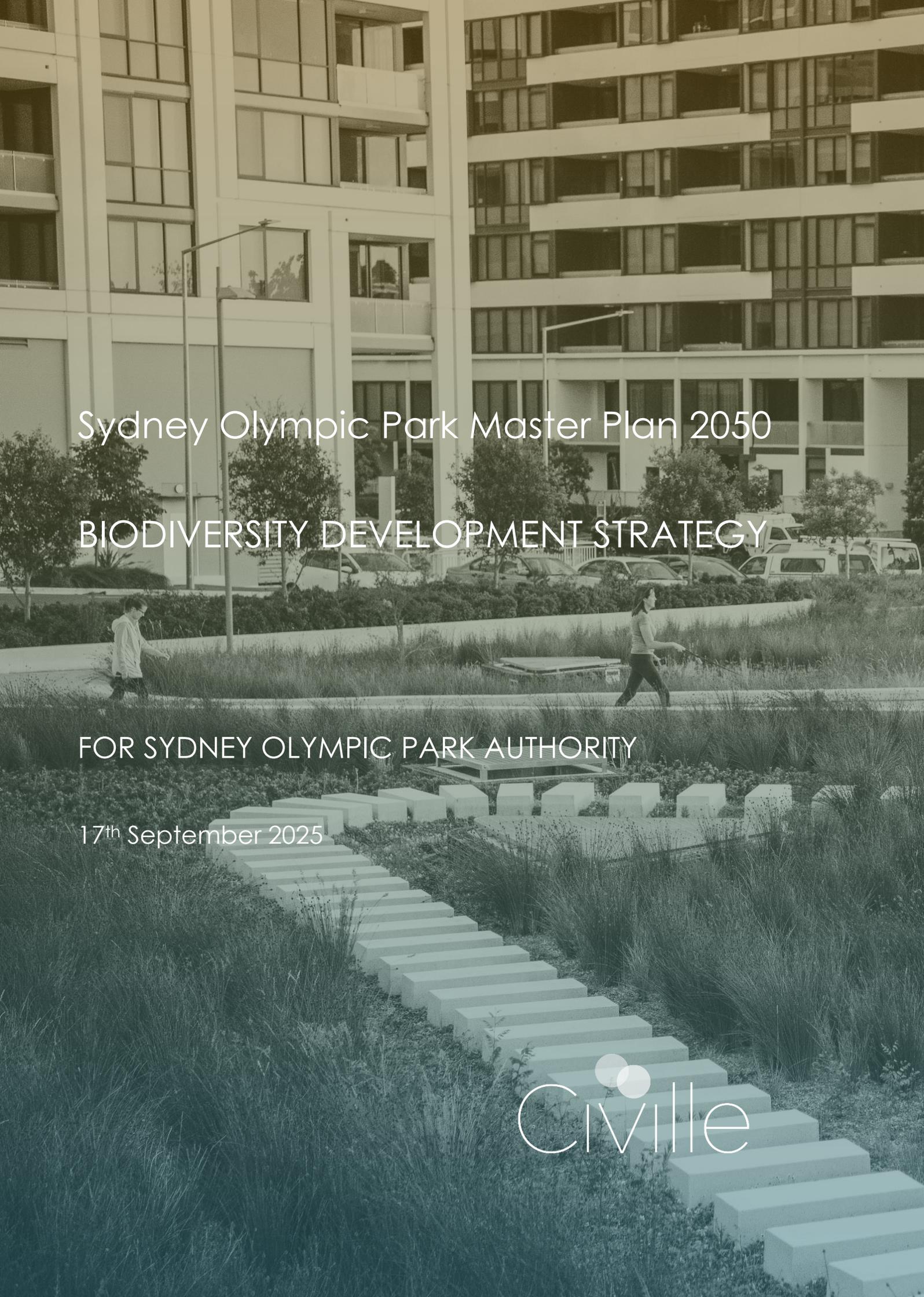


# Annexure AA: Biodiversity Development Strategy



Sydney Olympic Park Master Plan 2050

BIODIVERSITY DEVELOPMENT STRATEGY

FOR SYDNEY OLYMPIC PARK AUTHORITY

17<sup>th</sup> September 2025

Civille



**Project client:** Sydney Olympic Park Authority

**Project name:** Sydney Olympic Park Master Plan 2050 – Biodiversity Development Strategy

**Project number:** 2524

**Date:** 17<sup>th</sup> September 2025

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DOCUMENT HISTORY AND STATUS

Revision	Status	Date	By	Checked
A	Draft for review and comment	01.07.2025	TH	DK
B	Revised draft	15.08.2025	TH	DK
C	Final draft	19.08.2025	TH	DK
D	Final draft v2	17.09.2025	TH	DK
E	Revised for CPHR Comments	31.10.2025	DK	DK

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# EXECUTIVE SUMMARY

Civille were engaged by Sydney Olympic Park to prepare a strategy for managing potential impacts to biodiversity as a result of the development potential for Sydney Olympic Park outlined in the Sydney Olympic Park Master Plan 2050. The Master Plan 2050 has the potential to result in increases in threats, both directly and indirectly, on biodiversity. By meeting demands for significant increases in housing and both passive and active recreation, the Parklands biodiversity will experience higher loads of disturbance through increased use and land changes.

The scope of this strategy was to:

- Understand the land use changes proposed for Sydney Olympic Park under the draft Sydney Olympic Park Master Plan 2050
- Understand relevant legislative requirements
- Map Sydney Olympic Park's existing biodiversity assets with reference to key master plan sites
- Identify areas where works could have potential impacts on biodiversity within Sydney Olympic Park
- Provide implementation measures to avoid and minimise potential impacts to biodiversity as a result of the proposed land use intensification due to implementation of the Sydney Olympic Park Master Plan 2050

Sydney Olympic Park has a range of existing established guidelines, plans and procedures to avoid and mitigate potential impacts to environmentally sensitive flora, fauna and ecological communities within and surrounding Sydney Olympic Park's land.

Civille undertook a desktop mapping exercise with reference to the following desktop sources:

- Sydney Olympic Park DRAFT Biodiversity Management Plan (BMP)
- Sydney Olympic Park BMP maps (Refer to Appendix A)
- Biodiversity Values Map (Biodiversity Conservation Act 2016)
- Threatened Ecological Communities Greater Sydney map
- Coastal Wetlands (State Environmental Planning Policy (Resilience and Hazards) 2021)
- NSW Bionet Species Sightings
- Sydney Olympic Park Master Plan 2050

Through desktop analysis it was determined that there were six possible locations where biodiversity impacts could occur, as a result of development intensification:

- Proposed Haslams Neighbourhood
- Proposed Stadia Precinct
- Proposed Eastern Neighbourhood (1EN, 2EN)
- Proposed Eastern Neighbourhood (3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN)
- Newington Armory site
- Woo-la-ra Precinct

As a result of development in Sydney Olympic Park following the adoption of the Master Plan 2050, biodiversity impacts could occur at the six aforementioned sites. Therefore, this strategy has identified a number of measures to be implemented as development is planned and carried out to mitigate impacts to biodiversity within and surrounding Sydney Olympic Park. These recommended measures require specific site investigations to be undertaken at the time of each development once it progresses including a Biodiversity Assessment Method (BAM) and preparation of a Biodiversity Development Assessment Report (BDAR) where this is considered to be required.

# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

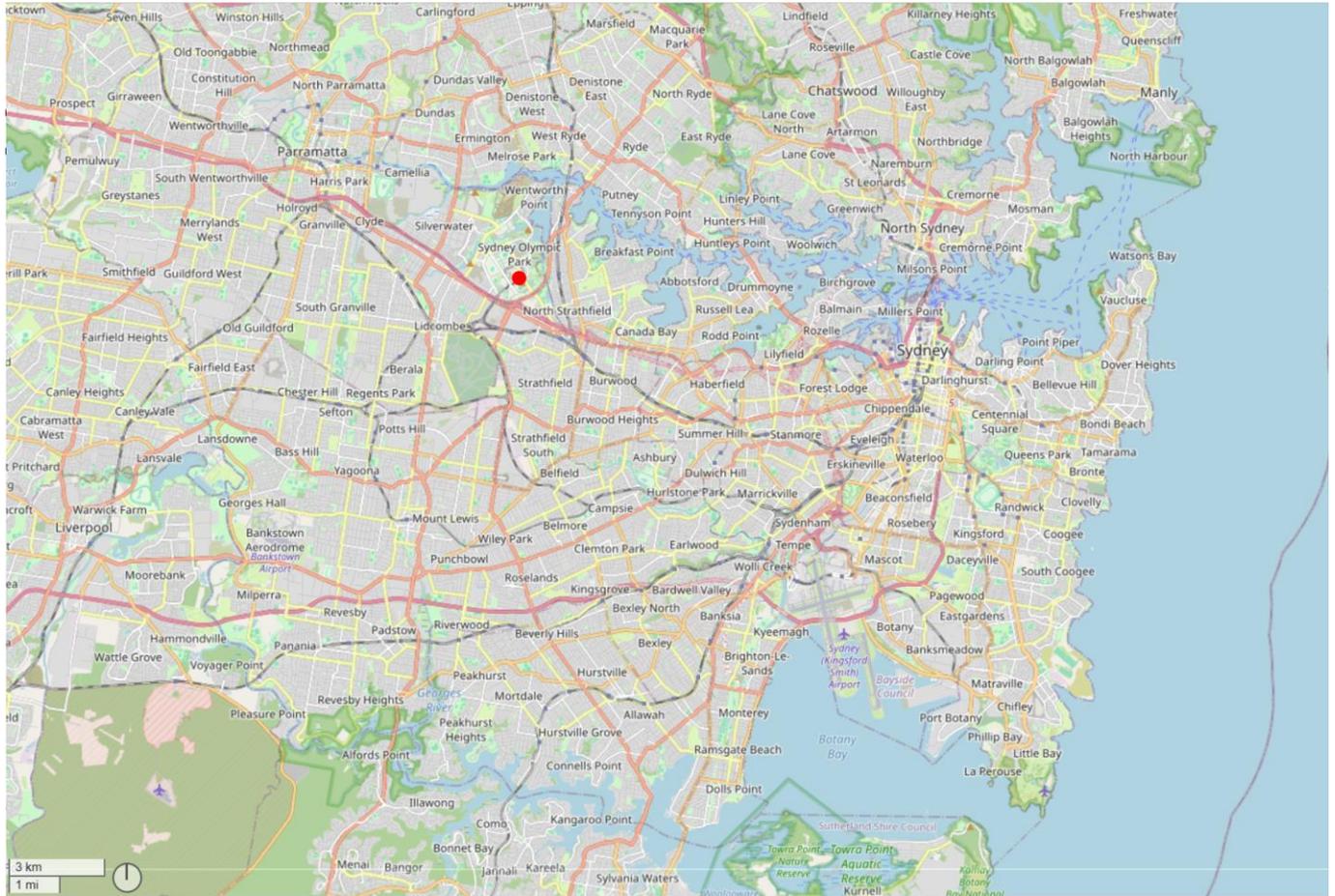
### 1.1.1 SYDNEY OLYMPIC PARK

Sydney Olympic Park is located ~12 km west of the Sydney CBD on the Parramatta River within the City of Parramatta (COP) local government area. Sydney Olympic Park is a former industrial area which has become a significant biodiversity hotspot adjacent to urban development. The area was home to the Sydney 2000 Olympic and Paralympic Games, since then it has become an important location for recreation, entertainment, living, employment and environmental conservation.

Sydney Olympic Park has high ecological value and consists of:

- Habitat for ~70 species of local waterbirds and migratory shorebirds, of which 49 species are listed on international protection agreements (i.e. China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA))
- Critically endangered ecological community, Sydney Turpentine Ironbark Forest (STIF)
- Endangered ecological community, Swamp Oak Floodplain Forest (SOFF)
- a State significant site for the conservation of the Green and Golden Bell Frog (*Ranoidea aurea*), recognised as a Priority Managed Site under the NSW Governments Saving Our Species Program.
- The estuarine wetlands of Newington Nature Reserve and Badu Mangroves, totalling 100 hectares, are both listed on the Commonwealth's Directory of Important Wetlands in Australia, and are classified as 'key fish habitat' under NSW legislation
- A breeding pair of the threatened White-bellied Sea Eagle (*Haliaeetus leucogaster*)
- Significant areas of the endangered ecological community of Coastal Saltmarsh, including the threatened plant species, the Narrow-leafed *Wilsonia* (*Wilsonia Backhousei*).
- The largest mangrove forests in the Parramatta River Estuary
- Endangered freshwater aquatic plant, Horned Pondweed (*Zannichellia palustris*)
- Significant populations of resident woodland birds, disappearing from the urban landscape of Sydney
- 14 species of microbat, six of which are threatened and four having maternity roosts in the Park

It is important that the potential impacts of the Sydney Olympic Park Master Plan 2050 and amendments to the *State Environmental Planning Policy (Precincts—Central River City) 2021* on biodiversity at Sydney Olympic Park are adequately considered.



**Figure 1 Site context map (Source: OpenStreetMap). Red dot indicates site location**

### 1.1.2 DRAFT SYDNEY OLYMPIC PARK MASTER PLAN 2050

Sydney Olympic Park Master Plan 2050 (Master Plan 2050) provides a coordinated, long term development plan to support the ongoing transformation of Sydney Olympic Park into a thriving suburb, strategically located in the centre of Greater Sydney.

Master Plan 2050 aims to balance certainty with flexibility enabling Sydney Olympic Park's future to be resilient, dynamic and able to leverage future opportunities and technologies not yet known.

The draft Master Plan 2050 was exhibited from 28 October 2024 to 29 November 2024. The exhibition package included the following:

- The Master Plan 2050
- Explanation of Intended Effects identifying associated amendments to *State Environmental Planning Policy (Precincts – Central River City) 2021* (Central River City SEPP 2021)
- Supporting technical reports.

A total of 498 submissions were received from stakeholders, the community and leaseholders.

A range of issues were raised in the submissions relating to draft Master Plan 2050 and supporting technical reports, which related to:

- Housing and jobs targets
- Land uses
- Building heights and floor space ratio (FSR) and miscellaneous built form controls
- Transport and parking

- Open space and landscaping
- Infrastructure provision
- Environmental considerations
- Events

In response to the submissions, Master Plan 2050 has been refined, and supplementary or updated technical reports have been provided.

This document responds to issues raised regarding environmental considerations within Master Plan 2050.

The boundary and land use zones of the proposed Sydney Olympic Park Master Plan 2050 (Master Plan 2050) are shown in Figure 2.

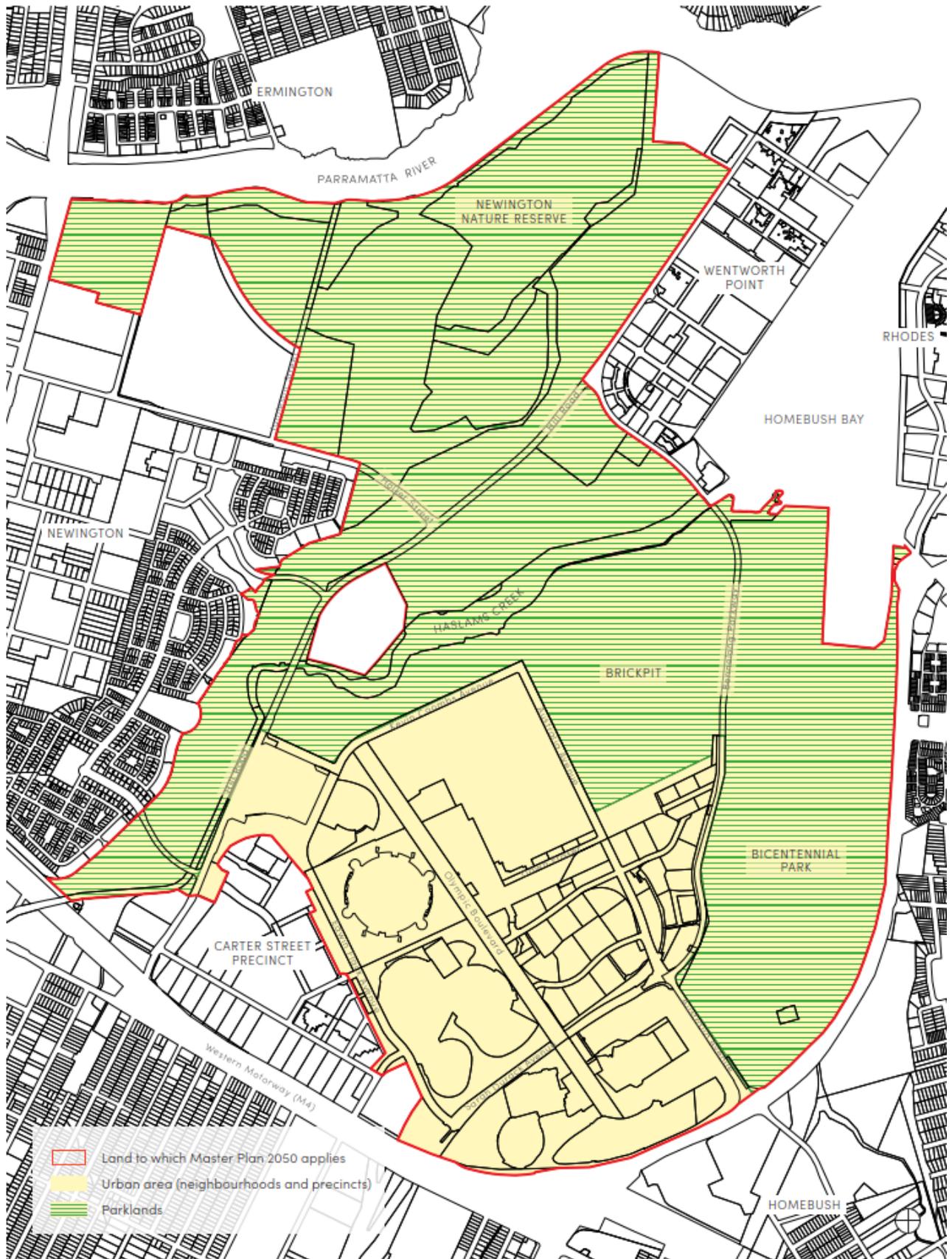
### 1.1.3 PROPOSED CRC SEPP AMENDMENTS

In addition to the proposed Master Plan 2050, a number of amendments are proposed to the *State Environmental Planning Policy (Precincts—Central River City) 2021* (CRC SEPP). The following amendments to the existing CRC SEPP are proposed:

- amendments to the land use zoning map to include MU1 Mixed Use Zone, E1 Local Centre and E2 Commercial Centre
- amendments to maximum building heights and floor space ratios to achieve desired built form outcomes envisaged in Master Plan 2050
- inclusion of additional permitted land uses at Newington Armory, Abattoir Heritage Precinct, Sydney Olympic Park Precinct Management Centre and Bicentennial Park
- amendments to clarify design excellence processes
- inclusion of a clause requiring an affordable housing contribution

## 1.2 STUDY AREA

The study area for this report is the land that applies to the Master Plan 2050 as shown in Figure 2. The majority of this area is owned and managed by Sydney Olympic Park.



**Figure 2 Study area (Source: Master Plan 2050)**

### 1.3 OBJECTIVES AND SCOPE

The objectives and scope of this Biodiversity Strategy is to:

- Summarise the relevant legislation that underpins development and biodiversity protection in Sydney Olympic Park
- Summarise the existing well-established guidelines, plans and procedures Sydney Olympic Park have in place to protect biodiversity from development impacts
- Provide a desktop analysis of proposed development changes as per the Master Plan 2050 and Sydney Olympic Park's ecological mapping
- Identify areas of potential impacts on biodiversity in Sydney Olympic Park
- Provide a strategy to manage potential impacts upon biodiversity for potentially affected areas, threatened ecological communities and/or threatened species

## 2 LEGISLATIVE AND POLICY CONTEXT

### 2.1 SYDNEY OLYMPIC PARK AUTHORITY ACT 2001

The Sydney Olympic Park Authority (SOPA) was established on 1<sup>st</sup> July 2001 and is governed by the *Sydney Olympic Park Authority Act 2001* (SOPA Act). The SOPA Act is a legally binding piece of legislation that was gazetted in NSW Parliament.

The SOPA Act outlines the basis for management of Sydney Olympic Park area and to control development and protect the environment and heritage values of Sydney Olympic Park. The SOPA Act has the following objectives:

- (a) ensure that Sydney Olympic Park becomes an active and vibrant centre within metropolitan Sydney, and*
- (b) ensure that Sydney Olympic Park becomes a premium destination for cultural, entertainment, recreation and sporting events, and*
- (c) ensure that any new development carried out under or in accordance with this Act accords with best practice accessibility standards and environmental and town planning standards, and*
- (d) ensure the protection and enhancement of the natural heritage of the Millennium Parklands.*

The SOPA Act is the overarching act that informs subsequent Sydney Olympic Park's planning procedures.

### 2.2 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and regulations are Australia's main national environmental legislation. They provide a way for Australia to protect and manage nationally and internationally important plants, animals, habitats and places.

Sydney Olympic Park is considered a hotspot for biodiversity, home to >250 species of native animals and plants (SOPA, 2025a). Sydney Olympic Park is a particular hotspot for migratory shorebirds. There are 37 species of migratory shorebirds that visit Australia each year, 12 of which have been regularly recorded at Sydney Olympic Park across the last 10 years.

The following threatened species and communities of Sydney Olympic Park are listed under the EPBC Act:

- Green and Golden Bell Frog (V),
- Sydney Turpentine Ironbark Forest (CE),
- Subtropical and Temperate Coastal Saltmarsh,
- Coastal Swamp Oak (*Casuarina glauca*) Forest of South-east Queensland and New South Wales (E)
- Listed migratory species are a matter of national environmental significance under the EPBC Act.

The above EPBC-listed threatened species and communities are considered matters of national environmental significance. Any action that has, will have, or is likely to have a 'significant impact' on a matter of national environmental significance will require approval under the EPBC Act. A 'significant impact' is defined as an impact that is important, notable, or of consequence, having regard to its context or intensity. This includes impacts to habitat that supports the survival of EPBC-listed threatened species and communities.

The EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species has been reviewed in order to form appropriate measures for development in areas close to migratory shorebird habitat (e.g. Newington Nature Reserve, Waterbird Refuge).

## 2.3 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the primary legislation for land use planning and development assessment in NSW. The EP&A Act provides a framework for planning, ensures development applications are assessed, and a basis for preparing environmental planning instruments (EPIs) such as State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).

If an environmental planning instrument provides that a development may not be carried out except with development consent, then the development must be assessed by the relevant consent authority in accordance with Part 4 of the EP&A Act (i.e. Development applications).

## 2.4 STATE ENVIRONMENTAL PLANNING POLICY (PRECINCTS— CENTRAL RIVER CITY) 2021

The *State Environmental Planning Policy (Precincts—Central River City) 2021* (CRC SEPP) provides provisions for Sydney Olympic Park. Specific provisions for Sydney Olympic Park are provided in "Appendix 4 State significant precinct – Sydney Olympic Park site" of the CRC SEPP. This section includes provisions for land use zones, height of buildings, floor space ratios, master plans, heritage conservation, demolition and more. These provisions describe when and where development consent is required.

Figure 3 shows the Environmental Conservation Areas map for Sydney Olympic Park under the CRC SEPP.



**Figure 3 Environmental Conservation Areas map (CRC SEPP)**

## 2.5 STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS) 2021

Chapter 2 of the *State Environmental Planning Policy (Resilience and Hazards) 2021* (R&H SEPP) contains the former *State Environmental Planning Policy (Coastal Management) 2018*. This chapter gives effect to

the objectives of the *Coastal Management Act 2016* from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal management area.

This chapter of the R&H SEPP maps a number of areas of coastal management areas including:

- Coastal Wetlands (and proximity area)
- Littoral Rainforest (and proximity area)
- Coastal Vulnerability Area
- Coastal Environment Area
- Coastal Use Area

Sydney Olympic Park contains significant portions of all the above mapped areas (excluding Littoral Rainforests) (Figure 5 and Figure 4).



**Figure 4 Coastal Wetlands and Proximity Area for Coastal Wetlands map (Source: NSW Planning Portal Spatial Viewer)**



**Figure 5 Coastal Use Area and Coastal Environment Area map (Source: NSW Planning Portal Spatial Viewer)**

## 2.6 BIODIVERSITY CONSERVATION ACT 2016

The Biodiversity Conservation Act 2016 (BC Act) is the NSW State level legislation that aims to protect threatened species or threatened ecological communities in NSW. The BC Act allows for the formal listing of threatened species and ecological communities based on scientific assessments of their risks of extinction.

Under Part 2 of the BC Act, it is considered an offence to:

- Harm animals – that are considered threatened species (under the BC Act), that are part of a threatened ecological community, a protected animal (in NSW)
- Pick (remove) plants – that are considered threatened species (under the BC Act), that are part of a threatened ecological community, a protected plant (in NSW)
- Damage a declared area of outstanding biodiversity value
- Damage habitat of a threatened species or ecological community

Development with potential direct or indirect impacts to threatened species, or ecological communities, listed under the BC Act will need to be determined and mitigation measures to minimise impacts to threatened species (or ecological communities).

### Biodiversity Values Map

The NSW Government's Biodiversity Values Map is part of the Biodiversity Offsets Scheme (BOS) formed under Part 6 of the BC Act. The map identifies land (or waters) which the State Government has identified as sensitive to the impacts associated with land clearing due to development.

If an area is mapped as 'Biodiversity Values' and vegetation clearing is proposed, then the Biodiversity Offsets Scheme is triggered and a Biodiversity Development Assessment Report (BDAR) must be completed for the works. The BDAR determines the impacts of land clearing on biodiversity and determine the amount of biodiversity credits to be offset.

Figure 6 provides a snapshot of the Biodiversity Values Map showing extents of the land under the control of Sydney Olympic Park.



**Figure 6 Biodiversity Values Map (Source: NSW Planning Portal Spatial Viewer)**

## 2.7 FISHERIES MANAGEMENT ACT 1994 (FM ACT)

One of the main objectives of the Fisheries Management Act 1994 (FM Act) is to conserve native fish stocks and 'key fish habitats'. Generally, key fish habitat include those habitats that are crucial to the survival of native fish stocks. The term excludes man-made habitats, such as agricultural drains and off-stream dams and ponds, and those natural waterways which are dry for the majority of the time or have limited habitat value.

Within Sydney Olympic Park, Haslams Creek, Narawang Wetlands, Badu Mangroves, Waterbird Refuge, Nuwi Wetland, Blaxland Riverside Park, Wilson Park, Triangle Pond in Wentworth Common and Newington Nature Reserve Wetland are mapped as 'Key Fish Habitat'. Sydney Olympic Park also has significant areas of mangrove forest and coastal saltmarsh in the aforementioned locations which are considered protected marine vegetation under the FM Act.

Under Part 4 of the EP&A Act, NSW DPI is a 'determining authority' for local development that requires a permit under the FM Act. A Section 205 permit is required for any works that would result in harm to marine vegetation. This includes works to cut, remove, damage, destroy or shading of saltmarshes, mangroves, seagrass and seaweeds. It is anticipated that this permit would be particularly relevant for works for new multistorey buildings given rise to by the Master Plan 2050 that could shade saltmarsh and mangrove forest.

Other development that may require a permit under the FM Act includes:

- aquaculture operations (including oyster cultivation)
- jetties, boat ramps and boat sheds

- bridges, culverts, causeways or other road crossings of waterways which require placing material on the bed of the waterway, obstructing the free passage of fish
- dams, weirs, floodgates, or levee banks across waterways
- marinas (e.g. if dredging or reclamation required)
- dredging navigation channels
- dredging for winning sand or gravel etc
- channelisation, relocation or realignment of watercourses
- installation of pipelines across waterways (if dredging or reclamation is required)
- stormwater outlets (if reclamation is required)
- stream bed or bank stabilisation works
- foreshore stabilisation (e.g. seawalls, retaining walls) where 'water land' may be filled or marine vegetation may be harmed
- boardwalks or walking tracks that cross intertidal areas, coastal wetlands, seaweeds or seagrasses



**Figure 7 Key Fish Habitat (Source: Fisheries Data Portal)**

# 3 EXISTING SOPA GUIDELINES, PLANS AND PROCEDURES

## 3.1 BIODIVERSITY MANAGEMENT POLICY

Sydney Olympic Park's Biodiversity Management Policy details how Sydney Olympic Park will manage biodiversity assets and comply with statutory obligations under environmental legislation, to ensure the long-term sustainability and survival of these biodiversity assets.

The purpose of the policy is:

*Protection and enhancement of the Park's biodiversity is a legislated function of Sydney Olympic Park Authority (the Authority) and is central to the 2050 Vision for Sydney Olympic Park to be Sydney's beating green heart.*

The Biodiversity Management Policy, policy statement is:

*Sydney Olympic Park will be managed to become Sydney's beating green heart, a nature-positive place with thriving ecosystems that form a significant piece of living infrastructure in Greater Sydney.*

Sydney Olympic Park will have committed to achieving the objectives of the Biodiversity Management Policy by:

1. Protect, nurture and value nature, to grow resilient urban ecosystems and meet statutory obligations for nature conservation
2. Green the Urban Centre, creating nature-positive urban areas that enhance ecological connections, enable positive human-centred interactions with nature and build a green legacy
3. Provide opportunities for people to connect with nature at scales and locations compatible with conservation objectives through environmental education, interpretive and experiential activities
4. Conduct ongoing on-ground ecological conservation and management works that heal and conserve the park's ecosystems into the future
5. Learn through ecological monitoring, robust citizen science programs and operational experience, and apply this knowledge in an adaptive management framework.
6. Apply technical ecological advice to Park development, use and activation programs:
  - o mainstream biodiversity considerations into decision-making that affects ecological systems
  - o protect and enhance core habitat areas and habitat linkages, with particular consideration of lands zoned for environmental conservation and management.
  - o avoid habitat loss, degradation, fragmentation or increased edge effects
  - o ensure no net loss of habitats for threatened or focal species; consider short and long-term impacts that may be direct, indirect or cumulative
  - o preserve 'dark areas' within ecologically-sensitive parklands habitats
7. Avoid or mitigate threats to nature including biosecurity risks, weeds, pest fauna, human disturbance, artificial night lighting, noise, shadowing, polluted stormwater runoff, non-target pesticide impacts, wildfire, climate change impacts and sea level rise.
8. Manage Newington Nature Reserve in accordance with requirements of the NSW National Parks & Wildlife Act 1974, and manage the lands adjoining it as a buffer to the Reserve and in sympathy with it to enable future additions to the reserve in accordance with requirements of the Sydney Olympic Park Authority Act 2001.
9. Provide ecological training for staff, contractors and volunteers working in sensitive areas.

### 3.2 BIODIVERSITY STRATEGY & MANAGEMENT PLAN 2022

The adopted *Biodiversity Strategy & Management Plan 2022* (BMP 2022) sets out how Sydney Olympic Park Authority will work towards the vision, exercising stewardship over the biodiversity assets in its care to ensure nature is protected, nurtured and valued.

The vision for Sydney Olympic Park described is to be Sydney's beating green heart, a nature-positive place with thriving ecosystems that form a significant piece of living infrastructure in Greater Sydney.

The BMP 2022 contains a summary of the existing ecological value of Sydney Olympic Park as well as outlining the strategy for managing biodiversity, which is built around four main strategic directions:

- Caring for nature
- Growing knowledge of nature
- Connecting people with nature
- Complying with nature laws

Within the 'caring for nature' strategic direction, the BMP 2022 includes the following broad goals managing biodiversity:

- Conserving the Green and Golden Bell Frog
- Regenerating remnant forest
- Growing bushland and grassland habitats
- Restoring estuarine ecosystems
- Sustaining healthy freshwater ecosystems
- Augmenting immature habitats
- Managing threats to species and ecosystems

The BMP 2022 identifies 13 focal species which are considered to have particular conservation significance for Sydney Olympic Park:

- Sydney Turpentine Ironbark Forest
- Green and Golden Bell Frog
- Coastal Saltmarsh and *Wilsonia backhousei*
- Mangrove Forest
- Swamp Oak Floodplain Forest
- Migratory shorebirds
- Latham's Snipe
- Woodland Birds
- Microbats
- Horned pondweed
- Red-rumped Parrot
- Raptors
- Black-winged Stilt

The targeted conservation management strategies for each of the focus species includes an outline of the conservation objectives, specific conservation actions, performance indicators, and identified local threats and pressures.

### 3.3 BIODIVERSITY MANAGEMENT ACTION PLANS AND MITIGATION MEASURES

Sydney Olympic Park has a comprehensive and leading best practice approach to management of biodiversity. This is documented in the adopted *Biodiversity Strategy & Management Plan 2022* (BMP 2022)

which provides action plans for each identified thirteen (13) focal communities and species. The action plans outline detailed actions plans responding to the specific objectives, threats and management requirements for reach species/community. This is outlined in detail in section 3.1 of the *Biodiversity Strategy & Management Plan 2022*. The action plans for each community are included below. Refer to the *Biodiversity Strategy & Management Plan* for further information on action plans for each of the thirteen focal communities/species.

### 3.1.1 Sydney Turpentine Ironbark Forest

#### Conservation Strategy - Sydney Turpentine Ironbark Forest



Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

##### Conservation objectives

1. Conserve and enhance the STIF community. Optimise species diversity, retain a mosaic of structural and age classes, and maintain low weed levels.
2. Improve the condition, structural diversity and species diversity of regenerating STIF within Newington Armory and Narawang Wetland through natural and assisted regeneration, and maximise connectivity with the Newington Nature Reserve wetland. Where possible, use local provenance material collected from the primary Newington Nature Reserve source in revegetation programs within a 300m radius of the Reserve to create a genetic and species buffer.
3. Encourage use of local provenance material in and around Sydney Olympic Park to promote local species and extend their distribution
4. Comply with rail safety legislation vegetation requirements, maintain fire trails, and maintain fuel reduction zones around built heritage items

##### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Maintain and implement a Habitat Management Plan and Fire Management Plan (in conjunction with NPWS).
3. Maintain a weed buffer on the lands surrounding the STIF community to minimise weed ingress.
4. Implement the relevant Standard Procedures from the Biodiversity Management Plan when conducting management activities.
5. Provide ecological induction training for staff and contractors working within Sydney Turpentine Ironbark Forest.
6. Implement hygiene practices to deter introduction of weed or disease organisms (including *Phytophthora cinnamomi*) into the forest community, and particularly into Newington Nature Reserve.
7. Continue to prohibit unmanaged public access to protect forest integrity.
8. Maintain a program of disturbance including mosaic burning and fire trail clearances to enhance the structural and age classes within the community.
9. Collect seed and propagative material from the forest, and salvage regenerating regionally significant flora species cleared from fire trails and asset protection zones for replanting within the Park.
10. Establish and interpret demonstration plantings of Sydney Turpentine Ironbark Forest species within the Park to promote community appreciation for local biodiversity.
11. Maintain records of all local provenance plantings.

##### Performance indicators

1. Trends in area and condition of Sydney Turpentine Ironbark Forest over time.
2. Flora species diversity.
3. Extent/number of fire dependant species in response to fire regime.

##### Local threats and pressures

1. Reduced resilience to natural and anthropogenic disturbance - due to fragmentation issues such as isolation, small size, restricted genetic diversity, high edge to area ratio, absence of some components of an intact community.
2. Senescence and/or windfall of mature canopy trees.
3. Weeds, pests and disease, and especially dieback caused by the fungus *Phytophthora cinnamomi*.
4. Inappropriate fire regimes; wildfire.
5. Uncontrolled public access; pressures for increased public access and lighting.

Conservation objectives

1. Conserve the Green and Golden Bell Frog population Park-wide as one meta-population with four sub-populations centred in the Brickpit, Kronos Hill/Wentworth Common, Narawang Wetland and Blaxland Riverside Park (including Wharf Pond and Wilson Park wetland).
2. Effective breeding populations are maintained in each sub-population.
3. All frog habitat is conserved and in good condition so that there is no net loss or degradation of habitat.
4. Maintain and enhance habitat connectivity between and within frog habitat areas, to facilitate movement and genetic exchange.

Conservation actions (page 1 of 2)

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage frog habitats in accordance with up to date Habitat Management Plans that address conservation objectives.
3. Implement the relevant 'Standard Procedure' (from the SOPA Biodiversity Management Plan, Part 3) when conducting management activities within frog habitats.
4. Provide ecological induction training for staff and contractors working within frog habitats.
5. Consider intervention if population parameters drop below 60% (as compared to 2012-13) in any sub-population. Parameters that may also trigger action include a lack of recruitment, a fall in occupancy or a decline in abundance. Potential action may involve captive breeding, overwintering of females or translocation of frogs or tadpoles within the Park to increase population size or vigour.
6. Actively manage frog habitat to provide a mosaic of habitat types for each subpopulation. Incorporate periodic disturbance, and water level management during the frog breeding season.
7. Participate in research and hosting/participating in workshops that will contribute to knowledge of GGBF habitat management.
8. Manage constructed habitat ponds and/or design new ponds to achieve:
  - Any new ponds to be of large size, or in close proximity to existing large wetlands;
  - retention of water for a minimum of 8 weeks;
  - a range of water depths including a minimum depth of 75 cm in part of the waterbody;
  - be unshaded between 10am and 4pm;
  - macrophytes covering 40% - 70% of the waterbody when the pond is full, with perimeter macrophytes being at least 1.5 metres wide where pond design permits;
  - contain shelter habitat such as rock piles;
  - free of *Gambusia*;
  - a perimeter zone of tall dense native grasses (over 30cm high) extending a nominal 5 metres from the pond edge, free of invasive exotic grasses (eg kikuyu, water couch);
  - *Typha* and *Phragmites* free (except as detailed in Habitat

Management plans for ponds A1, H4, VG2, EWQCP and CC7);

- linkage by movement corridors or foraging areas minimum of 25m wide to other ponds. Movement corridors to be dominated by tall dense grasses (over 30cm high) covering at least 70% of the nominated corridor.
9. Apply the following principles to routine habitat management activities:
    - Control weed outbreaks while small to prevent weeds forming habitat and consequential disturbance due to removal.
    - Within 5 metres of habitat ponds, vegetation greater than 1x1m is generally not to be cut, or sprayed with herbicide— more intensive works should be timed for when ponds are dry.
    - Manage mown lawns adjacent to frog habitat so as not to exceed 150mm between mowings.
    - Do not plant trees or allow them to grow (unless serving a screening or other function):
      - on the Brickpit floor (other than retained existing trees);
      - within 10 metres of the inner edge of the Brickpit rim;
      - within 3 metres of a habitat pond, or where they will cause excessive shading of a habitat pond when mature (particularly on the north or west of ponds);
      - within 10 metres of an underpass;
      - at a density that affects grassy understorey vegetation in frog habitats;
      - within 1 metre of a frog fence.
    - In other areas, plant trees and shrubs in scattered groups separated by dense groundcovers to maintain movement corridors.
    - Remove existing maturing trees where necessary to ensure habitat ponds receive a minimum of 6 hours direct sunlight across 80% of the pond to promote higher water temperatures and ensure optimum macrophyte growth. Control *Casuarina* spread through the removal of seedlings and clump creep.

Conservation strategy Coastal Saltmarsh and *Wilsonia backhousei*

Conservation objectives

1. No net loss of extent of Coastal Saltmarsh or *Wilsonia backhousei*, at precinct scales (based on 2013 mapping data).
2. Achieve a balance between mangrove, saltmarsh, Swamp Oak Floodplain Forest and mudflat habitats. Prevent saltmarsh from establishing on mudflats used by feeding/roosting shorebirds. Prevent mangrove or Swamp Oak Floodplain Forest from establishing in designated & mapped saltmarsh / mudflat conservation areas (as approved under Permit conditions).
3. Improve drainage of saltmarsh in Newington Nature Reserve 33 Marsh (subject to funding).
4. Conserve flora species diversity within the Coastal Saltmarsh community, including the following threatened and/or locally significant species: *Wilsonia backhousei*, *Lampranthus tegens* and *Tecticornia pergranulata*.
5. Avoid fragmentation or loss of condition of mapped Coastal Saltmarsh community by pathways, boardwalks or similar.

Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage the Coastal Saltmarsh community in accordance with up to date precinct Habitat Management Plans that incorporate Coastal Saltmarsh conservation objectives.
3. Implement standard procedures identified in the Standard Procedures for Biodiversity Management when conducting management activities within Coastal Saltmarsh.
4. Provide ecological induction training and supervision where necessary for staff and contractors working within Coastal Saltmarsh.
5. Deter and/or restrict access to lands containing Coastal Saltmarsh, installing signage, fencing and vegetation barriers to prevent uncontrolled access.
6. Maintain Coastal Saltmarsh extent in the Waterbird Refuge and Main Lagoon as mapped in 2013, through water level manipulation. Water levels to be maintained below 0.475mAHD in the Waterbird Refuge and above 0.625mAHD in the Main Lagoon.
7. Regularly remove mangrove and casuarina seedlings from designated saltmarsh conservation areas.
8. Maintain booms at key locations to control mangrove propagules and minimise smothering of Coastal Saltmarsh by stormwater and tidal debris.
9. Conduct regular sweeps for rubbish and other tidal debris deposited along Haslams Creek Flats.
10. Investigate opportunities to provide areas for saltmarsh retreat in response to sea level rise.
11. Maintain records of all local provenance plantings.

Performance indicators

1. Trends in the distribution, area and condition of Coastal Saltmarsh.
2. Trends in the area and condition of *Wilsonia backhousei* over time.
3. Maintenance of flora species diversity.

Local threats and pressures

1. Reduced resilience to natural and anthropogenic disturbance – due to fragmentation issues such as isolation, small size, restricted genetic diversity, high edge to area ratio, absence of some components of an intact community.
2. Uncontrolled public access; pressures for increased public access and lighting.
3. Invasion and displacement by weeds.
4. Shading and displacement by mangroves.
5. Altered hydrological regimes and changes to community composition and/or viability.
6. Sedimentation, erosion or smothering by tidal debris.
7. Pests and disease.
8. Trampling from uncontrolled public access, poorly briefed or supervised contractors.
9. Increased nutrient levels from stormwater discharge.
10. Impeded passage of fish and other aquatic fauna between the Coastal Saltmarsh and the Parramatta River.
11. Sea level rise.

## Conservation strategy - Mangrove forest

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Conserve the extent and condition of mangrove forest at Park and precinct scales in designated 'mangrove' areas.
2. Achieve a balance between mangrove, saltmarsh, Swamp Oak Floodplain Forest and mudflat habitats.
3. Avoid further fragmentation of the mangrove forest by pathways, boardwalks or similar.
4. Protect infrastructure including tidal flushing channels, fences, boardwalks, weirs, bird hides, pathways, radio towers, acid sulphate containment mound, shipwreck lookouts, bridges.
5. Maintain nominated existing view windows along the Parramatta River.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage the mangrove forest in accordance with up to date precinct Habitat Management Plans that address conservation objectives.
3. Implement standard procedures identified in the Biodiversity Management when conducting management activities within Mangroves.
4. Provide ecological induction training for staff and contractors working in mangroves.
5. Deter and/or restrict access to lands containing mangrove forest to formal paths and boardwalks and manage access through the installation of signage, fencing and vegetation barriers as required.
6. Maintain a suitable hydrological management regime for Newington Nature Reserve wetland and Badu Mangroves to ensure appropriate tidal flows for mangrove conservation. Water levels to be maintained below 0.475m AHD in the Waterbird Refuge and above 0.625m AHD in the Main Lagoon.
7. Progress holistic drainage plans for Badu Mangroves and Newington Nature Reserve - develop 2021 concept plans into detailed designs, and source funding for works.
8. Manage weirs and booms at Newington Nature Reserve, Waterbird Refuge and Haslams Creek Flats to minimise entry and/or spread of mangrove propagules.
9. Identify options to further stabilise the banks of Haslams Creek.
10. Mangrove control activities are undertaken as per a permit issued under the *Fisheries Management Act 1994*:
  - Periodically remove seedlings when they are less than 50cm height in areas designated as Coastal Saltmarsh and mudflat.
  - Apply formative pruning to extend the life of mature mangroves on the banks of Haslams Creek at risk of tree fall.
  - Selectively and minimally prune branches and pneumatophores of mature mangrove trees as required to protect the functioning of existing infrastructure including tidal flushing channels, fences, boardwalks, weirs, bird hides, pathways, radio towers, acid sulphate containment mound, shipwreck lookouts, bridges, seawalls.
  - Maintain mapped view corridors at the Parramatta River seawall by removing mangrove seedlings before they exceed 0.5 metres tall.
  - Obtain additional permits under the *Fisheries Management Act 1994* to remove or prune mangroves for activities not described above, in particular for capital works and parklands development projects.
11. Seek opportunities to increased knowledge of factors affecting mangrove health, such as albinism dieback

### Performance indicators

1. Trends in the area or condition of Mangrove Forest over time.
2. Trends in the extent or condition of River Mangroves over time.
3. Designated saltmarsh and mudflat conservation areas are free of mangroves.
4. Creeks and tidal flushing channels are unimpeded by mangrove growth.

### Local threats and pressures

1. Reduced resilience to natural and anthropogenic disturbance - due to fragmentation issues such as isolation, small size, restricted genetic diversity, high edge to area ratio, absence of some components of an intact community.
2. Altered hydrological regimes and changes to community composition and/or viability.
3. Trampling of pneumatophores & compaction of substrate from uncontrolled access.
4. Pressures for increased public access and lighting.
5. Shading from bridges and other infrastructure.
6. Increased nutrient levels from stormwater discharge.
7. Genetic damage eg albinism from exposure to past pollution.
8. Impeded passage of fish and other aquatic fauna between the mangroves of Newington Nature Reserve and the Parramatta River.
9. Climate change resulting in extreme sudden temperature changes and sea level rise.

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## Conservation strategy - Swamp Oak Floodplain Forest

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Conserve and protect the extent and condition of Swamp Oak Floodplain Forest at Park and precinct scales.
2. Achieve a balance between mangrove, saltmarsh, Swamp Oak Floodplain Forest and mudflat habitats.
3. Prevent over-shadowing of Wharf Pond by Swamp Oak Floodplain Forest.
4. Maintain a mosaic of structural and age classes within the community.
5. Maintain current low weed levels.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage Swamp Oak Floodplain Forest in accordance with an up to date Habitat Management Plan that addresses estuarine vegetation conservation objectives.
3. Implement standard procedures identified in the Standard Procedures for Biodiversity Management when conducting management activities within Swamp Oak Floodplain Forest.
4. Provide ecological induction training for staff and contractors working within Swamp Oak Floodplain Forest.
5. Deter and/or restrict access into lands containing Swamp Oak Floodplain Forest to minimise trampling.
6. Maintain a suitable hydrological management regime for Newington Nature Reserve wetland to achieve balance between the conservation of Coastal Saltmarsh and Swamp Oak Floodplain Forest. As at 2013, water levels are maintained above 0.625m AHD in the Main Lagoon.
7. Maintain records of all local provenance plantings.

### Performance indicators

1. Trends in the area and condition of Swamp Oak Floodplain Forest.
2. The community and its component species is being promoted and extended in balance with other estuarine vegetation communities.
3. Implementation of identified management actions.

### Local threats and pressures

1. Reduced resilience to natural and anthropogenic disturbance - due to fragmentation issues such as isolation, small size, restricted genetic diversity, high edge to area ratio, absence of some components of an intact community.
2. Senescence and windfall of mature canopy trees.
3. Altered hydrological regimes and changes to community composition and/or viability.
4. Increased nutrient levels from stormwater discharge.
5. Sedimentation and erosion.
6. Weeds, pests and diseases, particularly *Juncus acutus* and common couch *Cynodon dactylon*.
7. Exposure to acid sulphate soils.
8. Wildfire.
9. Uncontrolled public access; pressures for increased public access and lighting.

## Conservation Strategy - Migratory Shorebirds

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. The Waterbird Refuge and Newington Nature Reserve provide high quality habitat for migratory shorebirds – in terms of habitat features and management of threats.
2. Sydney Olympic Park supports a high proportion of the Bar-tailed Godwits recorded within the Parramatta River estuary each summer.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage the Waterbird Refuge and Newington Nature Reserve wetland in accordance with up to date precinct Habitat Management Plans that address conservation objectives.
3. Install 2 additional bird roosts within WBR to increase safe roost sites.
4. Manage vegetation and water levels within Main Lagoon and Waterbird Refuge to ensure:
  - water levels are maintained below 0.475m AHD in the Waterbird Refuge and above 0.625m AHD in the Main Lagoon between September and March;
  - saltmarsh and mudflat conservation areas are mangrove-free;
  - unvegetated mudflats are conserved;
  - sightlines are maintained and existing pathways are shielded from human disturbance ;
  - screening is enhanced on the eastern side of the Waterbird Refuge and the western side of Main Lagoon.
4. Minimise activities that cause disturbance, noise or light impacts to Newington Nature Reserve wetland and the Waterbird Refuge. Maintain pathways adjacent to these areas as unlit.
5. Provide ecological induction training for staff and contractors working within and near migratory shorebird habitat.
6. Deter and/or restrict public access within and adjacent to migratory shorebird habitats, other than at designated screened viewing points. Maintain the southern end of the Waterbird Refuge as closed to public access.
7. Implement cat, fox and off-lead dog management programs. Continue to prohibit dogs from pathways adjacent to the Waterbird Refuge.
8. Liaise with researchers / other land managers to compare population trends across the flyway.

### Performance indicators

1. Numbers and diversity of migratory shorebirds show a steady trend:
  - 90% of the Parramatta River estuary population of Bar-tailed Godwits are recorded at Sydney Olympic Park each season.
  - Number of species recorded Park-wide.
2. Migratory shorebird habitat in the Waterbird Refuge and Newington Nature Reserve wetland is in good condition.

### Local threats and pressures

1. Inadequate habitat quantity or quality; habitat fragmentation.
2. Inappropriate hydrological regimes during September to March.
3. Loss of mudflat and saltmarsh habitats as a result of mangrove encroachment.
4. Reduction of sight lines due to growth of mangroves & casuarinas close to feeding and roosting sites.
5. Relative loss of mudflats due to saltmarsh encroachment.
6. Trampling and disturbance by contractor access to habitats.
7. Trampling and disturbance due to off-path public access; nocturnal access to Waterbird Refuge and Newington Nature Reserve and surrounds.
8. Pressures for increased public access, noise and lighting.
9. Disturbance by dogs.
10. Predation by foxes and cats.
11. Reduction of food abundance due to reduced water quality.

## Conservation Strategy – Latham’s Snipe

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Population of Latham’s Snipe at a Park wide scale is maintained at 12-14 individuals or greater;
2. Provision of high quality Latham’s Snipe habitat at Narawang Wetland, Eastern Pond, Northern Water Feature and the Brickpit.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage Narawang Wetland, Eastern Pond, Northern Water Feature and the Brickpit in accordance with up to date precinct Habitat Management Plans, that address conservation objectives.
3. Minimise management and visitation activities within freshwater wetland habitats between September and March to minimise disturbance to Latham’s Snipe.
4. Provide ecological induction training for staff and contractors working within Latham’s Snipe habitat.
5. Scheduling of the annual cyclic draining program in Narawang Wetland to ensure that:
  - Pond draining is undertaken in August where possible, prior to arrival of snipe;
  - Two thirds of the wetland is available as foraging and refuge habitat.
6. Maintain pond levels at full/overflowing in at least two pond clusters in Narawang Wetland between August and March to create marshy foraging habitats.
7. Deter access to Latham’s Snipe habitats. Install signage, fencing and vegetation barriers as required to prevent uncontrolled access. Avoid further fragmentation of Narawang Wetland by new or intensified pathways or lighting.
8. Implement cat, fox and off-lead dog management programs within Narawang Wetland.
9. Liaise with other researchers/land managers to compare population trends between sites across the flyway/region.

### Performance indicators

1. Population of Latham’s Snipe at a Park wide scale is maintained at 12-14 individuals or greater.
2. Latham’s Snipe habitat in Narawang Wetland is in good condition.

### Local threats and pressures

1. Inadequate quantity or quality of roosting or foraging habitat; habitat fragmentation.
2. Insufficient water levels within freshwater bodies September to March.
3. Trampling and disturbance by off-path public access, contractor access; nocturnal access to Narawang Wetland.
4. Pressures for increased public access and lighting.
5. Disturbance by off-lead dogs; predation by foxes and cats.

## Conservation Strategy – Woodland birds

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Woodland bird species diversity and abundance is retained and enhanced at a Park scale (compared with 2010 survey data).
2. Increased extent and connectivity of woodland bird habitat (compared with 2007 when the shrub planting strategy was initiated).
3. Weedy areas providing woodland bird habitat are progressively replaced with native species of similar habitat value.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage Parklands precincts and the Boundary Creek system in accordance with up to date precinct Habitat Management Plans that address conservation objectives.
3. Continue to enhance the extent, quality and connectivity of woodland bird habitat in suitable parklands precincts - including shrub planting, thinning of trees and infill planting to achieve >40% canopy cover located in the shrub layer 1-8m high, and an open tree canopy less than 30%. Ground cover layer to be a mix of grasses/ sedges, and fine and coarse mulch, including fallen branches.
4. Improve woodland bird habitat quality and extent at Blaxland Riverside Park in accordance with development consent conditions.
5. Actively consider woodland bird habitat requirements in future planting programs across Sydney Olympic Park. Through appropriate landscape design, avoid creating low structure, eucalyptus dominated habitat favoured by Noisy Miners.
6. Seek opportunities to reduce edge ratios through the linking of habitat patches to create corridors or larger habitat areas.
7. Continue to stage remove stands of woody weeds in Triangle Pond and Wilson Park Wetland. Only progress to the next stage when monitoring shows that new replacement plantings are being utilised by birds. Do not remove large stands of woody weeds during the peak bird breeding season (July to November). Remove new woody weeds before they become established (before they exceed 2x2m).
8. Avoid fragmentation of existing woodland bird habitats by new pathways, lighting or similar.
9. Provide ecological induction training for staff and contractors working within woodland bird habitats.
10. Deter access to woodland bird habitats. Install signage, fencing and vegetative barriers as required to prevent uncontrolled access.
11. Implement cat, fox and off-lead dog management programs.

### Performance indicators

1. Trends in woodland bird species diversity and abundance over time.
2. Extent of suitable habitat across the Parklands over time.
3. Trends in breeding occurrence/evidence over time.

### Local threats and pressures

1. Low viability of the local population of some species due to small size, isolation, restricted genetic diversity, small area of available habitat.
2. Habitat modification, fragmentation or removal – through maturation of planted tree saplings, removal of weedy habitat without replacement, changed public usage patterns, installation of new pathways through existing habitats.
3. Small extent of high-quality woodland bird habitat in landscaped parkland areas; low connectivity between habitats.
4. Competition with and displacement by the aggressive behaviour of the Noisy Miner.
5. Nest predation by larger birds including Grey Butcherbird, Pied Currawong and Australian Magpie.
6. Disturbance to birds, and damage to habitat including nest sites by uncontrolled public access, off-lead dogs, or inappropriate authorised access.
7. Pressures for increased public access, noise and lighting.
8. Predation by introduced species such as foxes, cats and rats.

## Conservation Strategy – Microbats

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Microchiropteran species diversity and abundance is retained at a Park scale.
2. Conserve and minimise disturbance to known and potential microbat roost sites within Newington Armory buildings.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Afford a high level of protection and consideration to the White-striped Free-tailed bat *Austronomus australis* maternity roost at Building X at Newington Armory.
3. Protect known roost sites under bridges and culverts and ensure they are considered during programming of maintenance works.
4. Implement Standard Procedure 07 *Microbat roosts: bridges, culverts and buildings* when planning or conducting activities, maintenance or development at sites likely to provide roost habitat for microbats.
5. Install rat baits within Newington Armory buildings currently or recently used by bats.
6. Retain mature and dead trees wherever possible, particularly trees containing hollows.
7. Control feral honey bees at infested roost boxes and hollows.
8. Enhance habitat where degraded or structurally simple by planting a mix of appropriate forest/woodland tree, shrub and groundcover species.
9. Avoid lighting or lit activities within or near Dark Zones (see Map 21 Dark Areas, Page 64) and particularly near known roosts (see Map 20 Known microbat roosts, Page 64).
10. Expand the bat box program from 24 roost boxes to 40 by 2024 and include new designs for species not currently active in boxes (4 species as at 2021).
11. Provide ecological induction training for staff and contractors working within/near microbat habitat, particularly roost sites.

### Performance indicators

1. Trends in microbat species diversity and abundance over time.
2. Maintenance of/increase in the number of known or potential roost and foraging sites.
3. Numbers recorded at the White-striped Free-tailed Bat maternity roost over time.

### Local threats and pressures

1. Viability of local populations due to small size, isolation, restricted genetic diversity, small area of available habitat, intra-species competition for habitat resources.
2. Changes in habitat structure or extent of feeding or roosting areas.
3. Changes to insect populations as a result of changes to insect habitat – eg vegetation, pest control, lighting.
4. Loss, interference or disturbance to roosts.
5. Loss of mature trees (containing hollows or decortifying bark) due to windfall or death and removal as part of Park maintenance.
6. Competition for tree hollows.
7. Inappropriate lighting at roost sites.
8. Pressures for increased public access (particularly nocturnal access & access to or near roost sites), noise and lighting.
9. Predation by rats, cats and foxes.
10. Pesticide application in or adjacent to foraging areas; inappropriate use of pesticides near roost sites.

## 10.3 Conservation Strategy – Horned Pondweed *Zannichellia rupestris*



Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Conserve known population of *Zannichellia palustris* at Bennelong Pond.
2. Maintain current low weed levels.
3. Minimise changes to pond hydrology due to catchment changes.
4. Increase understanding of *Zannichellia palustris* ecology.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage Bennelong Pond in accordance with an up to date Habitat Management Plan that addresses conservation objectives.
3. Manage any activity in Bennelong Pond that may cause turbidity, sedimentation, water level changes, or otherwise affect *Zannichellia palustris*.
4. Provide ecological induction training for staff and contractors working within areas where *Zannichellia palustris* is known.
5. Maintain a suitable hydrological management regime for Bennelong Pond to achieve balance between the conservation of *Zannichellia palustris* and other functions of the pond including stormwater, mangrove protection and fauna. In particular:
  - Where rainfall allows, manipulate the weir to maintain the pond water level between 0.975m and 1.175m AHD to suit *Zannichellia palustris* viability as well as facilitate education activities.
  - In the event of prolonged drought and possibility of complete drying out of Area 1, manually water Area 1.
  - Investigate opportunities to improve the pond inlet capacity to better accommodate stormwater and control excess turbidity and sediment loads.
6. Plan and conduct dredging works to Boundary Creek in a manner that promotes continued viability of the *Zannichellia* population.

### Performance indicators

1. There is no net loss in the coverage of *Zannichellia palustris* in Bennelong Pond.
2. *Zannichellia palustris* health and vigour is not significantly deteriorated for more than two consecutive growing seasons.

### Local threats and pressures

1. Changes to stormwater flows leading to changes in hydrological conditions and water quality such as increased sedimentation, turbidity and nutrient loads.
2. Shading of water by mangroves or emergent macrophyte species.
3. Uncertainties due to lack of knowledge about species ecology.
4. Competition from introduced pests and disease.
5. Saltwater intrusion through high tides, failure of the bund wall, climate change.
6. Water level manipulation for infrastructure maintenance impacting adversely on the population.

## Conservation Strategy – Red-rumped Parrot *Psephotus haematonotus*

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

### Conservation objectives

1. Conserve known population of Red-rumped Parrots.

### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives
2. Manage Park habitats to ensure breeding requirements of Red-rumped Parrots are met:
  - I. Retain mature and dead trees wherever possible, particularly trees containing hollows;
  - II. Inspection of Red-rumped Parrot nest boxes to be conducted on a regular basis. Visual monitoring during the breeding season (August-November) to assist in understanding preferred nest box design and placement;
  - III. Monitor disturbance levels at breeding areas and restrict access to core breeding habitat of Newington Nature Reserve;
  - IV. Expand nest box program to provide greater breeding opportunities.
3. Implement a pest animal control program to reduce predation pressure from species such as foxes, cats and rats.

### Performance indicators

1. Trends in Red-rumped Parrot population over time.
2. Trends in nest box use over time.

### Local threats and pressures

1. Competition for tree hollows with other species.
2. Loss of hollows through windfall or death of trees.
3. Disturbance at breeding or feeding sites.
4. Eating turf grasses sprayed with herbicide.

### 3.1.12 Raptors



Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

#### Conservation Strategy - Raptors

##### Conservation objective

1. Conserve and enhance raptor diversity and abundance at Sydney Olympic Park.

##### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Provide high level of protection and consideration to the White-bellied Sea-Eagle nest in Newington Nature Reserve.
3. Restrict access to nesting sites where possible and minimise disturbance (and human safety risk posed by territorial birds) by imposing seasonal restrictions. Schedule activities such as weed control and prescribed burning outside of nesting seasons.
4. Protect and preserve potential roost and nest sites by retaining mature trees and dead stags.
5. Retain a range of raptor habitats at a Park-scale including open grasslands, and structurally diverse woodlands.
6. Avoid fragmentation of existing raptor habitats by new pathways or similar.
7. Liaise with owners of artificial structures such as communication towers that may from time to time form potential nest sites.
8. Manage pest control programs to minimise secondary poisoning in raptors – use products that require multiple meals to be effective. Do not place baits in open areas away from structures.
9. Monitor raptor populations to detect change in status and response to management actions.

##### Performance indicator

1. Trends in raptor abundance, diversity and breeding over time.

##### Local threats and pressures

1. Pesticide poisoning due to secondary consumption and pesticide accumulation.
2. Disturbance at breeding or feeding sites by inappropriate access.
3. Uncertainties due to lack of knowledge.
4. Pressures for increased public access, noise and lighting, use of drones.
5. Clearing or degradation of habitat.
6. For the White-bellied Sea-Eagle: Increased mortality due to entanglement in discarded fishing gear, and entanglement in fish farm nets
7. Competition for, and interference at nests by overabundant ravens, currawongs and cockatoos.
8. Parasites and disease such as Newcastle disease (paramyxovirus) found in domestic and feral pigeons (pigeons are prey for many raptor species).

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#### Conservation Strategy –Black-winged Stilt *Himantopus himantopus*

Sydney Olympic Park | Biodiversity Strategy & Management Plan 2022

##### Conservation objectives

1. Park-wide Black-winged Stilt abundance retained or increased above 2010 levels.
2. Black-winged Stilt breeding increase above 2010 levels.

##### Conservation actions

1. Provide for environmental education and interpretation activities at scales and locations compatible with conservation objectives.
2. Manage Park wetlands in accordance with up to date precinct Habitat Management Plans that address conservation objectives.
3. Minimise management activities within wetlands during the breeding season (September – December) to minimise disturbance.
4. Increase extent of emergent macrophytes in the Northern Water Feature.
5. Maintain constructed breeding habitat (fixed and floating islands) for Black-winged Stilts in the Waterbird Refuge.
6. Maintain a suitable hydrological management regime for all wetlands to achieve balance between the conservation of habitat for waterbirds and other wetland functions.
7. Provide ecological induction training for staff and contractors working within wetlands.
8. Implement cat, fox and off-lead dog management programs.

##### Performance indicators

1. Trends in Black-winged Stilt distribution and abundance.
2. Trends in numbers of nesting sites.

##### Local threats and pressures

1. Wetland habitat loss, degradation or fragmentation.
2. Predation by foxes and cats.
3. Disturbance by off-lead dogs, inappropriate public access or contractor access to habitats.
4. Inappropriate hydrological regimes particularly during the breeding season; September-December, leading to inundation of nesting sites.
5. Reduction of food abundance due to reduced water quality.

Section 3.2 of the Biodiversity Management Plan includes specific measures to address impacts from threats and pressures. These include the following:

<p>Edge effects and fragmentation</p>	<p><b>Threat abatement measures</b></p> <p><b>Objective:</b> maintain ecological integrity of habitats</p> <ul style="list-style-type: none"> <li>• Avoid further fragmentation of large or significant areas of vegetation by new pathways or similar</li> <li>• Maintain, manage and where feasible extend buffer zones around areas supporting priority species and communities</li> <li>• Continue the habitat enhancement program to enhance structural complexity and species diversity by: <ul style="list-style-type: none"> <li>○ Plant a shrub and grass understorey</li> <li>○ Retain fallen logs and branches</li> <li>○ Ensure all new plantings avoid the creation of narrow corridors of trees without understorey and midstorey layers.</li> </ul> </li> </ul>
<p>Disturbance</p>	<ul style="list-style-type: none"> <li>• Restrict off-path access to habitats.</li> <li>• Avoid further fragmentation of 'core' habitats in Park development projects.</li> <li>• Restrict access to habitats after dark.</li> <li>• Screen sensitive habitats from high activity areas and pathways.</li> <li>• Require dogs to be on-lead in all but designated areas; prohibit access by dogs in highly sensitive areas.</li> <li>• Provide hides at high-visitation wetland viewing areas.</li> <li>• Promote use of EagleCAM and similar interpretive tools, that do not require public access to sensitive areas</li> </ul>

Noise	<p><b>Threat abatement measures</b></p> <p><b>Objective:</b> Avoid noise impacts to fauna</p> <ul style="list-style-type: none"> <li>• Locate, plan and manage events to avoid noise impact on areas of high fauna habitat value.</li> </ul>
Artificial lighting	<p><b>Threat abatement measures</b></p> <p><b>Objective:</b> avoid impacts of artificial night lighting to fauna.</p> <ul style="list-style-type: none"> <li>• Ensure external lighting complies with the 'best practice lighting design principles' detailed in the <a href="#">National Light Pollution Guidelines for Wildlife</a>. Use warm-spectrum (&lt;3000k) lighting with little or no short wavelength (400 – 500 nm) violet or blue light. Check with the Australasian Dark Skies Alliance for suppliers.</li> <li>• Ensure the location and design of lighting avoids impacts on areas designated as Dark Zones (see drawing 001GG0458). Lighting in or near these areas should be avoided.</li> <li>• The starting point for all lighting designs should be natural darkness. Artificial light should only be added for specific and defined purposes, and only in the required location and for the specified duration of human use.</li> <li>• Light only the intended object or area - keep lights close to the ground, directed and shielded. Avoid upward floodlights to illuminate buildings, bridges, billboards and monuments. Avoid use of upward searchlights as 'event markers'.</li> <li>• Where LED smart control technology is available, deploy controls such as dimming, time or motion based trigger for lighting.</li> <li>• Conduct an annual light spill survey to identify spill into Dark Zones and other habitats; address lightspill where possible.</li> </ul>

### 3.4 DRAFT BIODIVERSITY MANAGEMENT PLAN 2025

The BMP for Sydney Olympic Park is updated every 3 years. The DRAFT *Biodiversity Management Plan 2025* (BMP) outlines how Sydney Olympic Park will mitigate the potential impacts presented by the urbanised environment of Sydney Olympic Park including competing land uses, invasive species and diseases, and a changing climate.

The BMP provides conservation strategies and environmental procedures that aim to support the long-term survival of Sydney Olympic Park's existing high ecological value assets.

The BMP includes background, management directions, specific adaptive management activities to be undertaken and ecological indicators of success for the following seven conservation management programs, which include the seven described in above in the BMP 2022.

The BMP also includes targeted conservation management strategies to be applied for thirteen "focus species" that are of particular conservation significance. Sydney Olympic Park's focus species (or communities) in the draft BMP 2025 are identical those included in the BMP 2022. The targeted conservation management strategies for each of the focus species includes an outline of the conservation significance and management, conservation objectives, specific conservation actions, ecological indicators, identified local threats and pressures.

The BMP responds to relevant State and Federal legislation, including the *NSW Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*.

### 3.5 ENVIRONMENTAL GUIDELINES FOR SYDNEY OLYMPIC PARK 2008

The *Environmental Guidelines for Sydney Olympic Park 2008* (SOPA Environmental Guidelines) are the guidelines that aim to implement the Environmental Policy of the Sydney Olympic Park Authority with regards to the care, control, management, and development of Sydney Olympic Park. The SOPA Environmental Guidelines were prepared under the SOPA Act.

The principal objective of the SOPA Environmental Guidelines is to set out a general scheme of environmental issues and commitments that aim to implement the Environmental Policy of the Sydney Olympic Park Authority with regards to the care, control, management, and development of Sydney Olympic Park.

The Environmental Guidelines apply to the whole of the land identified as Sydney Olympic Park in the Sydney Olympic Park Act. In accordance with Section 20 of the SOPA Act the Authority must before carrying out any proposed development, consider whether the proposed development is consistent with the Environmental Guidelines. Section 18 of the SOPA Act requires the Authority to prepare and maintain a Master Plan for Sydney Olympic Park that is consistent with the Environmental Guidelines.

The SOPA Environmental Guidelines are not prescriptive in the sense of rigidly specifying actions that must be taken and they do not attempt to address all environmental issues. Rather, they focus on:

- highlighting key environmental issues for Sydney Olympic Park
- defining the major challenges these issues present to SOPA
- various commitments that SOPA has made to progressively enhance the sustainability of Sydney Olympic Park

As such the SOPA Environmental Guidelines provide an important reference point for:

- (a) planners, developers, event owners and place managers to test the quality and relevance of their environmental sustainability effort at Sydney Olympic Park and
- (b) assessment and consent authorities to check the adequacy of development and operational proposals at Sydney Olympic Park in terms of potential to enhance environmental sustainability outcomes

### 4.7 Biodiversity

Sydney Olympic Park's Biodiversity Objectives as per section 4.7 of the SOPA Environmental Guidelines are:

*(a) Protecting and enhancing the natural heritage and ecological integrity of Sydney Olympic Park – targeting priority species and communities, places of high biodiversity value, and biodiversity generally;*

*(b) Applying an adaptive management approach to stewardship of Sydney Olympic Park's biodiversity assets;*

*(c) Ensuring conservation of biological diversity and ecological integrity is a fundamental consideration for new developments, activities, levels or types of use, or management practices that affect the ecosystems of Sydney Olympic Park;*

*(d) Promoting the ecological, aesthetic and educational value of an urban site with high species diversity and abundance;*

*(e) Conserving and enhancing the remnant woodland and wetland habitats of Newington Nature Reserve in accordance with the Newington Nature Reserve Plan of Management, and managing adjoining lands in sympathy with the Reserve; and*

*(f) Maximising the habitat values of native plantings by promoting priority species and communities, providing structural complexity and plant species diversity, avoiding habitat fragmentation; promoting habitat linkages and large core areas; and prioritising the use of indigenous species in landscape planting schemes in the Parklands.*

Proposed development carried out due to implementation of the Master Plan 2050 will be assessed to ensure alignment with the objectives (a-f, above) for biodiversity as per the SOPA Environmental Guidelines.

### 3.5.1 SOPA ENVIRONMENTAL MANAGEMENT SYSTEM

Sydney Olympic Park's Environmental Management System (EMS) has been developed for use by its personnel, contractors and key stakeholders as a means of helping Sydney Olympic Park achieve its commitment to Ecologically Sustainable Development. The Environmental Management System provides the management framework through which the Sydney Olympic Park will:

- Comply with all relevant State and National statutes and international biodiversity conservation treaties
- Provide a systematic approach to managing the environmental impacts of its activities, projects and maintenance programs
- Manage environmental risks through risk reduction strategies and contingency planning
- Provide environmental awareness and procedures training for staff and contractors
- Share environmental knowledge and experience with others
- Continually improve its environmental performance
- Report on its environmental performance through statutory and non-statutory reporting and information exchange forms
- Implement the Parklands Plan of Management to deliver a best practice approach in adaptive parkland management

The EMS describes how Sydney Olympic Park will manage its environmental affairs and continue to meet, and improve on its Ecologically Sustainable Development performance.

## 3.6 PLAN OF MANAGEMENT FOR THE PARKLANDS AT SYDNEY OLYMPIC PARK (2010)

The *Plan of Management for the Parklands at Sydney Olympic Park (2010)* (Parklands Plan) outlines how the various parklands of Sydney Olympic Park are to be managed into the future. The Parklands Plan was prepared under the s. 34 (1) of the SOPA Act, a legally binding document that was gazetted in NSW Parliament. Parklands Plan contains management objectives for the whole of the Parklands which includes the following key environmental areas:

- Bicentennial Park,

- Wetland areas south of Homebush Bay,
- Newington Nature Reserve,
- Parts of the former Royal Australian Navy Armament Depot,
- the former State Brickworks,
- the lower reaches of Haslams Creek,
- the remediated waste mounds of Kronos Hill and Woo-la-ra,
- Archery Park,
- Wilson Park sportsgrounds,
- Blaxland Riverside Park
- Wentworth Common

Refer to Figure 8 for a map of the land included in the Parklands Plan.



### 3.6.1 PUBLIC ACCESS & LAND USE REGIME – CONSERVATION AREAS

Part 2 'Public Access & Land Use Regime' defines the various public uses allowed and those uses not permitted in the different areas of the Parklands, and the terms under which those uses may occur.

The Parklands Plan identifies that Conservation areas are reserved for conservation of native flora and fauna species, communities and their habitat while also accommodating leisure and learning activities, and similar uses by the public.

The following sections are relevant to the management of conservation areas of Sydney Olympic Park:

#### 2.13 'Purpose of Conservation Areas (LG.A 36 (3A)(b)(i))'

The purpose for which Conservation Areas within the Parklands have been reserved is to:

*Conserve native flora and fauna species, communities and their habitat while also accommodating leisure and learning activities and uses by the public that typically are passive in nature; are low-impact on the environment; focussed on observing and appreciating nature or may relate to personal health and fitness or rest and relaxation.*

Sydney Olympic Park's role in managing conservation areas is to:

- conserve biodiversity and maintain ecosystem function;
- provide habitats for native species;
- protect the important ecological, geological, geomorphologic, historical or scenic features of the land;
- while also providing for appropriate public use of and access to the land, its facilities and features

#### 2.15 'Approved Public Uses for Conservation Areas (LG.A 36(3)(d))'

This section of the Parklands Plan provides a table of approved public uses for areas in Sydney Olympic Park that identified as Conservation Areas.

An **Approved Public Use** within a Conservation Area may be undertaken without the written approval of the Authority.

A **Restricted Public Use** within a Conservation Area requires prior Approval which may allow the use subject to specified terms and conditions.

A **Prohibited Public Use** within a Conservation Area is not allowed and will not be approved by the Authority.

**Table 1 Schedule of Public Use Controls for Conservation Areas (Parklands Plan – TABLE 3)**

<i>Approved Public Uses</i>	<i>Restricted Public Uses</i>	<i>Prohibited Public Uses</i>
<i>These are Appropriate Uses and NO Permit is Required.</i>	<i>These are Uses with Limitations and A Permit is Required.</i>	<i>These are Inappropriate Uses and No Permit is available.</i>
<i>[NOTE: the nature and extent to which these uses will be appropriate will be affected by the provisions, constraints and obligations referred to in the Management Framework Part 3].</i>		Any use other than an Approved Public Use that has not been approved by the Authority in writing.
Nature study uses - including bird-watching; natural history; wildlife observation; self-guided nature tours; participation in ranger walks and talks, volunteer training sessions and school education excursions and drawing, painting and photography.  <i>[These uses must only take place within mown-grass areas, shelters, viewing areas, hides, board-walks, platforms, or formed pathways]</i>	Access to Enclosed Lands, and all uses and activities referenced in Part 2 Clause (4) of the SOPA Regulations 2007 (see <b>Appendix 4.1</b> )	Unauthorised uses that are likely to harm native flora, fauna or trees; damage landscapes, facilities, buildings, or park furniture; pollute the environment; interfere with the reasonable well-being or enjoyment of other visitors or create health, safety or security hazards.  Driving vehicles other than on formed roads or parking vehicles other than in marked bays.
Low impact leisure uses - including walking; personal fitness and exercise; running; cycling; resting; meditating; painting; writing and reading.  <i>[These uses must only take place within mown-grass areas, shelters, viewing areas, hides, board-walks, platforms, or formed pathways]</i>	Low impact uses in sensitive areas - including small public events; weddings; readings; displays; orienteering; portable exhibitions; temporary structures; scientific research; organised student activities; organised fun runs and walks on defined pathways and discharge of fireworks.	High impact uses - including races, team competitions; musical performances; festivals; circuses; shows or hang-gliding; the riding of horses; Mountain X and BMX cycling activities; use of motorised craft; use of wind propelled craft and overnight camping.
On-leash dog exercise at Kronos Hill ONLY.	Commercial uses of any kind - including ecotourism; provision of food, beverages or merchandise; filming and photography; advertising and promotions.	Inappropriate uses - including the lighting of fires; use of outdoor lighting; exercise of domestic animals; amplified music; or flying of kites, balloons or model aircraft.

### 3.6.2 PUBLIC ACCESS & LAND USE REGIME – WETLANDS AND WATERWAYS

Similar to the previous section regarding Conservation Areas, this section identifies the management of public access and use with reference to Sydney Olympic Park’s Wetlands and Waterways.

#### 2.16 ‘Purpose of Wetlands & Waterways (LG.A 36 (3A)(b)(i))’

The purpose for which Wetlands & Waterways within the Parklands have been reserved is to:

*Conserve wetland ecological processes and habitat values while also accommodating leisure and learning activities and uses by the public that typically are passive in nature; are low-impact on the environment; do not involve physical access into the water; are focussed on observing and appreciating nature; or may relate to personal health and fitness or rest and relaxation.*

Sydney Olympic Park’s role in managing conservation areas is to:

- *conserve biodiversity and maintain ecosystem function of the wetlands and*
- *maintain, restore and regenerate the land, its features and habitat, in a natural state and setting while also*
- *providing for appropriate community use of and access to the land, its facilities and features*

#### 2.17 'Objectives for Wetlands & Waterways (LG.A 36(3)(b))'

The management objectives for land categorised as Wetlands & Waterways in this section of the Parklands Plan are as follows:

- (a) preserve and enhance the health and function of ecological systems and hydrological regimes;*
- (b) provide for community use of and access to the land in such a manner as will minimise and mitigate any significant disturbance;*
- (c) facilitate opportunities for visitors to observe and learn about the large numbers and species of birds and their habitat in the wetlands;*
- (d) not exceed optimal use levels which reflect a balance between the impact on species and habitat, the physical limitations on access, the resilience of wetland areas, and the sustainability of particular activities; and*
- (e) promote management and use of the land in a manner that protects and enhances the conservation, heritage, landscape and biodiversity quality of the land for present or future generations.*

#### 2.18 'Approved Public Uses for Wetlands & Waterways (LG.A 36(3)(d))'

This section of the Parklands Plan provides a table of approved public uses for areas in Sydney Olympic Park that identified as Wetlands & Waterways.

An **Approved Public Use** within a Wetlands & Waterways may be undertaken without the written approval of the Authority.

A **Restricted Public Use** within a Wetlands & Waterways requires prior Approval which may allow the use subject to specified terms and conditions.

A **Prohibited Public Use** within a Wetlands & Waterways is not allowed and will not be approved by Authority.

#### 2.19 'Schedule of Public Use Controls (LG.A 36(3)(d))'

The Schedule of Public Use Controls for Wetlands & Waterways according to the Parklands Plan is shown in Table 2.

**Table 2 Schedule of Public Use Controls for Wetlands & Waterways (Parklands Plan – TABLE 4)**

<i>Approved Public Uses</i>	<i>Restricted Public Uses</i>	<i>Prohibited Public Uses</i>
<i>These are Appropriate Uses and NO Permit is Required.</i>	<i>These are Uses with Limitations and A Permit is Required.</i>	<i>These are Inappropriate Uses and No Permit is available.</i>
<i>[NOTE: the nature and extent to which these uses will be appropriate will be affected by the provisions, constraints and obligations referred to in the Management Framework Part 3].</i>		Any use other than an Approved Public Use that has not been approved by the Authority in writing.
Nature study uses - including bird-watching; natural history; wildlife observation; self-guided nature tours; participation in ranger walks and talks, volunteer training sessions and school education excursions and drawing, painting and photography.  <i>[These uses must only take place within mown-grass areas, shelters, viewing areas, hides, board-walks, platforms, or formed pathways]</i>	Access to Enclosed Lands, and all uses and activities referenced in Part 2 Clause (4) of the SOPA Regulations 2007 (see <b>Appendix 4.1</b> )	Unauthorised uses that are likely to harm native flora, fauna or trees; damage landscapes, facilities, buildings, or park furniture; pollute the environment; interfere with the reasonable well-being or enjoyment of other visitors; or create health, safety or security hazards.
Low impact leisure uses - including walking; personal fitness and exercise; running; cycling; resting; meditating; painting; writing and reading.  <i>[These uses must only take place within mown-grass areas, shelters, viewing areas, hides, board-walks, platforms, or formed pathways]</i>	Low impact uses - including small public events; weddings; readings; displays; portable exhibitions; scientific research and model boating.	Water-based leisure, sports or entertainment activities or events of any kind (involving primary or secondary water contact) - including rowing; canoeing; swimming; fishing; sailing; paddling and diving. (Unless or until water quality testing shows that primary or secondary water contact by the public is appropriate.)
On-leash dog exercise at Badu Mangroves and Louise Savage Pathway ONLY.	Commercial uses of any kind - including ecotourism; provision of food, beverages or merchandise; filming and photography.	Inappropriate uses - including the lighting of fires; use of outdoor lighting; exercise of domestic animals; amplified music; flying of kites, balloons or model aircraft; Mountain X and BMX cycling activities; rollerblades or skateboards on boardwalks.

### 3.6.3 MANAGEMENT FRAMEWORK

Part 3 'Management Framework' of the Parklands Plan defines the directions, priorities, controls and activities to enable management in line with the objectives of the Parklands Plan, including objectives for biodiversity. The sections from the Parklands Plan that are relevant to managing biodiversity have been summarised as follows:

#### 3.5 'Buffer Zones'

This section identifies buffer zones around

- Newington Nature Reserve to increase the area and type of habitat available for species occupying the Reserve (50 m from boundary)
- The Brickpit to protect the area from landslips, due to geologically instability in this location (25 m from fence)

### 3.6 'Development in the Parklands (LG Act, S.36(3)(d))'

This section states that development in the Parklands must comply with all relevant environmental planning instruments, and must also be consistent with the objects and functions of the Authority concerning the Parklands as set out in Sections 28 and 29 of the SOPA Act 2001.

This section also states that "any development in the Parklands must be either explicitly authorised by the Parklands Plan or otherwise (upon informed assessment) be found to be consistent with all relevant provisions of the Public Use Regime and Scheme of Operations as it applies".

### 3.8. Maintenance of the Parklands (SOPA Act, S.29(a))

As per the SOPA Act 2001, S.29(a), SOPA is to maintain the Parklands according to the following principles:

- (a) compliance with all legislative and regulatory obligations;*
- (b) minimal risk to life or property;*
- (c) conservation of unique and important features;*
- (d) maximisation of asset serviceability and functionality;*
- (e) protection of biodiversity;*
- (f) provision of a diversity of quality settings for both programmed and un-programmed activities; and*
- (g) a variety of visitor opportunities for learning and other Parkland type experiences.*

### 3.12 Plan 6 – Parklands Threatened Species Habitats

Provides a plan that identifies areas in which threatened flora, fauna or communities exist and are subject to the Biodiversity Management Plan 2008 authorised by the relevant parts of the National Parks & Wildlife Act 1974, Fisheries Management Act 1994 and the Environment Protection & Biodiversity Conservation Act 1999.

Note that the Parklands Plan was adopted in 2010 and the existing SOPA BMP (2022) is to be replaced by the Draft SOPA BMP (2025). An updated Threatened Species Habitats map may be included in the forthcoming BMP.

### 3.14 Plan 8 – Nature Reserve & Brickpit Buffers

Provides a plan that identifies the buffer zones as outlined in section 3.5.

### 3.23 'Schedule of SOPA Activity Controls (LG Act, S.36(3)(d))'

The following table (Table 3 here, TABLE 5 in Parklands Plan) is taken from section 3.23 'Schedule of SOPA Activity Controls'. The table provides schedules of approved, restricted and prohibited SOPA activities. It is worth noting that the following is considered a 'prohibited SOPA activity':

"Activities that are likely to harm native flora, fauna, trees or landscapes; damage, facilities, buildings, or furniture; pollute the environment; interfere with the reasonable well-being or enjoyment of other visitors or create health, safety or security hazards."

**Table 3 Schedule of SYDNEY OLYMPIC PARK Activity Controls for all Categories of Land (Parklands Plan 2010)**

<i>Approved SOPA Activities</i>	<i>Restricted SOPA Activities</i>	<i>Prohibited SOPA Activities</i>
<p><i>These activities are Appropriate Activities..</i></p> <p><b>NO Parklands Approval Permit is Required. (SOPA Work Permit is Required for OH&amp;S due diligence and site coordination purposes)</b></p>	<p><i>These activities are Activities with Limitations.</i></p> <p><b>A Parklands Approval Permit is Required. (SOPA Work Permit is Required) (Development Consent may be Required)</b></p>	<p><i>These activities are Inappropriate Activities.</i></p> <p><b>No Parklands Approval Permit is available.</b></p>
<p><i>[NOTE: the nature and extent to which these activities will be appropriate will be affected by the same conditions affecting public uses referred to in the Management Framework</i></p>		<p>Any activity, other than an Approved SOPA Activity, that has not been approved by the Authority in writing.</p>
<p>Statutory compliance activities associated with SOPA's obligations of an environmental, ecological, heritage or public safety nature.</p>	<p>Access to Enclosed Lands, and all uses and activities referenced in Part 2 Clause 4 of the SOPA Regulations 2007 (see <b>Appendix 4.1</b>)</p>	
<p>Routine site presentation and maintenance works or built asset maintenance works that are in accordance with an approved SOPA term contract specification of service.</p>	<p>Staging or allowing the staging of sports or entertainment events of any kind.</p>	<p>Works or services that allow or encourage activities contrary to SOPA's statutory compliance obligations.</p>
<p>Routine precinct operations incidental to the day to day coordination and operation of the Parklands.</p>	<p>Entering into any commercial or non-commercial leases or licences of any kind.</p>	<p>Activities that are likely to harm native flora, fauna, trees or landscapes; damage, facilities, buildings, or furniture; pollute the environment; interfere with the reasonable well-being or enjoyment of other visitors or create health, safety or security hazards.</p>
<p>Routine natural area conservation activities that are according to current SOPA contract specifications of service.</p>	<p>Major Works, Minor Works and Asset Replacement activities of any kind.</p>	
<p><b>[NOTE: Parkland Activity Approval Permits can be issued for up to five (5) years for regular Restricted SOPA Activities that have standard conditions].</b></p>		

### 3.24.1 'Visitation Management Principle'

The Visitation Management Principle identifies that the location, frequency and intensity of use does not degrade the land (including its natural and built elements).

### 3.24.3 'Access Management Principle'

Access to the different parts of the Parklands will be based on a regime where the emphasis is on providing access for all people (both able and people with disabilities) to samples of the different places for most of the time.

The Access Management Principle does not encourage use of the Park at night, allowing ecological processes to occur without light or disturbance:

*Areas identified as being of high ecological value will be more restricted to public access than areas identified as being of high recreational value.*

### 3.24.6 'Water & Energy Management Principle'

The Water and Energy Management Principle gives priority for allocation of natural water supplies for the maintenance of ecological systems.

### 3.24.7 'Biodiversity Management Principle'

This section of the Parklands Plan defines the principle for managing biodiversity as:

*The Parklands will be managed to conserve and enhance the biodiversity within, giving particular emphasis on the 10 priority species and ecological communities therein.*

The section also provides the following guidelines for achieving the biodiversity management principle, as follows:

- New developments, modification of ecosystems, changes in use or changes in Parkland work practices, should undergo an ecological impact assessment.
- Management actions should be consistent with the objectives of the SYDNEY OLYMPIC PARK Biodiversity Management Plan and the associated Licence issued under the National Parks and Wildlife Act 1974
- Short and long term biodiversity and ecosystem impacts that may be direct, indirect or cumulative should always be taken into account
- There should be full compliance with relevant objectives and legal requirements relating to any species and/or ecological communities operational management plans
- To the extent that it is reasonable to do so at the time, the precautionary principle should be applied when making major decisions that might impact on biodiversity

### 3.24.9 'Lighting Management Principle'

This section is relevant to development that occurs adjacent to areas mapped on the SYDNEY OLYMPIC PARK Dark Areas Map. The lighting management principle is defined in this section as follows:

*Lighting of the Parklands will always be kept to a minimum to discourage inappropriate night-time uses and activities, and where present will meet appropriate lighting standards*

The section also provides the following guidelines for achieving the lighting management principle, as follows:

- No lighting should interfere with the nocturnal activities of wildlife, particularly in the wetland areas.
- Lighting that is necessary, should not exceed fitness for purpose nor extend beyond the area of intended illumination while also being appropriate to the setting
- Alternatives to lighting, as a means of protecting or highlighting elements of an area, should always be given careful consideration during planning and design
- Lighting should be non-intrusive to neighbouring residents or Parkland users and be considerate of the cumulative effects with other lighting - within and outside the Parklands.
- Lighting controls should be managed judiciously to limit hours of operation to suit the circumstances of the site; ensure a lack of lighting to deter visitation to inappropriate areas and to support visitation to areas where after-dark use is desirable or invited
- Lighting should not be used in the Parklands for the sole purposes of decoration or promotion

### 3.25.1 'Priorities for the Parklands Generally'

Section 3.25 provides Sydney Olympic Park's management priorities according to the Parklands Plan. Section 3.25.1 provides general management priorities. Of particular relevance to biodiversity management and protection are the following priorities from 3.25.1:

- Develop and implement appropriate operational policy and procedures to guide management of the extent, nature and intensity of visitation to and use of the different categories of land and the places therein
- Continue scientific and social research, monitoring, survey and investigation activities, sufficient to identify necessary changes to the public access and uses regime and management policies and procedures; and apply the findings through an adaptive management approach to operations and maintenance
- Manage the Parklands ensuring compliance with all statutory plans and other legislation obligation

### 3.25.2 'Priorities for Leisure and Play Areas'

This section of the Parklands Plan provides priorities for recreational areas of Sydney Olympic Park, but has a number of priorities relevant to biodiversity as follows:

- Minimise the impacts from any developments, uses and activities in Blaxland Riverside Park, Wilson Park and Newington Armory on the proper function and security of the adjoining Silverwater Correctional Centre
- Achieve optimum community use of Woo-la-ra and Haslams Creek Flats (park-like areas), so that increased visitation with a focus on recreational, social and educational/interpretive activities is facilitated, while ensuring protection of the remediated elements and maintenance of their habitat support functions
- Limit the availability of Haslams Oval to the public for the casual playing of games - and not permit regular organised seasonal sports training or competitions
- Achieve optimum community use of Woo-la-ra and Haslams Creek Flats (park-like areas), so that increased visitation with a focus on recreational, social and educational/interpretive activities is facilitated, while ensuring protection of the remediated elements and maintenance of their habitat support functions
- Manage Kronos Hill (habitat areas) to retain and enhance its habitat value for wildlife, particularly the Green and Golden Bell Frog and native birds, while allowing for low-intensity nature-based and leisure activities in an appropriately managed way
- Give precedence to the function of all freshwater ponds as providing primary habitat for the Green and Golden Bell Frog, when considering developments, changes of use, and/or maintenance activities

### 3.25.4 'Priorities for Conservations Areas'

This section of the Parklands Plan provides priorities for conservation of biodiversity in conservation areas of Sydney Olympic Park, as follows:

- Preserve the function of the Northern Water Feature and Eastern Water Quality Control Pond as wildlife habitat and key parts of the stormwater management infrastructure of Sydney Olympic Park
- Investigate opportunities for increasing public access to and benefit from The Brickpit through a range of compatible uses including the possible provision of: boardwalks and access ways; viewing platforms; interpretation and improving the visual appearance of freshwater wetlands and other habitats

[Note: any public use of The Brickpit must satisfy the requirements of the Sydney Olympic Park Biodiversity Management Plan approved by the NSW Department of Environment, Climate Change and Water. This requirement takes precedence over the Parklands Plan]

- Provide increased environmental, conservation and leisure type experiences and opportunities within The Brickpit and around The Brickpit Rim through installation of appropriate pathway, boardwalks, lookout points, interpretation, and seating etc

- Identify and implement ways of engaging with the community and appropriately connecting them with learning and activities associated with nature conservation in the Parklands
- Consulting with the Department of Environment, Climate Change and Water before any major changes in use or the undertaking of major works or developments in Newington Amory and Woola-ra that are considered to impact on the Newington Nature Reserve
- Taking advice from a herpetologist before any development, use or activities intended to provide enhanced visitor experience or amenity in The Brickpit and limit development to meet any requirements of Environment Australia and the Department of Environment, Climate Change and Water
- Avoid any building or permit accessed by the public within the Landslip Zone of The Brickpit unless independent geological survey advice confirms it is safe to do so and any required preparatory works have been completed
- Review the suitability and any requirements for the existing former Brickworks, heritage buildings to be conserved and/ or adaptively reused to support any future programs of interpretation on the site
- Manage and operate the Water Reservoir in The Brickpit primarily for support of water recycling and water management purposes in association with operation of WRAMS, whilst avoiding any adverse environmental impacts on surrounding habitat areas

#### 3.25.5 'Priorities for Wetlands & Waterways'

This section of the Parklands Plan provides priorities for managing wetlands and waterways in Sydney Olympic Park, as follows:

- Establish an exit timetable for decommissioning and permanent removal of commercial AM radio broadcasting towers from wetlands. (Recognising that in the interim the radio transmission functions in Nuwi Wetland, Badu Mangroves, and Bicentennial Park are legitimate pre-existing use rights).
- Improve the security of endangered ecological communities already having a foothold or established in wetlands and along waterways
- Enhance the quality of Narawang Wetland habitat for the Green and Golden Bell Frog and Latham's Snipe
- Assess projected sea level rise impacts and risks on salt marsh and mangrove communities and develop management responses accordingly
- Identify and implement ways of appropriately providing improved public access into and information about the wetlands
- Consider rehabilitating the contaminated wetland adjacent to Wilson Park
- Retain and preserve the character and quality of the Narawang Wetlands for nature conservation and enhance its function as the principal harvested water supply for Parklands irrigation
- Conserve and enhance the riparian vegetation of Haslams Creek to encourage a self-managing saltmarsh community
- Restrict uses in the Haslams Reach riparian creek vegetation areas to low-intensity uses and maintain it primarily for habitat and landscape values
- Manage Nuwi Wetland for conservation of its wetland values and restrict public activity to very low-intensity uses and low-impact developments
- Manage the Badu Mangroves primarily for conservation purposes as shorebird habitat but allow appropriate low-intensity nature-based leisure activities and low-impact educational and scientific programs
- Progressively rehabilitate and enhance Triangle Pond while allowing for appropriate low-intensity nature-based leisure activities
- The shores of the wetland areas are to be appropriately vegetated and public viewing is to be generally restricted to appropriately designed platforms or hides to protect local and migratory birds

### 3.6.4 PARKLANDS APPROVAL PERMIT

As mentioned above, the Parklands Plan has defined a number of parklands uses as either “approved”, “restricted” or “prohibited” public uses. Restricted public uses are public uses that Sydney Olympic Park has identified as having a high likelihood of:

- impacting on safety, care and/or experience of visitors,
- impacting on the presentation and function of assets
- impacting on the integrity of flora and fauna communities within the Parklands

Restricted public uses require formal written approval from Sydney Olympic Park in the form of a ‘Parklands Approval Permit’. The proposed use must be undertaken in strict compliance with any of the conditions specified by Sydney Olympic Park in the Permit.

#### Parklands Uses Compliance Test

Impacts of restricted activities on biodiversity are assessed through the Parklands Uses Compliance Test (Parklands Plan, Part 4 - Appendix 4.2). If the activity is considered suitable, the Parklands Approval Permit requires an Environmental Management Plan to mitigate impacts on biodiversity.

### 3.6.5 APPENDIX 4.4 – PRECINCT DESCRIPTIONS [REF: LGA S36(3A)]

This section of the Parklands Plan identifies key values of precincts which include important ecological and biodiversity values.

Relevant key values from the Parklands Plan for each of Sydney Olympic Park’s precincts is provided as follows:

#### Bicentennial Park

- A destination supporting learning in conservation and environmental management
- Habitat for fish, saltmarsh, frogs, bats and birds
- Significant water-bird habitat at Lake Belvedere

#### Blaxland Riverside Park

- Bush bird habitat
- Green and Golden Bell Frog habitat and movement corridor

#### Newington Armory

- Buffer to habitats of the adjacent Newington Nature Reserve and linkage between the wetland and forest habitats thereof
- An extension of three endangered ecological communities – Sydney Turpentine Ironbark Forest, Coast Saltmarsh, and Swamp Oak Floodplain Forest and habitat of the Green and Golden Bell Frog

#### Woo-la-ra

- A buffer, and extension of support habitat for the adjacent Newington Nature Reserve and Narawang Wetland
- Supplementary habitat and movement corridor for bush birds and the Green and Golden Bell Frog

#### Wentworth Common

- A place of primary habitat for the Green and Golden Bell Frog, and important habitat for bush birds

#### Wilson Park

- A place providing habitat for Green and Golden Bell Frogs and bush birds within the wetland.
- Feeding habitat for red-rumped parrots on mown kikuyu lawns

#### Archery Park

- N/A

#### Parkland Junction

- N/A

#### Narawang Wetland

- Primary habitat for the Green and Golden Bell Frog
- Rich in birdlife, habitat for the Latham's Snipe
- Contains extensions of Sydney Turpentine Ironbark Forest
- Provides buffering to Newington Nature Reserve

#### Haslams Creek Flats

- An important estuarine ecosystem, and has important hydrological roles in flood mitigation
- Includes freshwater habitat for water birds and the Green and Golden Bell Frog, and is a water quality control pond for storm water from the Newington area
- The creek floodplain supports extensive areas of coastal saltmarsh endangered ecological community

#### Haslams Reach

- Estuarine habitat including creek habitat, mangrove and saltmarsh communities, with a low level of human disturbance
- Evaporation ponds are a component of the leachate management system; the ponds and their grassy surrounds also provide habitat for the Green and Golden Bell Frog

#### Nuwi Wetland

- Habitat for a variety of estuarine wetland species, including saltmarsh, mangroves and water birds

#### Badu Mangroves

- As an estuarine wetland system supporting mangrove and saltmarsh communities, and providing habitat for resident and migratory birds, fish, bats, frogs and reptiles
- An opportunity for the community to appreciate the natural features of the Parklands through educational and interpretive programs, research, and passive recreational activities
- Listed on the 'Directory of Important Wetlands in Australia'

#### Kronos Hill

- As a place that provides important habitat for a variety of species, including primary habitat for the threatened Green and Golden Bell Frog, and habitat for a high abundance and diversity of birds

#### The Brickpit

- A large population of the endangered Green and Golden Bell Frog, regarded by scientists as the most ecologically significant and secure subpopulation at the Park
- High biodiversity for native fauna due to its size, mosaic of habitat types and low levels of current-day human disturbance.
- Absence of the predatory fish
- Original soil profiles and regenerating native vegetation on The Brickpit rim

### 3.7 NEWINGTON NATURE RESERVE PLAN OF MANAGEMENT (2003)

The *Newington Nature Reserve Plan of Management (2003)* (Newington PoM), adopted in 2003, outlines the basis for management of the Newington Nature Reserve prepared by the National Parks and Wildlife Service (NPWS) and Sydney Olympic Park. The Newington PoM intends that Newington Nature Reserve will be managed to retain and enhance the high ecological values of the woodland and wetland.

Works given rise to by the DRAFT Biodiversity Master Plan 2050 must align with the objectives of the Newington PoM.

### 3.8 OTHER SOPA ENVIRONMENTAL POLICIES AND PROCEDURES

Sydney Olympic Park has a range of existing environmental policies/procedures that aim to protect and conserve the high biodiversity observed in the area. Table 4 provides a summary of relevant existing environmental policies and procedures.

**Table 4 Summary of existing relevant SOPA environmental policies**

Policy name	Overview
Environmental Management: Biodiversity Management Policy	This Policy details how the Authority will exercise stewardship over the biodiversity assets in its care, and comply with statutory obligations under environmental legislation, to ensure the long-term sustainability and survival of the Park's ecological assets.
Environmental Management: Environmental Assessment of SOPA Works and Activities	<p>This policy outlines the obligations and procedures for assessing the environmental risks and legal compliance requirements associated with works and programs conducted by the Authority.</p> <p>SOPA staff are required to take a due diligence approach to environmental management in works and programs undertaken by themselves, their staff their contractors or licensees, and to consider opportunities for environmental improvements when planning works.</p>
Environmental Management: Invasive Environmental Weeds Policy	Lists plant species that are declared invasive environmental weeds and the procedure for managing these weeds at Sydney Olympic Park.
Environmental Management: Newington Nature Reserve Access Procedures	<p>The Brickpit, Newington Nature Reserve, Wilson Park Compound and radio tower lease areas are classified as 'restricted access areas'.</p> <p>Access to these areas by staff, contractors and the general public is highly controlled and strictly regulated and is managed in accordance with this procedure.</p>
Environmental Management: Pesticides Use Notification Policy	This policy describes how SOPA will implement their Pesticide Use Notification plan which notifies the public about pesticides application in outdoor public places, and to keep records of pesticide application for a period of three years.
Environmental Management: Pollution Incident Notification Policy	Defines when a notification is required and outlines obligations and procedures for notifying the relevant authorities when a pollution incident occurs at Sydney Olympic Park.
Environmental Management: Register of Legal and Other Environmental Requirements	This document provides a central and accessible register of the environmental commitments, legal requirements and government policies that affect SOPA operations. The document includes a register of applicable State and National environmental legislation.
Stormwater Management & Water Sensitive Urban Design	This policy sets SOPA's requirements for stormwater management and water sensitive urban design (WSUD) and includes requirements for design, planning and construction.

### 3.9 PRELIMINARY PROJECT APPROVALS

Preliminary Project Approvals inform the capital works program at Sydney Olympic Park to obtain in-principle agreement for works proposed in the following year. They outline the need, purpose, risks and benefits, resourcing arrangements, value assessment and timing.

# 4 DESKTOP ANALYSIS

## 4.1 SYDNEY OLYMPIC PARK MASTER PLAN 2050

The following section provides maps from the Sydney Olympic Park Master Plan 2050 including:

- Proposed land uses (Figure 9)
- Proposed building heights (Figure 10)
- Water catchments (Figure 11)

These maps have been referenced as they provide an indication of where development is likely to occur given the implementation of the Master Plan 2050. The maps in this section are centred on the area around the main Town Centre. Refer to the master plan for further details and maps.

### Land use

A range of land uses are proposed for the urban areas of Sydney Olympic Park which is currently zoned as B4 Mixed Use according to the NSW Planning Portal Spatial Viewer.

Residential land uses adjacent to Haslams Creek, west of Bennelong Pond and the Badu Mangroves as well as on Sarah Durack Ave and Australia Ave remain as envisaged in Master Plan 2030 (2018 Review) and Master Plan 2030 (Interim Metro Review).

Key changes in land use as include residential land uses immediately south of the Brickpit.

Commercial land uses are proposed adjacent Olympic Park railway station.



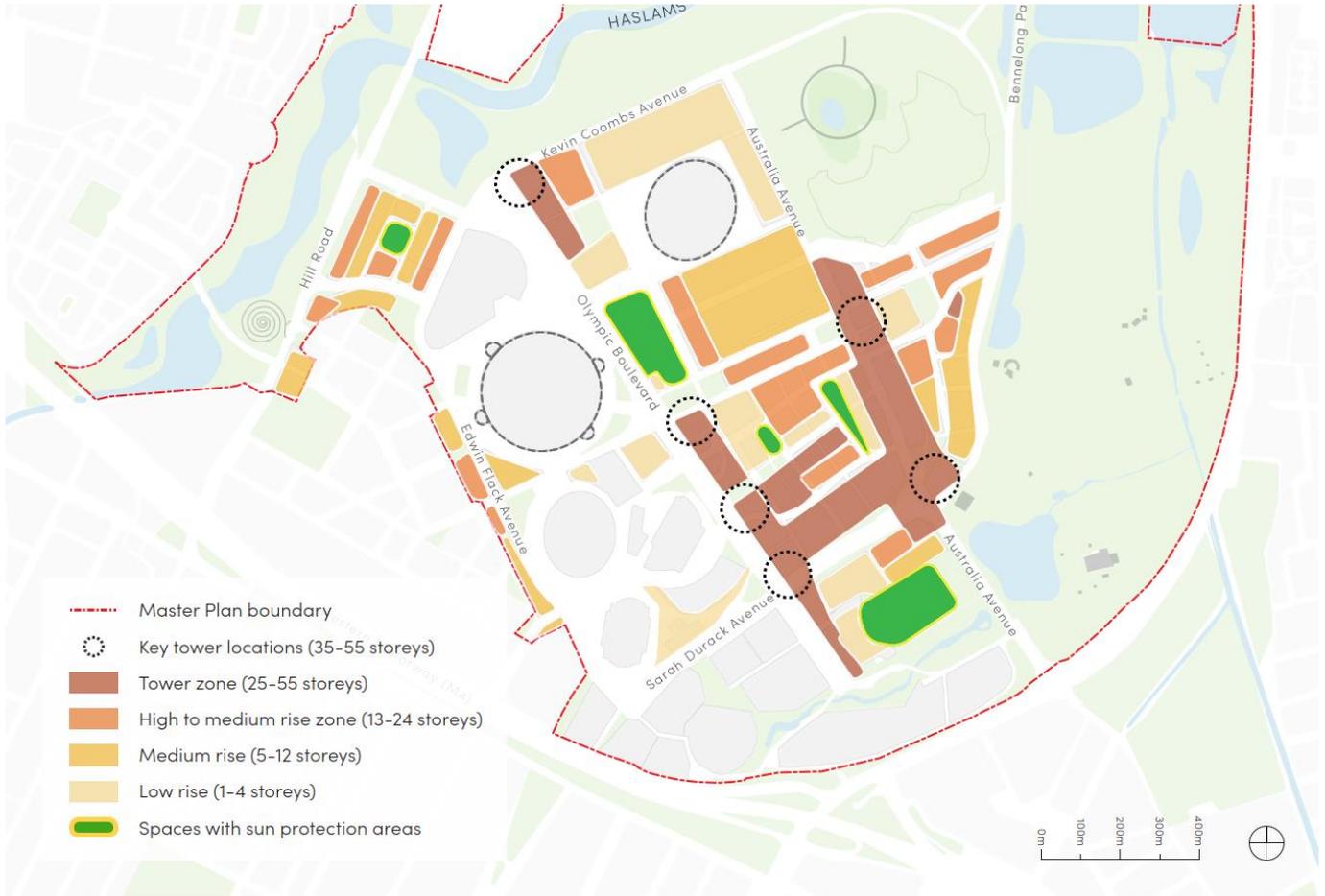
**Figure 9 A snapshot of the proposed Land use plan focused on the Town Centre (Source: Master Plan 2050)**

Building heights

The Master Plan 2050 building heights map (Figure 10) shows that there are:

- Six key towers (35-55 storeys) proposed including four on Olympic Blvd and two on Australia Ave
  - o Potential shading impacts of the tower on the corner of Kevin Coombs Ave and Olympic Blvd – refer to section 5.1.2
- High to Medium rise zones (13-24 storeys) south of The Brickpit and adjacent to Haslams Creek
- Medium rise zones (5-12 storeys) immediately west of Bennelong Pond

Potential impacts of these multistorey buildings are discussed in section 4.2.



**Figure 10 A snapshot of the Building heights plan (Source: Master Plan 2050)**

Catchments

A snapshot of the Master Plan 2050 'water catchments' map is provided in Figure 11.



**Figure 11 A snapshot of the Water catchments map (Source: Master Plan 2050)**

Nature positivity and monitoring

The Master Plan 2050 aims to ensure Sydney Olympic Park is a nature positive suburb. Sydney Olympic Park will measure its progress towards being a nature positive suburb as outlined in section 3.3 Ecological Monitoring Program of the Biodiversity and Conservation Management Plan.

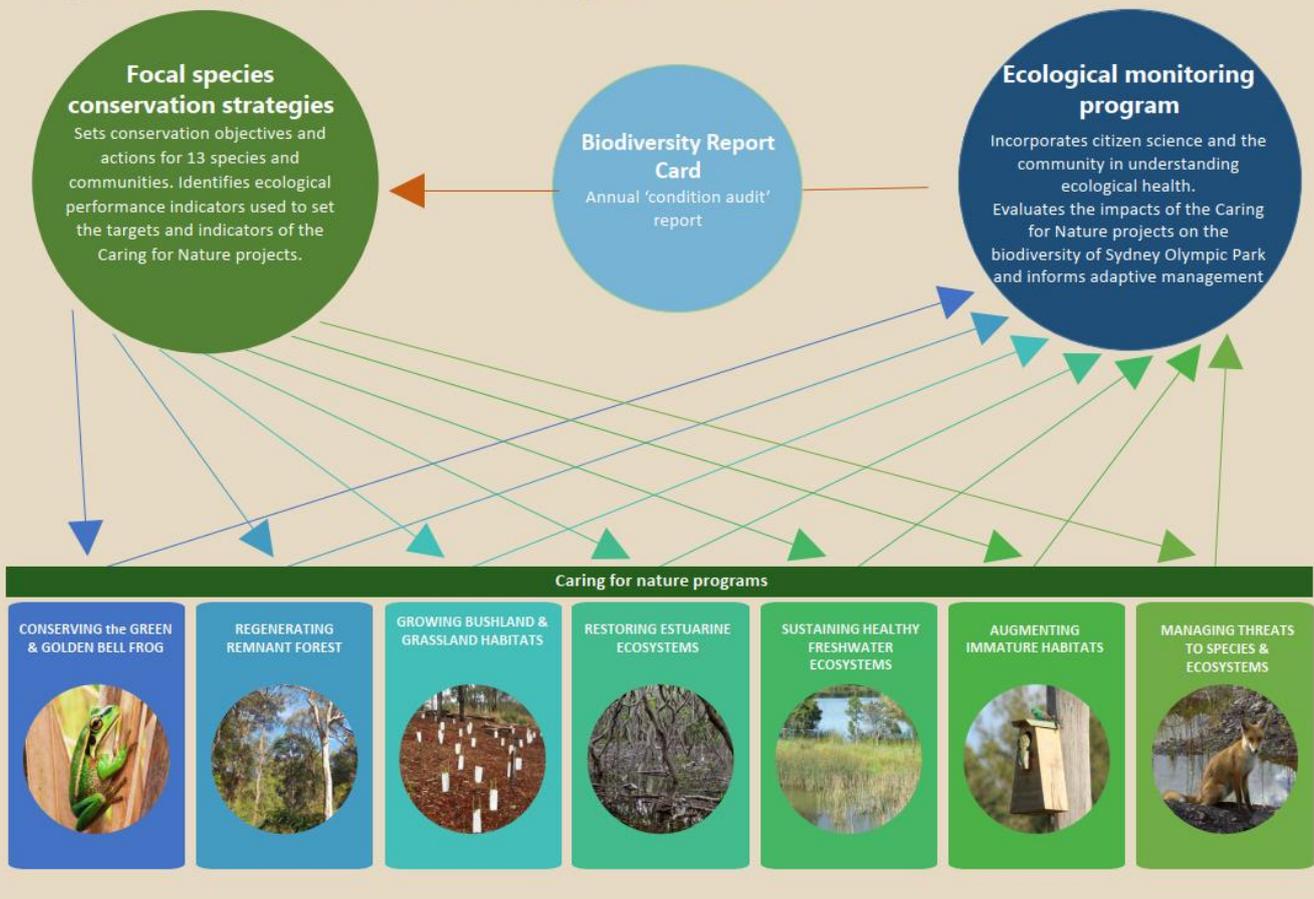
The ecological monitoring program “is designed to provide measurable indicators to assess the status of biodiversity over time. Thirteen indicator species and communities have been selected to provide key information along with species assemblages of bird, reptile and amphibians.

*This provides an inventory of vegetation condition, habitat structure, and species/community distributions. All records are entered in the Sydney Olympic Park Fauna Database and supplement the formal program.*

The ecological monitoring program includes communities, frequency and monitoring programs for each ecological community monitoring program. Further detail on this is available in section 3.3 Ecological Monitoring Program of the Biodiversity and Conservation Management Plan.

The monitoring is then compiled into a biodiversity report card and informs the conservation strategies at Sydney Olympic Park. This is outlined in the figure below.

## Adaptive management for biodiversity conservation



**Figure 12 Ecological monitoring and reporting (Source: Biodiversity Strategy and Management Plan 2022)**

## 4.2 POTENTIAL IMPACT LOCATIONS

Sydney Olympic Park have extensive, field validated maps for the various biodiversity values located within the Parklands. The biodiversity maps from the Draft Sydney Olympic Park Biodiversity Management Plan 2025 have been used for the desktop analysis and are provided in Appendix A and include:

- Threatened Species Habitat Map
- Land Zoned for Conservation Map
- Frog Habitats Map
- Green and Golden Bell Frog Habitats Map (The Brickpit)
- Green and Golden Bell Frog Habitats Map (Kronos Hill, Wentworth Common and Haslams Reach)
- Green and Golden Bell Frog Habitats Map (Narawang Wetland)
- Green and Golden Bell Frog Habitats Map (Blaxland Riverside Park)
- Newington Nature Reserve Map
- Sydney Turpentine Ironbark Forest Map (Newington Nature Reserve and Newington Armory)
- *Zannichellia palustris* Distribution Map (Bennelong Pond)
- Coastal Saltmarsh and Mangrove Conservation Areas Map
- Saltmarsh Monitoring Sites Map

- Swamp Oak Floodplain Forest Monitoring Sites Map
- Mangrove Forest Monitoring Sites Map
- Dark Areas Map

The focus species of the DRAFT Biodiversity Management Plan 2025 (Refer to Section 3.1) have also been considered in the potential impacts in this section.

The Master Plan 2050 is currently in the finalisation stage of planning. This stage of planning provides a number of changes to land use zones and building heights throughout areas of Sydney Olympic Park. Development is restricted to the existing urban developed areas and hence direct impacts such as habitat removal, are not proposed as part of the Master Plan 2050.

The Master Plan 2050 supports increased use in the Parklands particularly in Haslams Park and Newington Armory along with transport connections that may need lighting and will increase disturbance and edge effects.

A number of key locations for potential indirect biodiversity impacts have been identified and are shown in orange in Figure 13. These locations have been identified as being in close proximity to ecologically sensitive areas and are discussed further in the sections below.

It is considered that development “behind” the identified buildings outlined in Figure 13 would have minimal impacts to ecologically sensitive areas. It is noted that these areas are outside The Brickpit 100m buffer zone as identified in the Plan 8 in the Parklands Plan (SOPA, 2010).

In this strategy, potential ‘direct’ and ‘indirect’ impacts have been identified due to the implementation of the Master Plan 2050. ‘Direct’ impacts have been identified as those impacts that will be a direct consequence of an action (i.e. removal of vegetation within a mapped habitat zone). ‘Indirect’ impacts have been identified as those impacts that are an indirect consequence of an action (i.e. increased use of the parklands paths



**Figure 13 Potential biodiversity impact areas (orange) (Markup: Sydney Olympic Park Master Plan 2050). Orange polygons depict Master Plan 2050 sites**

#### 4.2.1 PROPOSED HASLAM'S NEIGHBOURHOOD

##### GGBF Habitat

Locations 4HN, 5HN, 6HN are sites that are part of the proposed Haslams Neighbourhood in The Master Plan 2050 (Figure 13). These locations are located in close proximity to the Northern Water Feature which is mapped as Green and Golden Bell Frog (GGBF) 'Frog Habitat' and the water feature itself as 'Frog Pond' (Refer to Appendix A – Map 6).



**Figure 14 A snapshot of the threatened species habitats map for the Haslams Neighbourhood (Source: Sydney Olympic Park). Orange polygons depict Master Plan 2050 sites**

Coastal Saltmarsh/Coastal Wetlands

The endangered ecological community (EEC) 'Coastal saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' is located immediately west of the 4HN master plan site (Refer to Appendix A – Map 12).

Similarly, this area is mapped as 'Coastal Wetlands' under the R&H SEPP (Figure 15). This map also indicates that a portion of the development zone sits within the 'Proximity Area for Coastal Wetlands' (Figure 15).



**Figure 15 A snapshot of the Coastal Wetlands map for the Haslams Neighbourhood (Source: NSW Planning Portal Spatial Viewer)**

Lighting

The Sydney Olympic Park Dark Areas Map (Appendix A – Map 21) has also been consulted with reference to the proposed Haslams Neighbourhood. The mapping indicates that there is a low light level area immediately west of 4HN, meaning that light levels are typically ~0.2 lux in this zone. The area of the Northern Water Feature has been mapped as 'moderate to high' light levels.



**Figure 16 A snapshot of the 'Dark Areas' map for the proposed Haslams Neighbourhood (Source: SOPA). Orange polygons depict Master Plan sites**

Migratory shorebirds

Migratory shorebirds are protected under the EPBC Act, as a 'matter of national environmental significance'. Migratory shorebirds are also protected under international conservation agreements, such as CAMBA, JAMBA and ROKAMBA. Sydney Olympic Park contains habitat for a number of migratory shorebirds including saltmarsh, mudflats and mangrove forest, with key habitat areas including Newington Nature Reserve, Badu Mangroves and the Waterbird Refugia.

Generally, the proposed Haslams Neighbourhood is not within close proximity of significant habitat for migratory shorebirds. However, the Northern Water Feature has been known to support the survival of Latham's Snipe (*Gallinago hardwickii*), a migratory shorebird listed as endangered in NSW and vulnerable under the EPBC Act. Given that this species is a migratory bird it is also considered a matter of national environmental significance under the EPBC Act.

Potential direct and indirect impacts to biodiversity due to development within the proposed Haslams Neighbourhood are summarised in Table 5.

**Table 5 Potential direct and indirect biodiversity impacts in the vicinity of the proposed Haslams Neighbourhood**

Species, ecological community, habitat or environmental concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	<p><u>NSW</u>: Endangered</p> <p><u>Commonwealth</u>: Vulnerable</p>	Disturbance of habitat zones by humans.	<p>Poor water quality due to construction runoff entering frog habitat.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Spread of Chytrid fungus due to construction of human disturbance of habitat.</p> <p>Re-introduction of <i>Gambusia</i> through the construction phase by contractor vehicles coming from contaminated sites or by residents moving from one wetland to another.</p> <p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to adjacent urban development.</p> <p>Increases in fox, cat and rat predation due to increased residential occupation.</p> <p>Illegal removal of frogs by residents.</p>
Coastal saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	<p><u>NSW</u>: Endangered</p> <p><u>Commonwealth</u>: Not listed</p>	Uncontrolled public access leading to habitat destruction (trampling vegetation etc)	<p>Construction runoff leading to sedimentation or erosion of downstream coastal saltmarsh.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Shading of saltmarsh due to the erection of multi-storey buildings.</p>

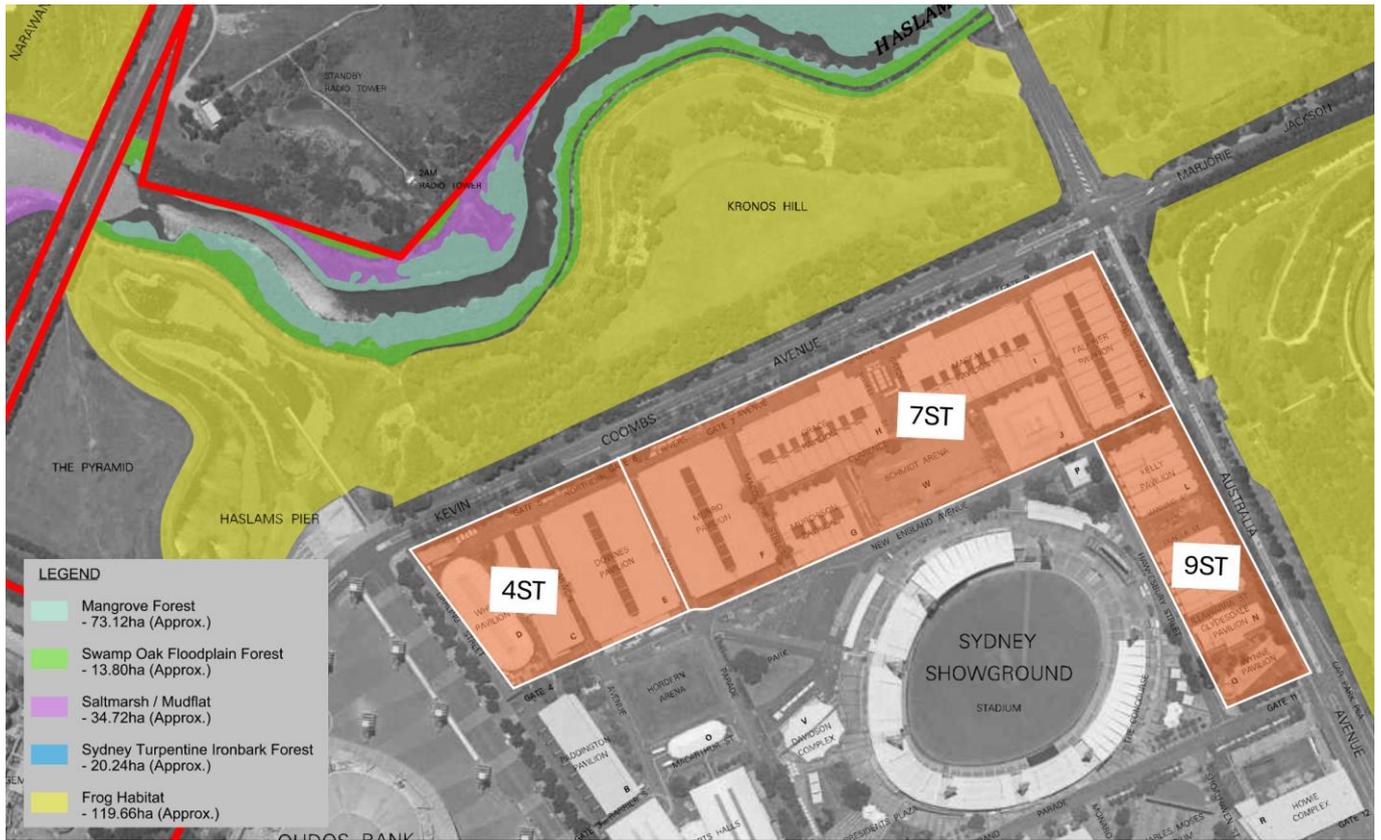
Species, ecological community, habitat or environmental concern	Conservation status	Potential direct impacts	Potential indirect impacts
			Increase nutrients levels due to stormwater runoff from new impervious surfaces from urban development.
Coastal Wetlands	N/A – R&H SEPP	As above.	As above.
Dark Areas Map	N/A		Construction works at night. Urban development increases light levels due to light spill from new buildings.
Migratory shorebirds	<u>NSW:</u> Protected under BC Act <u>Commonwealth:</u> Protected under EPBC Act	Bird strikes with structures, during construction or operation of multistorey buildings.	Impacts to quality of Northern Water Feature may have negative impacts on habitat quality for Latham's Snipe. Increases in fox, cat and rat predation due to increased residential occupation.

#### 4.2.2 PROPOSED STADIA PRECINCT

Locations '4ST, 7ST, 9ST' are part of the Stadia Precinct as per the Master Plan 2050 and are shown in Figure 13, highlighted in orange. This precinct is located immediately south of Kronos Hill and the Northern Water Feature.

##### GGBF Habitat

Kronos Hill and the area surrounding the Northern Water Feature are mapped a GGBF 'Frog Habitat' according to the GGBF Frog Habitats Map (Refer to Appendix A – Map 6). The Northern Water Feature itself, as well as various ponds around Kronos Hill are mapped as 'Frog Pond' on the GGBF Frog Habitats Map. There is also significant frog habitat located at The Brickpit, which is located immediately east of the proposed stadia precinct on the eastern side of Australia Ave.



**Figure 17 A snapshot of the threatened species habitats map for the Stadia Precinct (SOPA, 2022). Orange polygons depict Master Plan sites**

### Woodland birds

Kronos Hill is referred as important habitat for various woodland birds in the Draft Biodiversity Management Plan 2025 (BMP). This group of species is listed as a focus for the draft BMP (Refer to section 3.1). The group of species includes the threatened species, Swift Parrot (*Lathamus discolor*), Flame Robin (*Petroica boodang*) and Scarlet Robin (*Petroica phoenicea*).

### Migratory shorebirds

Migratory shorebirds occur throughout Sydney Olympic Park and utilise mangroves, saltmarsh and mudflat habitats for roosting and foraging. Minimal impacts are anticipated to migratory shorebirds as a result of development in the proposed Stadia Precinct, because key habitat areas for these species are located away from the development.

The Stadia Precinct proposes a 'Key Tower (35-55 storeys)' and 'high to medium rise (13-24 storeys)' zones, the potential for migratory bird strikes due to the erection of multistorey buildings must be considered.

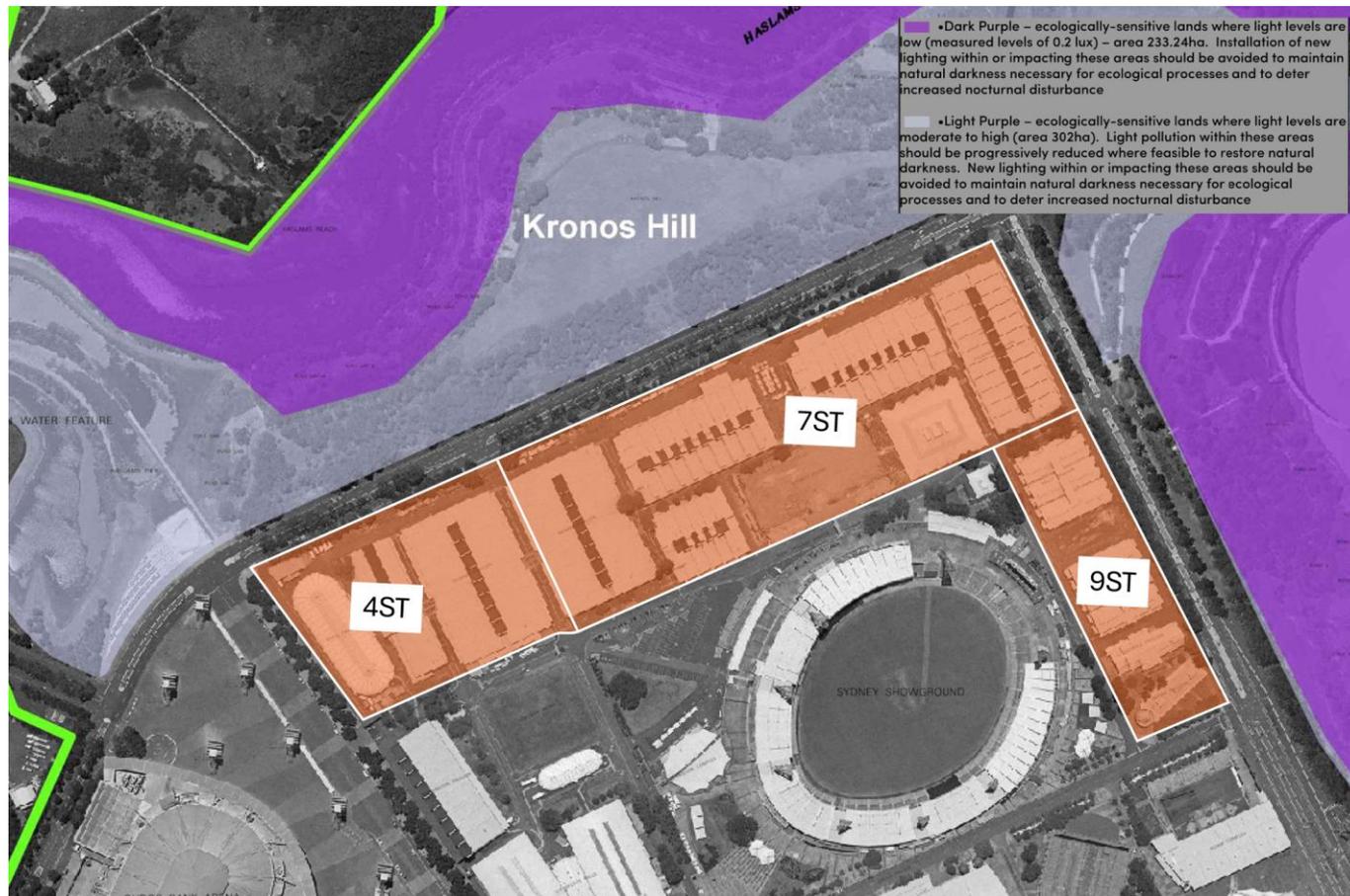
### Horned Pondweed (*Z. palustris*)

The endangered aquatic plant, Horned Pondweed (*Zannichellia palustris*) has been found sporadically in Northern Water Feature (DRAFT Sydney Olympic Park BMP 2025). The proposed Stadia Precinct is within the catchment for the northern water feature pond and therefore will have to consider the potential impacts on this threatened species.

### Lighting

Kronos Hill is mapped on the Dark Areas Map as ecologically sensitive land where light levels were measured as 'moderate to high' (Figure 18). This means developments close to this area should look to progressively restore light levels to low.

The Brickpit would also be impacted by new lighting in the area. The Brickpit is mapped as dark purple, where 'light levels are low'. Installation of new lighting that would impact upon the lighting of these areas should be avoided.



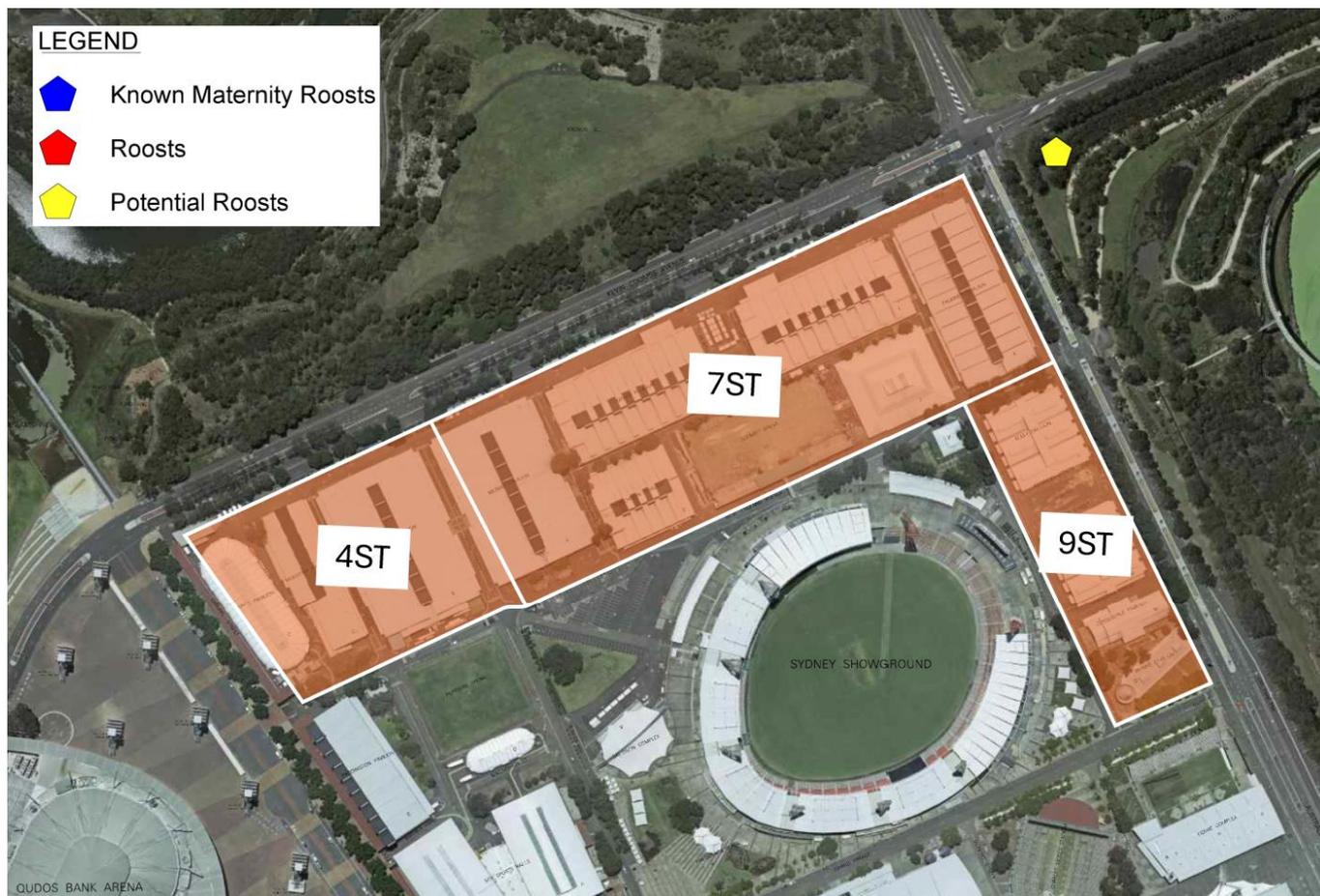
**Figure 18 A snapshot of the 'Dark Areas' map for the proposed Stadia Precinct (Source: Sydney Olympic Park). Orange polygons depict Master Plan 2050 sites**

### Microbats

There are five species of microbat that occur in Sydney Olympic Park and are listed as vulnerable in NSW, including:

- The Southern Myotis (*Myotis macropus*),
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*),
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*),
- Greater Broad-nosed Bat (*Scoteanax ruepellii*)
- Little Bent-winged Bat (*Miniopterus australis*)

The DRAFT BMP contains the map of microbat roosts which identifies 'known maternity roosts', 'roosts' and 'potential microbat roosts'. The map shows that there is a potential microbat roost immediately east (<50 m) of the 7ST master plan site (Figure 19).



**Figure 19** A snapshot of the ‘Microbat Roosts and Maternity Roosts’ map (Source: Sydney Olympic Park). Orange polygons depict Master Plan sites

Potential direct and indirect impacts to biodiversity due to development within the proposed Stadia Precinct are summarised in Table 6.

**Table 6** Summary of potential direct and indirect biodiversity impacts in the vicinity of the Stadia Precinct

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	NSW: Endangered Commonwealth: Vulnerable	Disturbance of habitat zones by humans.	Poor water quality due to construction runoff entering frog habitat. Weed invasion and displacement due to spread of weeds from construction sites. Spread of Chytrid fungus due to construction of human disturbance of habitat. Increases in fox, cat and rat predation due to increased residential occupation.

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to adjacent urban development.</p> <p>Pesticide use within the catchment.</p>
Woodland birds (habitat)	<p><u>NSW:</u> Endangered (Swift Parrot)</p> <p>Vulnerable (Flame Robin, Scarlet Robin)</p> <p><u>Commonwealth:</u> Critically Endangered (Swift Parrot)</p>	Disturbance to birds, and damage to habitat including nest sites by uncontrolled public access, off-lead dogs, or inappropriate authorised access.	<p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to adjacent urban development.</p> <p>Increases in fox, cat and rat predation due to increased residential occupation.</p>
Migratory shorebirds	<p><u>NSW:</u> Protected under BC Act</p> <p><u>Commonwealth:</u> Protected under EPBC Act</p>	Bird strikes with structures, during construction or operation of multistorey buildings.	Increases in fox, cat and rat predation due to increased residential occupation.
Horned Pondweed ( <i>Zannichellia palustris</i> )	<p><u>NSW:</u> Endangered</p> <p><u>Commonwealth:</u> Not listed</p>		<p>Increased sedimentation, turbidity and nutrient loads due to construction runoff.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p>
Microbats	<p><u>NSW:</u> Vulnerable (Southern Myotis, Eastern False Pipistrelle, Large Bent-winged Bat, Greater Broad-nosed Bat, and Little Bent-winged Bat)</p> <p><u>Commonwealth:</u> Not listed</p>		<p>Inappropriate lighting at potential roost site due development at 7ST adjacent.</p> <p>Inappropriate use of pesticides near potential roost site.</p> <p>Changes to insect populations as a result of changes to insect habitat (i.e. vegetation</p>

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			removal, pest control, lighting).
Dark Areas Map	N/A		Construction works at night Urban development increasing light levels due to light spill from new buildings.

#### 4.2.3 PROPOSED EASTERN NEIGHBOURHOOD (1EN, 2EN)

Locations 1EN and 2EN are part of the proposed Eastern Neighbourhood as shown in the Master Plan 2050 (Figure 13).

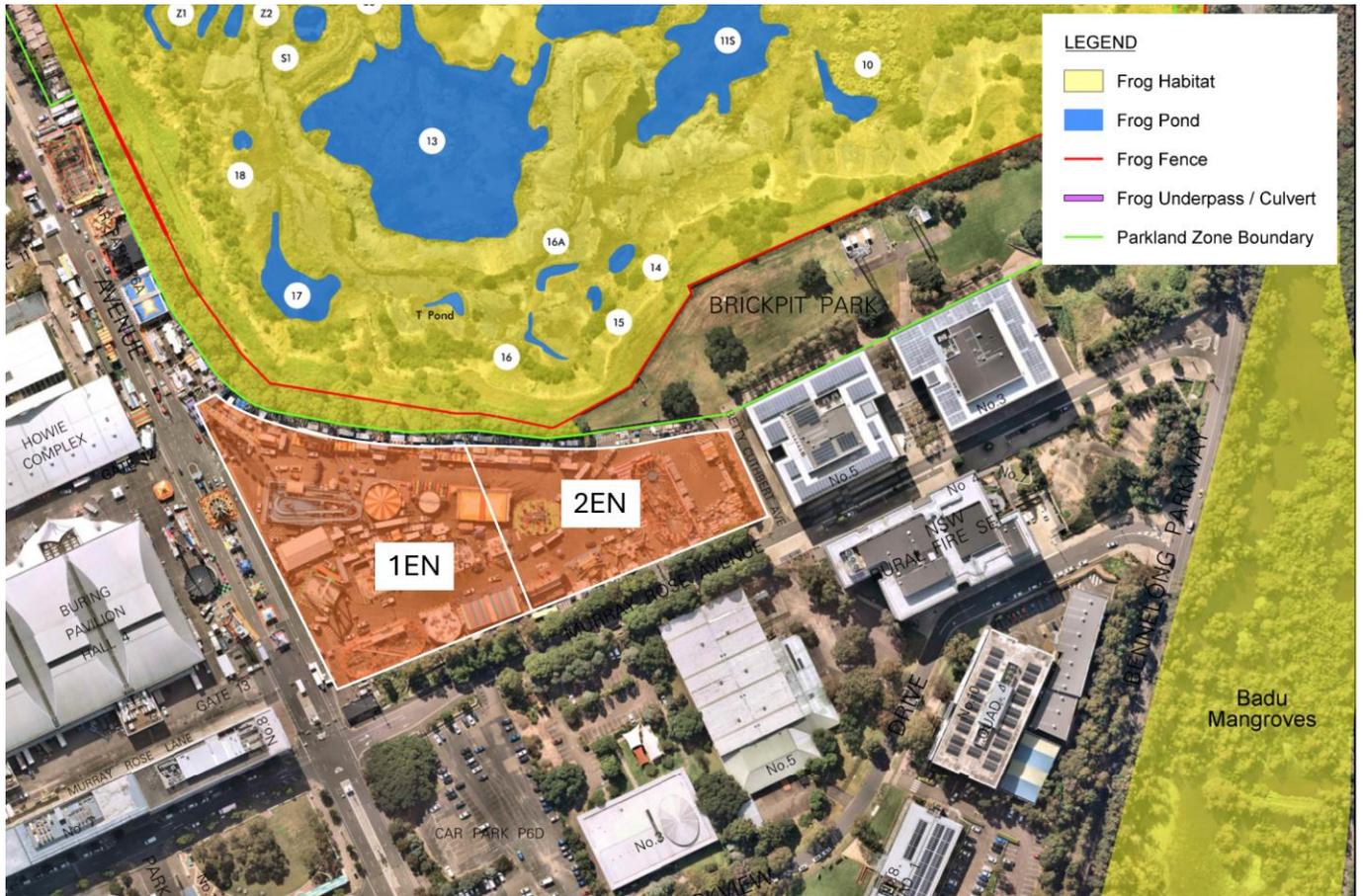
The Master Plan 2050 shows that transition from 'mixed use' to 'residential' (Figure 9). These residential areas are proposed for 'high to medium rise zones (13-24 storeys)'.

These two master plan sites are within the Rim and Grebe Pond catchment (Figure 11) and located immediately south of The Brickpit.

##### GGBF Habitat

During the development occurring in the 1990s leading up to the Sydney 2000 Olympic and Paralympic Games, a GGBF population was found at the former Brickpit site in Sydney Olympic Park. Since then, the design and development of the Park has been strongly influenced to conserve the GGBF population at The Brickpit. Therefore, The Brickpit site is considered an important habitat site for GGBF.

The 1EN and 2EN site locations are located immediately south of The Brickpit. The Master Plan 2050 has committed to maintaining at least 25 m from edge of the outer Brickpit fence in order to provide an ecological buffer.



**Figure 20 A snapshot of the Green and Golden Bell Frog Habitats map (Source: Sydney Olympic Park). Orange polygons depict Master Plan 2050 sites**

Lighting

The Brickpit is also mapped on the Dark Areas Map as ecologically sensitive land where light levels are low (~0.2 lux) (Figure 21). This means that lighting close to or within this area should be avoided to maintain the natural darkness required for ecological processes.



**Figure 21 A snapshot of the ‘Dark Areas’ map for the 1EN and 2EN Master Plan sites (Source: SOPA). Orange polygons depict Master Plan sites**

Migratory shorebirds

Latham’s Snipe (*G. hardwickii*) is a migratory shorebird that has been observed in The Brickpit. This species is considered ‘vulnerable’ in NSW and Nationally. Noise and lighting impacts are possible to this species as a result of development in at Master Plan 2050 locations 1EN and 2EN.

As the Master Plan 2050 proposes a ‘Tower zone (35-55 storeys)’ and ‘high to medium rise zone (13-24 storeys)’, the potential for migratory bird strikes due to the erection of multistorey buildings in the 1EN and 2 EN locations must be considered.

Potential direct and indirect impacts to biodiversity due to development within the proposed Eastern Neighbourhood (1EN, 2EN) are summarised in Table 7.

**Table 7 Summary of potential direct and indirect biodiversity impacts in the vicinity of the Eastern Neighbourhood (1EN, 2EN)**

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	NSW: Endangered <u>Commonwealth:</u> Vulnerable	Disturbance of habitat zones by humans.	Poor water quality due to construction runoff entering frog habitat.  Weed invasion and displacement due to spread of weeds from construction sites.

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>Spread of Chytrid fungus due to construction of human disturbance of habitat.</p> <p>Increases in fox, cat and rat predation due to increased residential occupation.</p> <p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to adjacent urban development.</p> <p>Pesticide use within the catchment.</p>
Dark Areas Map	N/A		<p>Construction works at night.</p> <p>Urban development increasing light levels due to light spill from new buildings.</p>
Migratory shorebirds	<p><u>NSW:</u> Protected under BC Act</p> <p><u>Commonwealth:</u> Protected under EPBC Act</p>	Bird strikes with structures, during construction or operation of multistorey buildings.	<p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to adjacent urban development.</p>

#### 4.2.4 PROPOSED EASTERN NEIGHBOURHOOD (3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN)

Locations '3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN' are part of the proposed Eastern Neighbourhood as part of the Master Plan 2050 (Figure 13) and part of the catchment that drains to Bennelong Pond (Figure 11).

There is a transition from 'mixed use' (existing) to 'residential' (Master Plan 2050) (Figure 9). These residential areas are proposed for 'low rise (2-4 storeys) to medium rise zones (5-12 storeys)' (Figure 10). These proposed low to medium rise zones are located within close proximity to Bennelong Pond and the Badu Mangroves (Figure 23).

##### GGBF Habitat

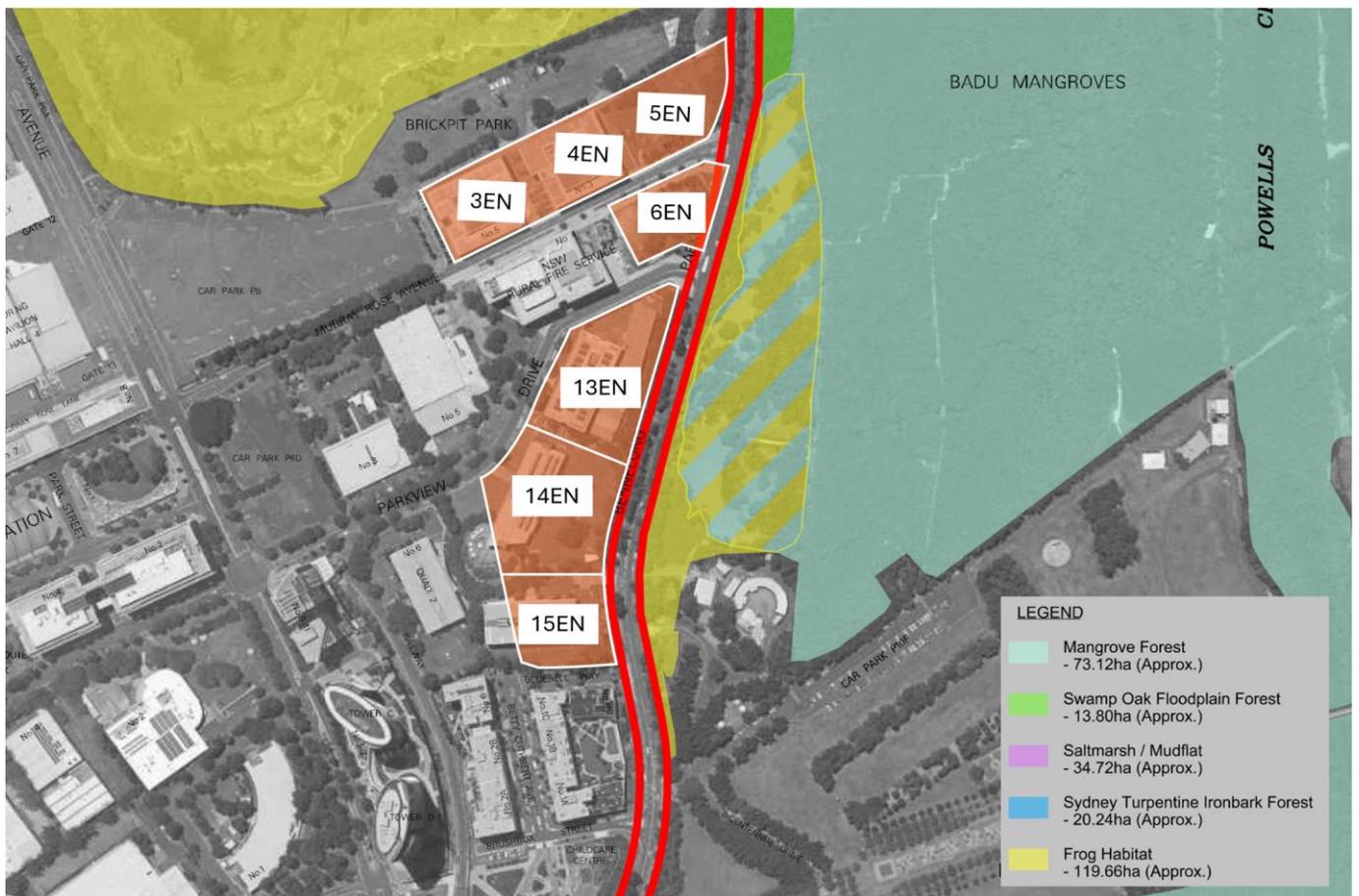
The adjacent Brickpit, Bennelong Pond and Badu Mangroves are mapped as GGBF habitat (Figure 22). These sites from the Eastern Neighbourhood are in the Bennelong Pond catchment (Figure 11).



**Figure 22 A snapshot of the 'Frog Habitats' map for the Eastern Neighbourhoods (Source: Sydney Olympic Park). Orange polygons depict Master Plan sites**

#### Mangrove forest

The Eastern Neighbourhood is also within close proximity of the Badu Mangroves, which contains mangrove forest (Figure 23). Mangrove forest is protected under the FM Act. Any works to harm marine vegetation (incl. mangroves) requires approval from NSW DPI Fisheries under s. 205 of the FM Act. Additionally, mangrove forest provides roosting and foraging habitat for migratory shorebirds.



**Figure 23 A snapshot of the threatened species habitats map for the Eastern Neighbourhood (Sydney Olympic Park). Orange polygons depict Master Plan sites**

Horned Pondweed (*Z. palustris*)

Bennelong Pond provides critical habitat for the endangered Horned Pondweed (*Zannichellia palustris*) which is only known to occur in Sydney Olympic Park and the Lower Hunter Region. (Refer to Appendix A – Map 11).

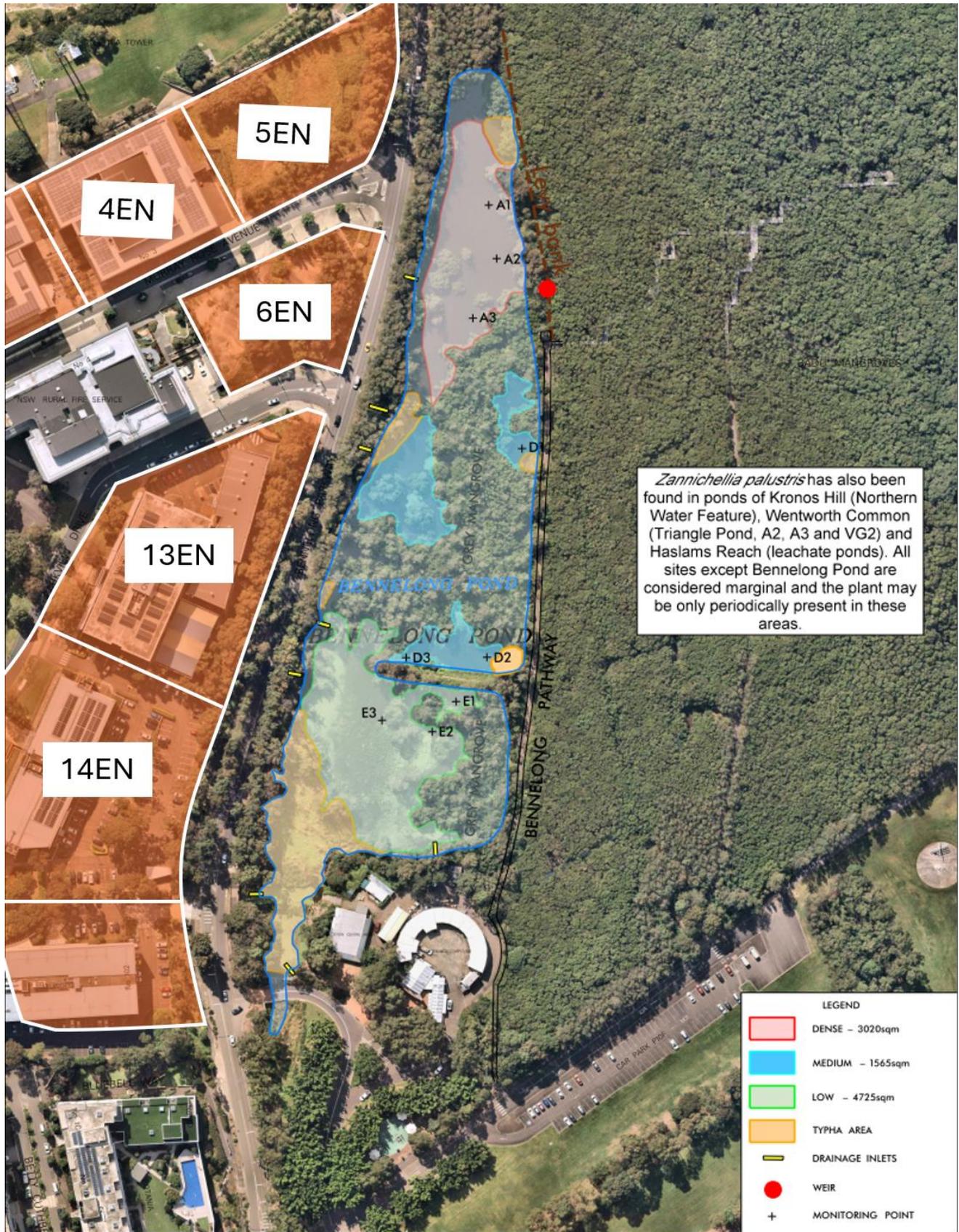


Figure 24 Markup of *Zannichellia palustris* distribution. Orange polygons depict Master Plan sites

Microbats

The DRAFT BMP 2025 contains the map of microbat roosts which identifies 'known maternity roosts', 'roosts' and 'potential microbat roosts'. The map shows that there is a potential microbat roost approximately 100 m northeast of the 5EN location.



**Figure 25 A snapshot of the 'Microbat Roosts and Maternity Roosts' map (Source: SOPA). Orange polygons depict Master Plan sites**

Migratory shorebirds

Migratory shorebirds mostly utilise saltmarsh and mudflats throughout Sydney Olympic Park as foraging and roosting habitat. Shorebirds have also been known to use the adjacent Brickpit and Badu Mangroves as roost sites and less frequently, as foraging sites. The proposed Eastern Neighbourhood is located immediately west of the Badu Mangroves and immediately south of The Brickpit, and therefore the potential impacts of development in this location must consider impacts to migratory shorebirds.

Lighting

Bennelong Pond / Badu Mangroves is also mapped on the Dark Areas Map as ecologically sensitive land where light levels are low (~0.2 lux) (Figure 26). This means that lighting close to or within this area should be avoided to maintain the natural darkness required for ecological processes.



**Figure 26 A snapshot of the Sydney Olympic Park Dark Areas map for the Eastern Neighbourhood (Source: SOPA). Orange polygons depict Master Plan sites**

Potential direct and indirect impacts to biodiversity due to development within the Eastern Neighbourhood (3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN) are summarised in Table 8.

**Table 8 Summary of potential direct and indirect biodiversity impacts in the vicinity of the Eastern Neighbourhood (3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN)**

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Horned Pondweed ( <i>Zannichellia palustris</i> )	NSW: Endangered Commonwealth: Not listed		Increased sedimentation, turbidity and nutrient loads due to construction runoff. Shadowing of water due to erection of new multi-storey buildings. Weed invasion and displacement due to spread of weeds from construction sites.
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	NSW: Endangered Commonwealth: Vulnerable	Disturbance of habitat zones by humans.	Poor water quality due to construction runoff entering frog habitat.

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>Overshadowing of basking habitat.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Spread of Chytrid fungus due to construction of human disturbance of habitat.</p> <p>Increases in fox, cat and rat predation due to increased residential occupation.</p> <p>Construction noise and/or noise due to public use.</p> <p>Increased light levels at night due to adjacent urban development.</p> <p>Pesticide use within the catchment.</p>
Microbats	<p><u>NSW:</u> Vulnerable (Southern Myotis, Eastern False Pipistrelle, Large Bent-winged Bat, Greater Broad-nosed Bat, and Little Bent-winged Bat)</p> <p><u>Commonwealth:</u> Not listed</p>		<p>Inappropriate lighting at roost sites due to development adjacent.</p> <p>Inappropriate use of pesticides near potential roost site.</p> <p>Changes to insect populations as a result of changes to insect habitat (i.e. vegetation removal, pest control, lighting).</p>
Mangrove forest	Protected in NSW (FM Act)	Trampling of pneumatophores & compacting of substrate due to uncontrolled public access.	<p>Shading of vegetation due to erection of new multistorey buildings in the vicinity.</p> <p>Construction runoff leading to increased nutrients levels in stormwater.</p> <p>New impervious areas due to development leading to increased</p>

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			nutrient levels in stormwater runoff.
Migratory shorebirds	<u>NSW:</u> Protected under BC Act  <u>Commonwealth:</u> Protected under EPBC Act	Bird strikes with structures, during construction or operation of multistorey buildings.	Increased light levels at night due to adjacent urban development.  Noise due to construction or uncontrolled public access.  Inappropriate hydrological regimes during September to March.  Increases in fox, cat and rat predation due to increased residential occupation.
Dark Areas Map	N/A	Construction works at night.	Urban development increasing light levels due to light spill from new buildings.

#### 4.2.5 NEWINGTON ARMORY

A number of upgrades are proposed indicatively in the Master Plan 2050 to the Newington Armory site (Figure 27) which shares a border with Newington Nature Reserve, including:

- New pedestrian paths on the northeastern side of the Armory site
- A First Nations's led space on the northeastern side of the site (within 50 m buffer to Newington Nature Reserve), approx. location of existing Murama Dance Ground
- A re-naturalised and expanded creekline with space for enhanced habitat values for Armory Creek
- New education and camping facilities adjacent to the BirdLife Australia Discovery Centre – only to occur >50 m from the Newington Nature Reserve Boundary
- Expanded built form (to provide better visual connection with Blaxland Riverside Park)
- Additional ecological buffer zones to Newington Nature Reserve
- Upgrades to open spaces adjacent to armaments bunkers, forming small breakout spaces for formal and informal uses
- New tree plantings
- Increased planting buffer to Jamieson Street to screen from Silverwater Correctional Complex.
- Retain the open grassland character and provide opportunities for native meadows and grassland character enhancement
- Retain significant views to historic buildings and ecological areas
- Additional amenities adjacent to upgraded recreation infrastructure
- Permanent ferry stop adjacent to the Armory Wharf
- Replacement fence which supports the heritage significance of the Armory



**Figure 27 Proposed Master Plan 2050 Newington Armory (Source: DRAFT Sydney Olympic Park Master Plan 2050)**

## GGBF

GGBF habitat is located throughout the Newington Armory site. The Sydney Olympic Park mapping indicates that Armory Creek and the area along the eastern boundary of the Armory is mapped as GGBF habitat.

Armory Creek is proposed for renaturalisation. As such, construction impacts to GGBF habitat will occur.

## Threatened ecological communities (TECs)

### Swamp Oak Floodplain Forest (SOFF)

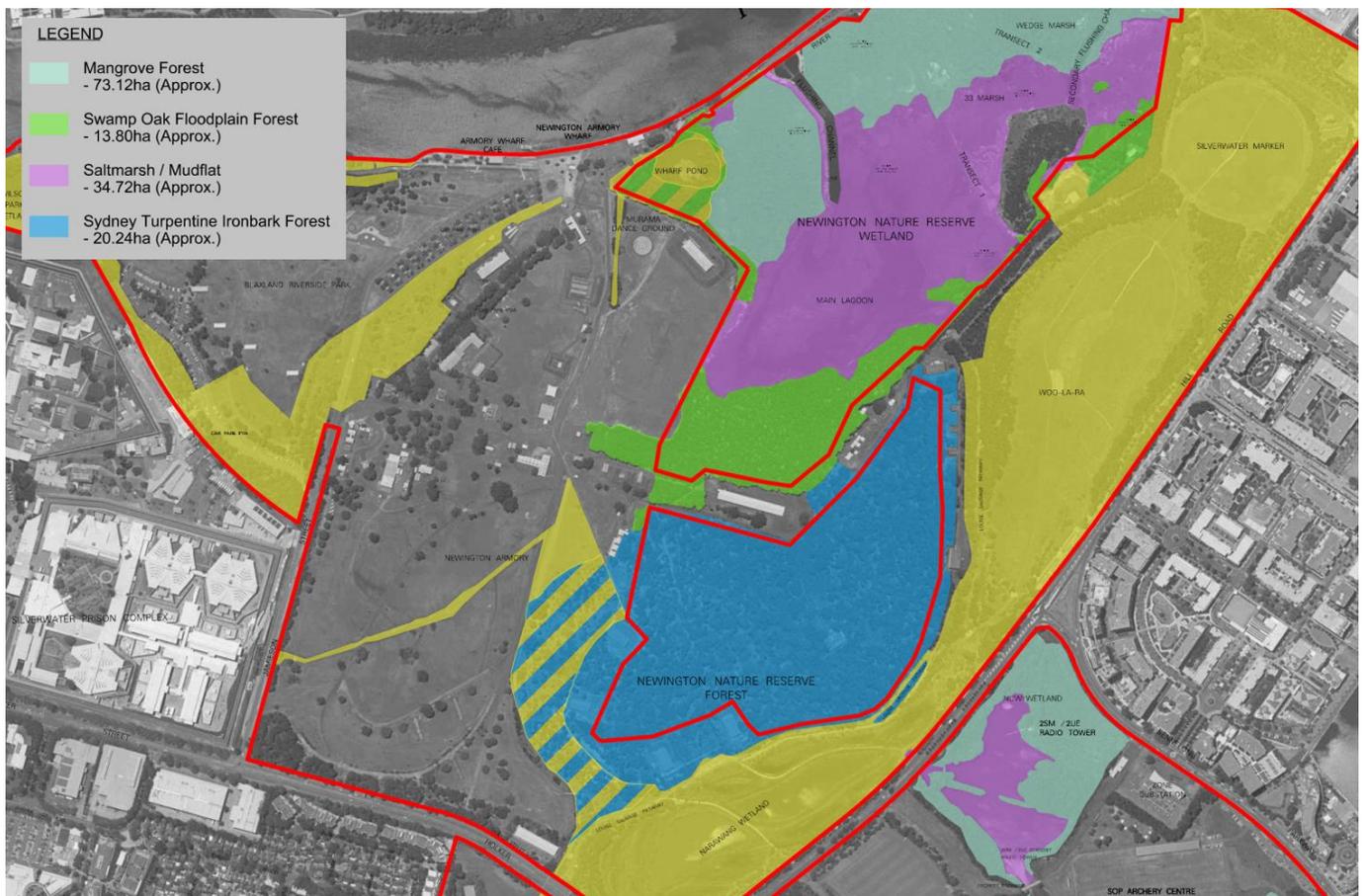
The threatened ecological community 'Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions' is located within the Armory site, on the northeastern boundary with the patch extending into Newington Nature Reserve (Figure 28).

### Sydney Turpentine-Ironbark Forest (STIF)

The threatened ecological community 'Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion' is located within the Armory site, on the southeastern boundary with the patch extending into Newington Nature Reserve (Figure 28).

### Coastal Saltmarsh/Coastal Wetlands

The endangered ecological community (EEC) 'Coastal saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' is located immediately east of the Armory site (Figure 28). Similarly, this area is also mapped as 'Coastal Wetlands' under the R&H SEPP (Figure 4). This map also indicates that a portion of the proposed development zone sits within the 'Proximity Area for Coastal Wetlands'. Requirements of the R&H SEPP must be considered for developments within the proximity area.



**Figure 28 A snapshot of the Sydney Olympic Park Threatened Species Map with a focus on the Newington Armory Precinct (Source: Sydney Olympic Park)**

Microbats

The DRAFT BMP contains the map of microbat roosts (Refer to Map 20 of the DRAFT BMP) which identifies 'known maternity roosts', 'roosts' and 'potential microbat roosts'. The map shows that there are three microbat roost sites and one known maternity roost between approximately 150-300 m east of the proposed development area within the Armory site boundary.

Mangrove forest

Given the close proximity of Newington Nature Reserve there are potential impacts to mangrove forest to consider. Mangrove forest is focus species included in Sydney Olympic Park's DRAFT BMP (2025). Mangrove forest is protected under the FM Act. Any works to harm marine vegetation (incl. mangroves) requires approval from NSW DPI Fisheries under s. 205 of the FM Act.

Migratory shorebirds

Given the close proximity of Newington Nature Reserve and the large diversity and abundance of migratory shorebirds using The Reserve, there are potential impacts to this protected group of avian fauna be considered. Migratory shorebirds are protected under the EPBC Act as well as international conservation agreement such as JAMBA, ROKAMBA and CAMBA. A number of birds are also protected under the BC Act.

Lighting

The Dark Areas Map (Appendix A – Map 21) has also been consulted with reference to the potential works conducted at the Armory site. The mapping indicates that there is a low light level area within the southeastern area of the precinct, meaning that light levels are typically ~0.2 lux in this zone. The area of the along the northeastern boundary, however, has been mapped as 'moderate to high' light levels.

A summary of potential impacts due to the proposed works that may be conducted following the Master Plan 2050 at the Newington Armory site are provided in Table 9.

**Table 9 Summary of potential direct and indirect biodiversity impacts due to the Master Plan 2050 in the vicinity of the Newington Nature Reserve**

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	<u>NSW:</u> Endangered <u>Commonwealth:</u> Vulnerable	Disturbance of habitat zones by humans.	Poor water quality due to construction runoff entering frog habitat.  Weed invasion and displacement due to spread of weeds from construction sites or public access.  Spread of Chytrid fungus due to construction of human disturbance of habitat.  Construction noise and/or noise due to increased public use.  Increased light levels due to expanding built form, education camping facilities

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>and/or pedestrian paths (if lighting is proposed).</p> <p>Pesticide use within the catchment.</p>
<p>Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions</p>	<p><u>NSW:</u> Endangered</p> <p><u>Commonwealth:</u> Endangered</p>	<p>Collection of wood for campfires.</p>	<p>Stormwater runoff from construction sites or new impervious surfaces, leading to increased nutrients and litter debris.</p> <p>Erosion or sedimentation due to stormwater runoff from construction or new impervious surfaces.</p> <p>Spread of weeds from construction sites/vehicles in close proximity to STIF, particularly susceptibility to <i>Juncus acutus</i> and Common couch (<i>Cynodon dactylon</i>).</p> <p>Uncontrolled public access leading to dumping, vegetation degradation or vegetation removal.</p> <p>Light spill due to adjacent camping activities.</p> <p>Noise due to adjacent camping activities.</p> <p>Wildfires due result from adjacent camping.</p>
<p>Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion</p>	<p><u>NSW:</u> Critically Endangered</p> <p><u>Commonwealth:</u> Critically Endangered</p>	<p>Collection of wood for campfires.</p>	<p>Stormwater runoff from construction sites or new impervious surfaces, leading to increased nutrients and litter debris.</p> <p>Spread of weeds from construction sites/vehicles in close proximity to STIF.</p> <p>Spread of disease/pathogens, such as Phytophthora and Myrtle Rust from uncontrolled public</p>

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>access or construction sites.</p> <p>Light spill due to adjacent camping activities.</p> <p>Noise due to adjacent camping activities.</p> <p>Wildfires due result from adjacent camping.</p>
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	<p><u>NSW</u>: Endangered</p> <p><u>Commonwealth</u>: Not listed</p>	Uncontrolled public access leading to habitat destruction (i.e. trampling vegetation etc)	<p>Construction runoff leading to sedimentation or erosion of downstream coastal saltmarsh.</p> <p>Stormwater discharge leading to freshwater pools or channels that lead to vegetation dieback.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Increase nutrients levels due to stormwater runoff from new impervious surfaces from urban development.</p>
Microbats	<p><u>NSW</u>: Vulnerable (Southern Myotis, Eastern False Pipistrelle, Large Bent-winged Bat, Greater Broad-nosed Bat, and Little Bent-winged Bat)</p> <p><u>Commonwealth</u>: Not listed</p>		<p>Inappropriate lighting at roost sites due to proposed education/camping facilities, expanded built forms or new pedestrian paths (if lighting is proposed).</p> <p>Inappropriate use of pesticides near potential roost site.</p> <p>Changes to insect populations as a result of changes to insect habitat (i.e. vegetation removal, pest control, lighting).</p>

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Mangrove forest	Protected in NSW (Fisheries Management Act 1994)	Trampling of pneumatophores & compacting of substrate due to uncontrolled public access.	Construction runoff leading to increased nutrients levels in stormwater. New impervious areas due to development leading to increased nutrient levels in stormwater runoff.
Migratory shorebirds	Nationally important (protected under EPBC Act, BC Act and numerous international conservation agreements)	Uncontrolled public access due to increase use in site surrounds.	Construction noise. Lighting provided on paths close to Newington Nature Reserve.
Dark Areas Map	N/A		Construction work at night. Increasing light levels due to light spill from new paths, education/camping facilities, and expanding built form.

#### 4.2.6 WOO-LA-RA PRECINCT

The Master Plan 2050 proposes a new multi-purpose local park at the northern end of Woo-la-ra between the Silverwater marker and Wattlebird Road, consisting of:

- New multipurpose sports courts
- New volleyball courts
- New pickleball / badminton courts
- Lighting to the various new courts
- New seating
- Installing smart poles/power points for community events
- New lawn areas
- New flat areas (for active or passive recreation)
- WSUD measures
- Fenced dog-off-leash area
- New playground including nature play elements
- New native trees and soft landscaping consistent with vegetation communities of the adjacent Newington Nature Reserve
- Providing habitat opportunities

Within the Woo-la-ra Precinct the following is also proposed by the Master Plan 2050 at the location on the top of the large mound:

- New flat, hardstand area
- New destination play space
- New seating
- New shade structure
- New tree planting consistent with vegetation communities of the adjacent Newington Nature Reserve



**Figure 29 Proposed Woo-la-ra Precinct (Source: Master Plan 2050)**

GGBF Habitat

The entire Woo-la-ra Precinct is mapped as GGBF habitat, according to Sydney Olympic Park's Frog Habitats Map (Figure 30). Therefore, works in this area would need to adequately consider impacts to frogs during construction and operation of the proposal.



**Figure 30 A snapshot of Sydney Olympic Park's Frog Habitats Map with a focus on the Woo-la-ra Precinct**

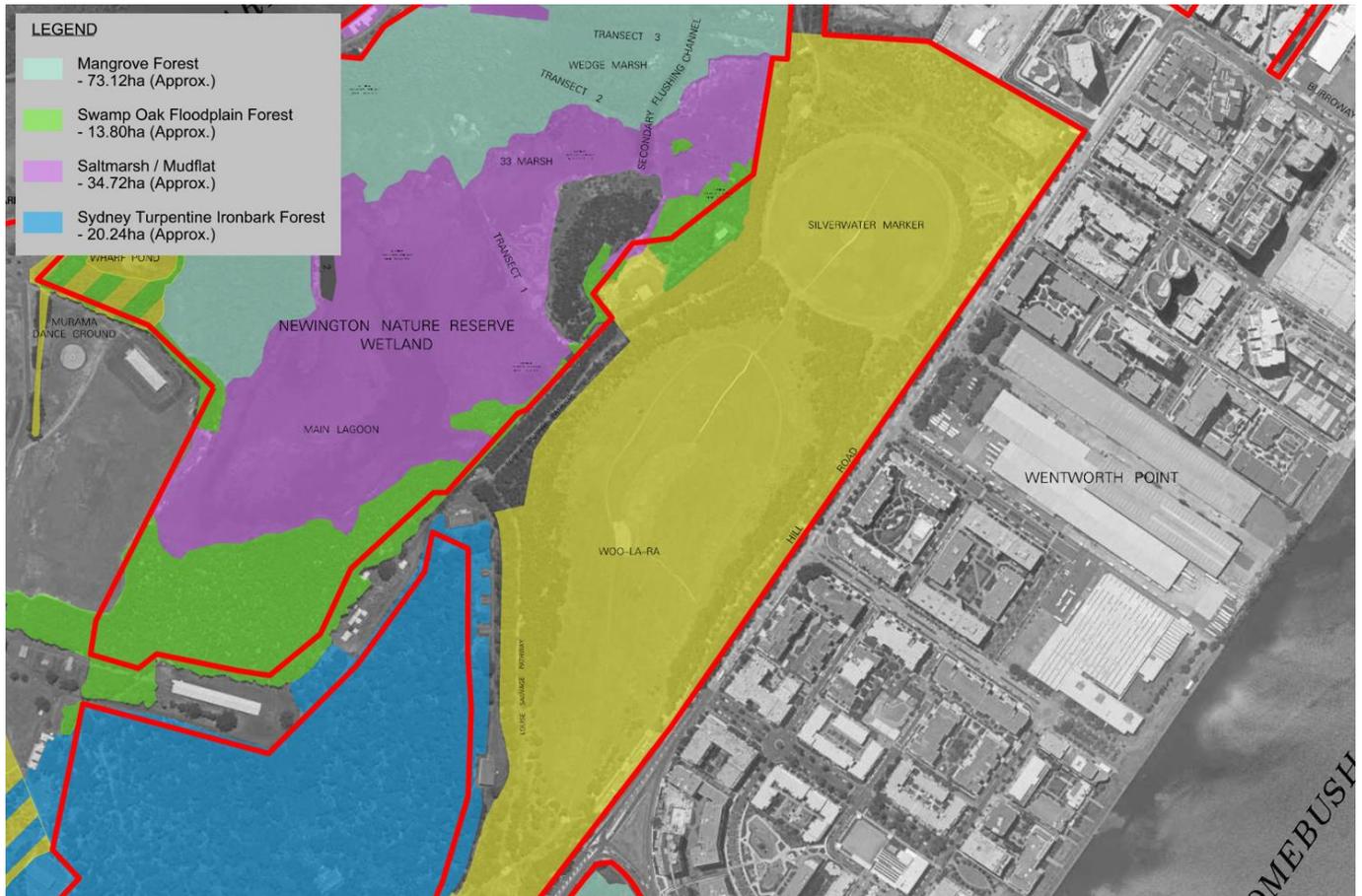
Threatened ecological communities (TECs)

*Sydney Turpentine-Ironbark Forest (STIF)*

The threatened ecological community 'Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion' (STIF) is located within Newington Nature Reserve, on the south-western boundary of the Woo-la-ra Precinct (Figure 31). This patch of STIF would be located downstream of the proposed works on the top of the mounds.

*Coastal Saltmarsh/Coastal Wetlands*

The endangered ecological community (EEC) 'Coastal saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' is located on the western boundary of the Woo-la-ra Precinct within Newington Nature Reserve (Figure 31). Similarly, this area is also mapped as 'Coastal Wetlands' under the R&H SEPP (Figure 4). These locations could be located downstream of the proposed works for the northern side of the Woo-la-ra Precinct.



**Figure 31 A snapshot of the Sydney Olympic Park Threatened Species Map with a focus on the Woo-la-ra Precinct**

Mangrove forest

Mangrove forest is focus species included in Sydney Olympic Park's DRAFT BMP (2025). Mangrove forest is protected under the FM Act. Direct impacts to mangrove forest are not anticipated as part of the uses proposed in the Woo-la-ra Precinct. However, any works to harm marine vegetation (incl. mangroves) requires approval from NSW DPI Fisheries under s. 205 of the FM Act.

Migratory shorebirds

Given the close proximity of Newington Nature Reserve and the large diversity and abundance of migratory shorebirds using The Reserve, there are potential impacts to this protected group of avian fauna be considered. Migratory shorebirds are protected under the EPBC Act as well as international conservation agreement such as JAMBA, ROKAMBA and CAMBA. A number of birds are also protected under the BC Act.

Lighting

The Sydney Olympic Park Dark Areas Map (Appendix A – Map 21) has also been consulted with reference to the potential works conducted at the northeastern recreation area. The mapping indicates that there is a low light level area within the southeastern area of the precinct, meaning that light levels are typically ~0.2 lux in this zone. The area of the along the northeastern boundary, however, has been mapped as 'moderate to high' light levels.

**Table 10 Summary of potential direct and indirect biodiversity impacts due to the Master Plan 2050 in the vicinity of the Newington Nature Reserve**

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	<u>NSW:</u> Endangered <u>Commonwealth:</u> Vulnerable	Disturbance of habitat zones by humans.	<p>Poor water quality due to construction runoff entering frog habitat.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites and/or public use.</p> <p>Spread of Chytrid fungus due to construction of human disturbance of habitat.</p> <p>Construction noise and/or noise due to public use.</p> <p>Increased light levels due to lighting to proposed multipurpose sports courts.</p> <p>Pesticide use within the catchment.</p>
Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	<u>NSW:</u> Critically Endangered <u>Commonwealth:</u> Critically Endangered		<p>Stormwater runoff from construction sites or new impervious surfaces, leading to increased nutrients and litter debris.</p> <p>Spread of weeds from construction sites/vehicles in close proximity to STIF.</p> <p>Spread of disease/pathogens, such as Phytophthora and Myrtle Rust from uncontrolled public access or construction sites.</p>
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	<u>NSW:</u> Endangered <u>Commonwealth:</u> Not listed	Uncontrolled public access leading to habitat destruction (i.e. trampling vegetation etc)	<p>Construction runoff leading to sedimentation or erosion of downstream coastal saltmarsh.</p> <p>Stormwater discharge leading to freshwater pools or channels that</p>

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
			<p>lead to vegetation dieback.</p> <p>Weed invasion and displacement due to spread of weeds from construction sites.</p> <p>Increase nutrients levels due to stormwater runoff from new impervious surfaces from urban development.</p>
Mangrove forest	Protected in NSW (Fisheries Management Act 1994)	Trampling of pneumatophores & compacting of substrate due to uncontrolled public access.	<p>Construction runoff from northern area of works leading to increased nutrients levels in stormwater.</p> <p>New impervious areas in northern area of works due to development leading to increased nutrient levels in stormwater runoff</p>
Migratory shorebirds	Nationally important (protected under EPBC Act, BC Act and numerous international conservation agreements)	Uncontrolled public access due to increase use in site surrounds.	<p>Construction noise.</p> <p>Lighting provided on paths close to Newington Nature Reserve.</p>
Dark Areas Map	N/A		<p>Construction works at night.</p> <p>Urban development increasing light levels due to light spill from new buildings.</p>

#### 4.2.7 RECREATION – GENERAL

It has been observed that as part of The Master Plan 2050, there are potential indirect impacts due to increased passive and active recreation throughout Sydney Olympic Park as a result of increased population size and increasing demands for access.

There are a number of existing paths through mapped threatened species habitats:

- Kronos Hill
- The Brickpit Ring Walk
- Wentworth Common
- Badu Mangroves

- Narawang Wetlands
- Haslams Creek corridor
- Waterbird Refuge perimeter
- Northern Water Feature southern boundary
- Bennelong Pond (eastern boundary)
- Newington Nature Reserve forest and wetland perimeter (Louise Savage Pathway and Parramatta River Walk)
- Woo-la-ra Precinct

There are also new paths proposed within or close to mapped threatened species habitat as part of the Master Plan 2050:

- Newington Armory Precinct (Armory Gallery area) – adjacent Newington Nature Reserve
- Northern Water Feature northern boundary – within frog habitat north of NWF

As such, the potential impacts in Table 11 have been identified as a result of increased use of the parklands for passive and active recreation.

**Table 11 Summary of potential direct and indirect biodiversity impacts due to increased passive and active recreation as a result of implementation of the Master Plan 2050**

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Green and Golden Bell Frog ( <i>Ranoidea aurea</i> )	<u>NSW:</u> Endangered <u>Commonwealth:</u> Vulnerable	Disturbance of habitat zones by humans.  Proposed new path to northern perimeter of NWF.	Poor water quality due to construction runoff entering frog habitat.  Weed invasion and displacement due to spread of weeds public use.  Spread of Chytrid fungus due to construction of human disturbance of habitat.  Increased light levels due to lighting to proposed multipurpose sports courts.  Increased light levels due to lighting of paths.
Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion	<u>NSW:</u> Critically Endangered <u>Commonwealth:</u> Critically Endangered		Weed invasion and displacement due to spread of weeds public use.  Spread of disease/pathogens, such as Phytophthora and Myrtle Rust from uncontrolled public access.

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	<u>NSW:</u> Endangered <u>Commonwealth:</u> Not listed	Uncontrolled public access leading to habitat destruction (i.e. trampling vegetation etc).	Weed invasion and displacement due to spread of weeds public use.
Mangrove forest	Protected in NSW (Fisheries Management Act 1994)	Trampling of pneumatophores & compacting of substrate due to uncontrolled public access.	
Migratory shorebirds	Nationally important (protected under EPBC Act, BC Act and numerous international conservation agreements)	Uncontrolled public access due to increase use in site surrounds.	Noise due to increase public use near habitat areas.  Lighting provided on paths close to habitat areas.  Increases in fox, cat and rat predation due to increased residential occupation.
Woodland birds	<u>NSW:</u> Endangered (Swift Parrot)  Vulnerable (Flame Robin, Scarlet Robin) <u>Commonwealth:</u> Critically Endangered (Swift Parrot)	Disturbance to birds, and damage to habitat including nest sites by uncontrolled public access, off-lead dogs, or inappropriate authorised access.	Weed invasion and displacement due to spread of weeds public use.  Noise due to public use.  Increased light levels due to lighting to adjacent new paths.  Increases in fox, cat and rat predation due to increased residential occupation.
Microbats	<u>NSW:</u> Vulnerable (Southern Myotis, Eastern False Pipistrelle, Large Bent-winged Bat, Greater Broad-nosed Bat, and Little Bent-winged Bat) <u>Commonwealth:</u> Not listed		Inappropriate lighting at roost sites due to proposed education/camping facilities, expanded built forms or new pedestrian paths (if lighting is proposed).  Changes to insect populations as a result of changes to insect habitat (i.e. new lighting).

Species, ecological community or habitat of concern	Conservation status	Potential direct impacts	Potential indirect impacts
Dark Areas Map	N/A		Urban development increasing light levels due to light spill from new paths.

# 5 RECOMMENDATIONS

## 5.1 MITIGATION MEASURES

The desktop analysis (Section 4 of this report) of the Master Plan 2050 and the biodiversity mapping of Sydney Olympic Park determined that:

- There are six locations where indirect biodiversity impacts may occur
- Potential indirect impacts for species, habitats or ecological communities with high ecological value including focus species from the DRAFT Sydney Olympic Park Biodiversity Management Plan 2025

The following section provides measures to be implemented prior to, during and post-construction of proposed master plan actions. Implementation measures have been categorised as “avoid” or “minimise” measures.

“Avoid” measures are those measures that outline areas that cannot be entered or disturbed when doing works in the precinct (i.e. no-go zones).

“Minimise” measure are those measures to be implemented to minimise impacts when completing works identified in the Master Plan 2050 (i.e. any lit structures to comply with National Light Pollution Guidelines for Wildlife).

### 5.1.1 PROPOSED HASLAM'S NEIGHBOURHOOD

The proposed Haslams Neighbourhood is located on the southwestern side of Sydney Olympic Park, on Hill Road between Pondage Link and Old Hill Link (Figure 13). The proposed Master Plan 2050 indicates that in the future this area is to be a residential area consisting of 'low rise (2-4 storeys) to medium rise zones (5-12 storeys)'.

The desktop analysis found that there are possible impacts to biodiversity for works conducted at the 4HN, 5HN and 6HN locations within Haslams Neighbourhood (Figure 13). In order to minimise impacts to biodiversity the following implementation measures have been determined.

#### Avoid

- Works located in the Master Plan 2050 sites 4HN, 5HN and 6HN (Haslams Neighbourhood) are to ensure that no go zones are established for the following areas:
  - o GGBF Habitat: The area at and surrounding the Northern Water Feature, as shown in yellow in Figure 14
- No decorative lighting of the buildings or structures proposed in the Haslams Neighbourhood to avoid lighting impacts to dark areas as shown on the Dark Areas map (Figure 18)

#### Minimise

The following measures are to be implemented at various stages of actioning the Master Plan in order to minimise impacts of development:

- Prevent poor water quality discharge from construction sites to Coastal Saltmarsh (EEC) and GGBF habitat from construction in the catchment by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy', including:
  - o Diverting all construction flows away from saltmarsh and GGBF habitat wherever possible
  - o Where diversion away from GGBF habitat is not possible adopting sediment erosion controls consistent with Sydney Olympic Park's guidelines and NSW Blue Book

- Inspecting (and rectifying) sediment and erosion controls weekly or after >5mm rainfall
- Implement SOPA's Environmental Procedure as outlined in the Attachment 2, Section 2.1 'Works in or near habitats' of the DRAFT BMP 2025 (Refer to Appendix B)
- Prepare an obtrusive light assessment for proposed buildings, structures or paths to be lit to ensure dark areas are maintained as per the Dark Areas Map (Figure 16) and National Light Pollution Guidelines for Wildlife (DCCEE, 2023)
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise is not to exceed baseline levels
- For prolonged nighttime construction works (works which occur for more than 2 hours a night and for more than 1 week) a lighting plan and obtrusive lighting assessment is to be developed and reviewed by an ecologist for potential impacts and impacts are to be minimised to acceptable levels
  - Nighttime construction works are limited to a curfew of 10 pm to ensure 8 hours of natural darkness
  - Where a potential impact to threatened fauna is identified by the ecologist mitigation measures are to be adopted consistent with the assessment and mitigation measures as outlined in the *National Light Pollution Guidelines for Wildlife* (Australian Government, 2023)
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Construction and operation of new buildings, structures or paths to be lit in Haslams Neighbourhood must comply with National Light Pollution Guidelines for Wildlife (DCCEE, 2023) to minimise lighting impacts to Dark Areas by:
  - preventing the use of decorative lighting on new buildings or structures
  - preventing the use of upward facing lighting or lighting facing The Northern Water Feature and Haslams Creek corridor
  - utilising fully shielded luminaires
  - utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq 3000\text{K}$ )
  - utilising timed lighting control systems to maintain 8 hours of darkness
  - establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEE, 2023)

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

### 5.1.2 PROPOSED STADIA PRECINCT

The proposed Stadia Precinct is located north of the Olympic Park train station and immediately south of Kronos Hill, bound by Kevin Coombs Ave, Olympic Blvd, Australia Ave and Grand Parade (Figure 13). The desktop analysis has identified potential biodiversity impacts for works conducted in the Stadia Precinct in the '4ST, 7ST, 9ST' locations.

The Master Plan 2050 proposes the Stadia Precinct as 'mixed use' and 'events and sport' land uses. The Master Plan proposes a Tower zone (25-55 storeys) with a 'Key Tower' at 4ST which has been defined as 35-55 storeys. One half of 4ST is proposed as a 'medium rise zone (5-12 storeys)'. The remaining locations 7ST and 9ST are low rise zones which are to be constrained to 2-4 storeys high.

The desktop analysis found that there are potential impacts to GGBF, woodland birds, migratory shorebirds, Horned Pondweed, microbats, dark areas. The following "avoid" and "minimise" implementation measures have been identified for works carried out in the 4ST, 7ST and 9ST sites.

## Avoid

- Works located in the Master Plan 2050 sites 4ST, 7ST and 9ST (Stadia Precinct) are to ensure that no go zones are established for the following area/s:
  - o GGBF Habitat: The area at and surrounding the Northern Water Feature and Kronos Hill, as shown in yellow in Figure 17
- No decorative lighting of the buildings or structures proposed in the Stadia Precinct to avoid lighting impacts to dark areas as shown on the Dark Areas map (Figure 18)

## Minimise

The following measures are to be implemented at various stages of actioning the Master Plan in order to minimise impacts of development:

- To minimise impacts, the Northern Water Feature supplementary treatment works identified in the *Master Plan 2050 Water Management Technical Report* are implemented prior to any construction works undertaken for Stadia Precinct
- For any construction in the Stadia Precinct quarterly inspections and reporting by a BOS certified ecologist is to be undertaken in the Northern Water Feature during the entire period of construction including monitoring for prior to construction
- For any construction in the Stadia Precinct quarterly inspections and reporting of the existing Northern Water Feature WSUD assets (wetland and inlet pond and GPT) is to be undertaken by a suitable qualified and practicing WSUD engineer during construction
- Prevent poor water quality discharge from construction sites to Coastal Saltmarsh (EEC) and GGBF habitat from construction in the catchment by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy'
- Divert all construction flows away from saltmarsh and GGBF habitat
- Inspecting (and rectifying) sediment and erosion controls weekly or after >5mm rainfall
- Implement Sydney Olympic Park's Environmental Procedure as outlined in the Attachment 2, Section 2.1 'Works in or near habitats' of the DRAFT BMP 2025 (Refer to Appendix B)
- Prepare an obtrusive light assessment for proposed buildings, structures or paths to be lit to ensure dark areas are maintained as per the Dark Areas Map (Figure 18) and light levels do not impact on the potential microbat roost site (Figure 19)
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise is not to exceed baseline levels
- For prolonged nighttime construction works (works which occur for more than 2 hours a night and for more than 1 week) a lighting plan and obtrusive lighting assessment is to be developed and reviewed by an ecologist for potential impacts and impacts are to be minimised to acceptable levels
  - o Nighttime construction works are limited to a curfew of 10 pm to ensure 8 hours of natural darkness
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Construction and operation of new buildings, structures or paths to be lit in the Stadia Precinct must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) to minimise lighting impacts to Dark Areas by:
  - o preventing the use of decorative lighting on new buildings or structures
  - o preventing the use of upward facing lighting or lighting facing The Northern Water Feature, Kronos Hill and The Brickpit
  - o utilising fully shielded luminaires

- utilising LEDs with appropriate colour corrected temperatures for wildlife (nom. ≤ 3000K)
- utilising timed lighting control systems to maintain 8 hours of darkness
- establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)
- Protect woodland bird habitat by
  - Preventing the spread of weeds from the site by ensuring trucks, machinery and workers do not leave the site with plant propagules attached
  - Disposing of weeds appropriately
  - Covering all wastes leaving the site, including any green waste

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

### 5.1.3 PROPOSED EASTERN NEIGHBOURHOOD (1EN, 2EN)

The Master Plan 2050 sites 1EN and 2EN are part of the proposed Eastern Neighbourhood. The Eastern Neighbourhood is located on the southeastern side of Sydney Olympic Park (Figure 13). The existing sites are currently used as one of Sydney Olympic Park's major carparks. The sites are also utilised annually as the Royal Sydney Easter show.

The Master Plan 2050 proposes a 'Tower zone (25-55 storeys)' for the 1EN location and a 'High to medium rise zone (13-24 storeys)' for the 2EN location. 1EN is proposed as 'mixed use' and 2EN is proposed as residential land.

The desktop analysis found that the 1EN and 2EN locations are within the 'Rim and Grebe Pond' catchment, and are located immediately south of The Brickpit. This catchment is part of the system that prevents water from entering The Brickpit under DA S38/14/97.

The Brickpit is important habitat for the GGBF and is also mapped on the Dark Areas map as a low light level area (Figure 21). Lighting in or adjacent to this area should look to maintain 0.2 lux in the area.

Latham's Snipe (*G. hardwickii*) is a migratory shorebird that has been observed in The Brickpit. This species is considered 'vulnerable' in NSW and Nationally. Therefore, potential impacts to this species should be considered for development adjacent to The Brickpit.

The following "avoid" and "minimise" implementation measures have been identified for works carried out at the 1EN and 2EN sites.

#### Avoid

- Works located in the Master Plan 2050 sites 1EN and 2EN (Eastern Neighbourhood) are to ensure that no-go zones are established for the following area/s:
  - The Brickpit, GGBF habitat as shown in yellow in Figure 20
  - The Brickpit Ecological Buffer – 25 m wide from The Brickpit fence
- No decorative lighting is to be used on new buildings and structures in the Eastern Neighbourhood to avoid lighting impacts to dark areas as shown on the Dark Areas map
- No water is to discharge into The Brickpit at any time

#### Minimise

The following measures are to be implemented at various stages of actioning the Master Plan in order to minimise impacts of development:

- Prevent poor water quality discharge from construction sites to GGBF habitat from construction in the catchment by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy', including:
  - Diverting all construction flows away from GGBF habitat
  - Inspecting (and rectifying) sediment and erosion controls weekly or after >5mm rainfall

- Implement Sydney Olympic Park's Environmental Procedure as outlined in the Attachment 2, Section 2.1 'Works in or near habitats' of the DRAFT BMP 2025 (Refer to Appendix B)
- Developer to prepare an obtrusive light assessment for proposed buildings, structures or paths to be lit to ensure dark areas are maintained as per the Dark Areas Map (Figure 21)
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise is not to exceed baseline levels
- For prolonged nighttime construction works (works which occur for more than 2 hours a night and for more than 1 week) a lighting plan and obtrusive lighting assessment is to be developed and reviewed by an ecologist for potential impacts and impacts are to be minimised to acceptable levels
  - o Nighttime construction works are limited to a curfew of 10 pm to ensure 8 hours of natural darkness
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Construction and operation of new buildings, structures or paths to be lit in the Eastern Neighbourhood must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) to minimise lighting impacts to Dark Areas by:
  - o preventing the use of decorative lighting on new buildings or structures
  - o preventing the use of upward facing lighting or lighting facing The Brickpit
  - o utilising fully shielded luminaires
  - o utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq 3000\text{K}$ )
  - o utilising timed lighting control systems to maintain 8 hours of darkness
  - o establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

#### 5.1.4 PROPOSED EASTERN NEIGHBOURHOOD (3EN, 4EN, 5EN, 6EN, 13EN, 14EN, 15EN)

The Master Plan 2050 sites 3EN, 4EN, 5EN, 6EN, 13EN, 14EN, and 15EN are part of the proposed Eastern Neighbourhood (Figure 13) and within the catchment draining to Bennelong Pond (Figure 11).

Bennelong Pond is an important habitat feature for flora and fauna providing:

- Habitat for the endangered (in NSW) Horned pondweed (*Zannichellia palustris*)
- Habitat for the endangered (in NSW) Green and Golden Bell Frog (GGBF) (*Ranoidea aurea*)
- Open water habitat for avian fauna

The area east of these Master Plan 2050 sites is mapped on the Dark Areas map as ecologically sensitive land where light levels are low (~0.2 lux) (Figure 26).

According to Sydney Olympic Park microbat roosts map there is a potential roost located approximately 100 m northeast of the 5EN location (Figure 25). The open water of Bennelong Pond would likely also provide some foraging habitat for microbats.

Adjacent to the site is also the important Badu Mangroves which provide habitat for many fauna species, including mullet, prawns, molluscs and crabs, as well as the bacteria and fungi that breakdown.

The Master Plan proposes 'residential' land uses for all sites within the Eastern Neighbourhood, except for 14EN which is proposed as 'mixed use'. The building heights plan as shown in the Master Plan proposes:

- 'High to medium rise zone (13-24 storeys)' for locations 3EN, 4EN and 5 EN

- 'Medium rise (5-12 storeys)' for 6EN, 13EN, 14EN and 15EN

Given the multistorey buildings proposed in these zones, and the high diversity of migratory shorebirds observed at Sydney Olympic Park, potential impacts to this fauna should be considered.

The following "avoid" and "minimise" implementation measures have been identified for works carried out at the 3EN, 4EN, 5EN, 6EN, 13EN, 14EN, and 15EN sites.

#### Avoid

- Works located in the Master Plan 2050 sites 13EN, 4EN, 5EN, 6EN, 13EN, 14EN, and 15EN (Eastern Neighbourhood) are to ensure that no-go zones are established for the following area/s:
  - o Bennelong Pond,
  - o Badu Mangroves
- No decorative lighting is to be used on new buildings and structures in the Eastern Neighbourhood to avoid lighting impacts to dark areas as shown on the Dark Areas map
- No water is to discharge into The Brickpit at any time

#### Minimise

The following measures are to be implemented at various stages of actioning the Master Plan in order to minimise impacts of development:

- Protect Bennelong Pond from poor water quality due to construction by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy', including:
  - o Ensure all construction flows are connected to the stormwater system upstream of the existing treatment systems on Bennelong Parkway
  - o Ensuring sediment and erosion controls are implemented in accordance with the Sydney Olympic Park WSUD Guidelines
  - o Inspecting (and rectifying) sediment and erosion controls weekly or after >5mm rainfall
- Prior to any construction on 13EN, 14EN and 15EN the Bennelong Pond sediment forebay is to be desilted (e.g. to be desilted before each site commences construction, i.e. 3 occasions)
- Post construction of 13EN, 14EN and 15EN the Bennelong Pond sediment forebay is to be desilted (e.g. to be desilted after completion of construction of each site, i.e. three occasions)
- For any construction in this Neighbourhood quarterly inspections and reporting by a BOS certified ecologist is to be undertaken in Bennelong Pond during the entire period of construction including monitoring prior to construction
- For any construction in this Neighbourhood quarterly inspections and reporting of the existing Bennelong Pond WSUD assets (Jellyfish GPT and bioretention swales) is to be undertaken by a suitable qualified and practicing WSUD engineer during construction
- Implement Sydney Olympic Park's Environmental Procedure as outlined in the Attachment 2, Section 2.1 'Works in or near habitats' of the DRAFT BMP 2025 (Refer to Appendix B)
- Prepare a building shade analysis for multistorey buildings to ensure that shading of Badu Mangroves does not impact mangrove forest density and *Zannichellia* survival
- Prepare an obtrusive light assessment for proposed buildings, structures or paths to be lit to ensure dark areas are maintained as per the Dark Areas Map (Figure 26)
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise is not to exceed baseline levels
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Construction and operation of new buildings, structures or paths to be lit in the Eastern

Neighbourhood must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) including but not limited to:

- preventing the use of decorative lighting on new buildings or structures
  - preventing the use of upward facing lighting or lighting facing The Brickpit, Badu Mangroves and Bennelong Pond
  - utilising fully shielded luminaires
  - utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq 3000\text{K}$ )
  - utilising timed lighting control systems to maintain 8 hours of darkness
  - establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)
- For prolonged nighttime construction works (works which occur for more than 2 hours a night and for more than 1 week) a lighting plan and obtrusive lighting assessment is to be developed and reviewed by an ecologist for potential impacts and impacts are to be minimised to acceptable levels
- Nighttime construction works are limited to a curfew of 10 pm to ensure 8 hours of natural darkness

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

#### 5.1.5 NEWINGTON ARMORY

The Master Plan 2050 proposes a number of modifications to the existing site use at the Newington Armory site. These changes are summarised in section 4.2.5.

The Newington Armory site is adjacent to the Newington Nature Reserve. Potential impacts due to development in the area adjacent to the wetlands includes possible impacts to:

- GGBF habitat
- Swamp Oak Floodplain Forest (EEC)
- Sydney Turpentine Ironbark Forest (CEEC)
- Coastal Saltmarsh (EEC)
- Mangrove forest
- Microbats
- White-bellied Sea Eagle (Vulnerable in NSW)
- Migratory shorebirds
- Dark areas

The following implementation measures have been identified to either "avoid" or "minimise" impacts to biodiversity close to the site.

#### Avoid

- Works located at the Newington Armory site are to ensure that no-go zones are established for the following area/s:
  - Newington Nature Reserve boundary (as delineated in the Newington POM)
    - Including 50 m buffer from boundary of Newington Nature Reserve
  - Narawang Wetlands
  - Swamp Oak Floodplain Forest extents (refer to Figure 28)
  - Sydney Turpentine Ironbark Forest extents (refer to Figure 28)
  - Coastal Saltmarsh (refer to Figure 28)
- Avoid light spill to dark areas as per the Dark Areas Map (Figure 21) by

- preventing the use of decorative lighting on new buildings or structures
- preventing the use of upward facing lighting or lighting facing Newington Nature Reserve or 50 m buffer zone
- utilising fully shielded luminaires
- utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq 3000\text{K}$ )
- utilising timed lighting control systems to maintain 8 hours of darkness
- establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)
- Maintain restricted public access to the woodland-wetland corridor between Newington Nature Reserve and the Armory precinct
- Divert all construction runoff and runoff from new impervious surfaces away from adjacent Newington Nature Reserve
- Avoid construction work at night in order to maintain dark areas as per the Dark Areas Map (Appendix A – Map 21)
- Avoid lighting to paths along Newington Nature Reserve Boundary and 50 m buffer zone
  - If proposed, the River Walk footpath could utilise a timed lighting control system to maintain a minimum of 8 hours of natural darkness for ecological processes that occur at night
- Any permanent or temporary camping facilities are to be located outside of the 50m buffer to the Newington Nature Reserve.
- Any permanent or temporary camping facilities are to have a mandatory fire ban to avoid and this is to be clearly communicated to campers through signage or as part of a information fact sheet or similar provided to all campers on arrival/booking

### Minimise

The following measures are to be implemented at various stages of actioning the Master Plan 2050 in order to minimise impacts of development at the Newington Armory site:

- Works located within 100 m of Newington Nature Reserve and scheduled between August and April are to assess potential impacts to nesting migratory shorebirds and nesting waterbirds
  - are to be reviewed by a suitably qualified ecologist
  - are to include specific mitigation measures are to be provided by a suitably qualified ecologist
- Works located within 100 m of Newington Nature Reserve and scheduled between June and January are to assess potential impacts to nesting White-bellied Sea Eagles
  - Specific mitigation measures are to be provided by a suitably qualified ecologist and are to be implemented for the duration of construction
- Avoid scheduling works between July and December to minimise disturbance during White-bellied Sea Eagle nesting period and any proposed works during nesting periods and works located within 100m of the Newington Nature Reserve
  - are to be reviewed by a suitably qualified ecologist
  - are to include specific mitigation measures are to be provided by a suitably qualified ecologist
- Minimise impacts of proposed First Nations area within 50 m buffer by
  - using timed lighting controls in this area to ensure 8 hours of darkness is provided to maintain ecological processes that occur at night
  - scheduled ceremonies and other events through daytime hours only to avoid lighting and noise impacts
  - establish baseline daytime noise levels and ensure daytime ceremonies or events do not

exceed baseline

- Protect coastal saltmarsh and mangrove forest from poor water quality due to construction by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy', as well as:
  - o Inspecting (and rectifying) sediment and erosion control devices weekly or after >5mm rainfall
- Provide ecological induction training and supervision where necessary for staff and contractors working close to Coastal Saltmarsh
- Provide ecological induction training for staff and contractors working near migratory shorebird habitat
- Prevent the spread of weeds to nearby TECs in accordance with Sydney Olympic Park's Invasive Environmental Weeds Procedure
- Implement Sydney Olympic Park's Environmental Procedure as outlined in the 'Attachment 2, Section 2.1 Works in or near habitats' of the DRAFT BMP 2025 (Refer to Appendix B) for works in all areas in Newington Nature
- Construction and operation of buildings, structures or paths to be lit in Newington Armory site must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) including but not limited to:
  - o preventing the use of decorative lighting on new buildings or structures
  - o preventing the use of upward facing lighting or lighting facing Newington Nature Reserve or 50 m buffer zone
  - o utilising fully shielded luminaires
  - o utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq 3000\text{K}$ )
  - o utilising timed lighting control systems to maintain 8 hours of darkness
  - o establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)
- Any future lighting to the River Walk is to utilise fully shielded, directional luminaires on a timed lighting control system to ensure at least 8 hours of full darkness is maintained for ecological processes that occur at night in Newington Nature Reserve
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise not to exceed baseline levels
- Any removal or pruning of mangroves (or other marine vegetation) required as part of any works to come out of the master plan would require a Part 7 Fisheries Management Act permit, unless removal or pruning is covered by the SOPA licence
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- If vegetation removal is to occur within a Biodiversity Values mapped area (Figure 6) then engage a suitably qualified ecologist to apply the BAM and prepare a BDAR to determine impacts of land clearing
- Any permanent or temporary camping facilities are to have a camping management guideline which outlines key measures to minimise impacts on Newington Nature Reserve and are to include an measures which address mitigate potential impacts from noise, light, rubbish, arson and wood collection. The camping management guideline should provide clear guidance on noise restrictions including defined quiet hours and defined dark sky/lights out periods

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

### 5.1.6 WOO-LA-RA PRECINCT

The Master Plan 2050 proposes a number of modifications to the existing site use at the Woo-la-ra Precinct. These changes are summarised in section 4.2.6 and Figure 29.

The Woo-la-ra Precinct is located adjacent to the Newington Nature Reserve as well as being zoned as C3 Environmental Management. Potential impacts due to development in the Woo-la-ra Precinct includes possible impacts to:

- GGBF Habitat (100% of Woo-la-ra Precinct)
- Threatened ecological communities
  - o Sydney Turpentine Ironbark Forest (CEEC)
  - o Coastal Saltmarsh (EEC)
- Mangrove forest
- Dark areas

As such, a number of implementation measures have been identified to “avoid” or “minimise” potential impacts to biodiversity at the various stages of development as follows:

#### Avoid

- Works located within the Woo-la-ra Precinct are to ensure that no-go zones are established for the following area/s:
  - o Newington Nature Reserve boundary (as delineated in the Newington POM)
    - Including 50 m buffer from boundary of Newington Nature Reserve
  - o Sydney Turpentine Ironbark Forest extents (refer to Figure 31)
  - o Coastal Saltmarsh (refer to Figure 31)
- Avoid any loss of GGBF habitat
- Divert all construction runoff and runoff from new impervious surfaces away from adjacent Newington Nature Reserve
- Avoid construction work at night in order to maintain dark areas as per the Dark Areas Map (Appendix A – Map 21)
- Avoid construction work at night in order to maintain existing nighttime noise levels for wildlife in Newington Nature Reserve

#### Minimise

The following measures are to be implemented at various stages of actioning the Master Plan in order to minimise impacts of development within the Woo-la-ra Precinct:

- Works located within 100 m of Newington Nature Reserve and scheduled between August and April are to assess potential impacts to nesting migratory shorebirds and nesting waterbirds,
  - o Specific mitigation measures are to be provided by a suitably qualified ecologist
- Works located within 100 m of Newington Nature Reserve and scheduled between June and January are to assess potential impacts to nesting White-bellied Sea Eagles
  - o Specific mitigation measures are to be provided by a suitably qualified ecologist and are to be implemented for the duration of construction
- Implement Sydney Olympic Park's Environmental Procedure as outlined in the 'Attachment 2, Section 2.1 Works in or near habitats' of the DRAFT BMP 2025 (Appendix B) for works in all areas in Woo-la-ra Precinct (mapped as GGBF habitat)
- Frog habitat clearance is to be undertaken by a suitably qualified ecologist or fauna handler prior to commencing any construction works in the precinct, as per 'Attachment 2, Section 2.2 frog habitat clearance' of the DRAFT BMP 2025 (Appendix B)
- Temporary frog fencing is to be installed around any work sites in the Woo-la-ra Precinct as per 'Attachment 2, Section 2.3 temporary frog fencing' of the DRAFT BMP 2025 (Appendix B)

- Protect coastal saltmarsh and mangrove forest from poor water quality due to construction by implementing sediment control measures around worksites in accordance with Sydney Olympic Park's 'Stormwater Management & Water Sensitive Urban Design Policy', as well as:
  - o Diverting all construction flows away from Newington Nature Reserve
  - o Inspecting (and rectifying) sediment and erosion controls weekly or after >5mm rainfall
- Prevent the spread of weeds to nearby TECs in accordance with Sydney Olympic Park's Invasive Environmental Weeds Procedure
- Provide ecological induction training and supervision where necessary for staff and contractors working within GGBF habitat
- Provide ecological induction training for staff and contractors working near migratory shorebird habitat
- Developer to prepare a noise assessment to establish baseline conditions. Construction noise is not to exceed baseline levels
- Any removal or pruning of mangroves (or other marine vegetation) required as part of any works to come out of the master plan would require a Part 7 Fisheries Management Act permit
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Construction and operation of new buildings, structures or paths to be lit in the Woo-la-ra Precinct must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) including but not limited to:
  - o preventing the use of decorative lighting on new buildings or structures
  - o preventing the use of upward facing lighting or lighting facing Newington Nature Reserve or 50 m buffer zone
  - o utilising fully shielded luminaires
  - o utilising LEDs with appropriate colour corrected temperatures for wildlife (nom.  $\leq$  3000K)
  - o utilising timed lighting control systems to maintain 8 hours of darkness
  - o establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)
- If vegetation removal is to occur within a Biodiversity Values mapped area (Figure 6) then engage a suitably qualified ecologist to apply the BAM and prepare a BDAR to determine impacts of land clearing

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

#### 5.1.7 RECREATION – GENERAL

As Sydney Olympic Park's recreation areas and active recreation paths experiences increased public use as a result of the Master Plan 2050, there are a number of potential impacts to biodiversity to consider. Impacts due to increased passive and active recreation in the Parklands have been identified above in section 4.2.7.

This section identifies potential measures to be implemented at various stages of The Master Plan 2050 that either "avoid" or "minimise" impacts to biodiversity arising due to increased recreation across the Parklands.

##### Avoid

The following measures are to be implemented at various stages of actioning the Master Plan 2050 in order to minimise impacts of increased passive and active recreation:

- Implement strict signage to prevent public access into (excluding access to existing formal paths)
  - o Newington Nature Reserve (wetland and forest)
  - o Badu Mangroves
  - o Narawang Wetlands
  - o Nuri Wetland
  - o Waterbird Refuge (mangroves and saltmarsh)
  - o The Brickpit
  - o The Northern Water Feature
  - o Haslams Creek mangroves and saltmarsh
  - o Bennelong Pond
- Implement educational signage around habitat areas and residential areas to prevent the spread of weeds
- Implement educational signage around habitat areas and residential areas to prevent access from domestic animals (i.e. cats and dogs) into habitat areas
- Continue to prevent access to paths within habitat areas at night

Minimise

The following measures are to be implemented at various stages of actioning the Master Plan 2050 in order to minimise impacts of increased passive and active recreation:

- Conduct a fencing audit to determine if there are locations around habitat where fencing could be improved or repaired
- Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage. Report is to provide recommendations on future lighting operation.
- Installation and operation of lighting to new or existing paths adjacent to mapped Dark Areas (SOPA Map 21) must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) including but not limited to:
  - o preventing the use of decorative lighting on new buildings or structures
  - o preventing the use of upward facing lighting or lighting facing Newington Nature Reserve or 50 m buffer zone
  - o utilising fully shielded luminaires
  - o utilising LEDs with appropriate colour corrected temperature for wildlife (nom. ≤ 3000K)
  - o utilising timed lighting control systems to maintain 8 hours of darkness
  - o establishing lighting in accordance with any other relevant guidelines as per National Light Pollution Guidelines for Wildlife (DCCEEW, 2023)

All the aforementioned measures are to be inspected by an independent and suitably qualified ecologist prior to commencing any work.

## 5.2 CONTROLS

The following controls for the Master Plan 2050 have been recommended to further mitigate impacts to biodiversity in Sydney Olympic Park.

This section proposes possible locations for controls to be included within the Master Plan 2050.

Master Plan 2050 section	Recommended control
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Section 3.5.4	New buildings adjacent to conservation areas (Figure 5.3.2) must not be lit with external decorative lighting to prevent light spill into conservation areas.
Section 3.5.4	Developer to prepare an obtrusive light assessment for proposed buildings, structures or paths to be lit to ensure dark areas are maintained as per the 'Dark Areas' map (SOPA Map 21).
Section 3.5.4	Works adjacent to or within conservation areas (Figure 5.3.2).
Section 3.5.2	Lighting of any proposed structures or paths within or adjacent conservations areas (Figure 3.5.2) must comply with National Light Pollution Guidelines for Wildlife (DCCEEW, 2023).
Section 3.5.2	New multistorey buildings with the potential to overshadow adjacent conservation areas (Figure 3.5.2) must prepare a Building Shade Analysis to prevent impacts to threatened species habitats. To effectively prevent impacts to threatened species habitats from shading the building shade analysis should be completed as early as possible in the planning process.
Section 3.5.2	New multistorey buildings must be situated a minimum of 100 m from migratory shorebird habitat.
Section 3.5.1	No runoff is to be discharged into The Brickpit at any time.
Section 3.5.2	Further educate Sydney Olympic Park residents to prevent potential increased domestic animal predation upon native fauna. Particularly relevant for residents in Haslams Neighbourhood and Eastern Neighbourhood.
Section 3.5.2	Further educate Sydney Olympic Park residents on threatened species habitats to minimise impacts of increases active and passive recreation throughout the Parklands.
Section 3.5.2	Conduct a fencing audit to determine if there are locations around threatened species habitat where fencing could be improved or repaired.
Section 3.5.2	Any existing lighting in habitat areas / adjacent to dark areas to be audited at 12 months and 24 months post installation by an independent ecological consultant, lighting engineer and active transport specialist to assess lighting operation and path usage.
Section 3.5.2	New development in close proximity to migratory shorebird habitats to consider nesting periods for migratory shorebirds.
Section 3.5.2	Works within close proximity of Newington Nature Reserve to consider White-bellied Sea Eagles nesting period.

## 6 GLOSSARY AND ABBREVIATIONS

<b>Biodiversity</b>	Variety and number of different species living in an ecosystem or a defined geographic area
<b>BC Act</b>	Biodiversity Conservation Act 2016
<b>BDAR</b>	Biodiversity Assessment Development Report: a requirement for land clearing in areas mapped as Biodiversity Values. The report determines biodiversity impacts and biodiversity offset credits required to offset the impacts of development.
<b>BMP</b>	Biodiversity Management Plan
<b>BOS</b>	Biodiversity Offsets Scheme: a State Government mechanism that aims to avoid, minimise and offset the impacts of development and certain types of land clearing on biodiversity
<b>Catchment</b>	The area of land draining to a waterway. May also refer to areas served by a wastewater or stormwater system
<b>Conservation</b>	Use, management and protection of resources so they are not degraded, depleted or wasted and are available on a sustainable basis for present and future generations
<b>CRC SEPP</b>	State Environmental Planning Policy (Precincts—Central River City) 2021
<b>dB(A)</b>	A-weighted decibels
<b>Ecologically sustainable development (ESD)</b>	Development that improves the quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends
<b>Ecosystem</b>	A community of organisms, interacting with one another, and the environment in which they live. Processes occurring within an ecosystem are the flow of energy by food chains and food webs and nutrient cycling. An ecosystem may be a pond that is dry for half the year, a lake or even a planet
<b>EEC</b>	Endangered Ecological Community
<b>REF</b>	Review of Environmental Factors
<b>Emission</b>	Anything given off as a result of a process, for example, gases, heat and odours.
<b>EIS</b>	Environmental Impact Statement
<b>EMP</b>	Environmental Management Plan
<b>EMS</b>	Environmental Management System, the framework for the management of environmental issues

<b>Environmental impact</b>	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products and services
<b>Environmental indicators</b>	Physical, chemical or biological features that can be monitored and used to measure changes in the environment
<b>EPA</b>	Environmental Protection Authority
<b>EP&amp;A Act</b>	Environmental Planning and Assessment Act 1979
<b>EP&amp;A Regulation</b>	Environmental Planning and Assessment Regulation 2021
<b>EPBC Act</b>	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
<b>EPL</b>	Environment Protection Licence, issued by the Environment Protection Authority (EPA)
<b>FM Act</b>	Fisheries Management Act 1994
<b>GGBF</b>	Green and Golden Bell Frog
<b>Greenhouse emissions</b>	<b>gas</b> Gases such as carbon dioxide and other forms of emissions to the atmosphere, resulting from the burning of fossil fuels (such as coal, natural gas or oil) and land clearing, which contribute to global warming
<b>Groundwater</b>	Water found below the surface, usually in porous rock or soil or in underground aquifers (natural underground formations that contains sufficient saturated, permeable material to yield significant quantities of water)
<b>LGA</b>	Local Government Area
<b>Master Plan</b>	A high-level planning document that sets out long-term planning objectives, vision and goals for a specific area including land use, infrastructure and community facilities
<b>Newington PoM</b>	Newington Nature Reserve Plan of Management
<b>Nutrients</b>	Substances required for growth by plants and other organisms. Major plant nutrients are phosphorus and nitrogen
<b>NPW Act</b>	National Parks and Wildlife Act 1974
<b>NPWS</b>	National Parks and Wildlife Service
<b>NWF</b>	Northern Water Feature
<b>OEH</b>	Office of the Environment and Heritage
<b>Parklands Plan</b>	Plan of Management for the Parklands at Sydney Olympic Park 2010
<b>POEO Act</b>	Protection of the Environment Operations Act
<b>Pollutants</b>	Contaminants in water, soil or air that, when in sufficient quantity, may cause environmental degradation

<b>Pollution</b>	Any harmful or undesirable change in the physical, chemical or biological quality of air, water or soil as a result of the release of chemicals, radioactivity, heat and large amounts of organic matter
<b>Receiving water</b>	A stream, river, pond, lake or ocean that receives stormwater or wastewater discharges
<b>R&amp;H SEPP</b>	State Environmental Planning Policy (Resilience and Hazards) 2021
<b>Runoff</b>	Water that flows across the land surface and does not soak into the ground
<b>Sediment</b>	Soil or other particles that settle to the bottom of lakes, rivers, oceans and other waters
<b>SEPP</b>	State Environmental Planning Policy: a statutory environmental planning instrument under the EP&A Act
<b>Sewage</b>	The wastewater from homes, offices, shops, factories and other premises discharged to the sewer. Approximately 99 per cent of sewage is water
<b>Sewerage system</b>	The network of pipes, pumping stations and treatment plants used to collect, transport, treat and discharge sewage (wastewater)
<b>SIS</b>	Species Impact Statement
<b>SOFF</b>	Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions
<b>SOP</b>	Sydney Olympic Park
<b>SOPA</b>	Sydney Olympic Park Authority
<b>Stakeholder</b>	A stakeholder is any individual or group, which can affect or is affected by an organisation's activities
<b>STIF</b>	Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion
<b>Stormwater system</b>	The system of pipes, canals and other channels used to carry stormwater to bodies of water, such as rivers or oceans. The system does not usually involve any treatment
<b>Stormwater</b>	Rainwater that runs off the land, frequently carrying various forms of pollution such as litter and detritus, animal droppings and dissolved chemicals
<b>Suspended solids</b>	Particles in water that can be removed by sedimentation or filtration
<b>Sustainable development</b>	Activities that can be maintained over the long term while achieving a balance between the environment, the economy and society
<b>TEC</b>	Threatened ecological community: an ecological community listed as vulnerable, endangered or critically endangered under the EPBC Act (Federal) or BC Act (NSW)
<b>WSUD</b>	Water Sensitive Urban Design: incorporates a range of initiatives designed to reduce the impact of urban stormwater

**Waterways**

All streams, creeks, rivers, estuaries, inlets and harbours

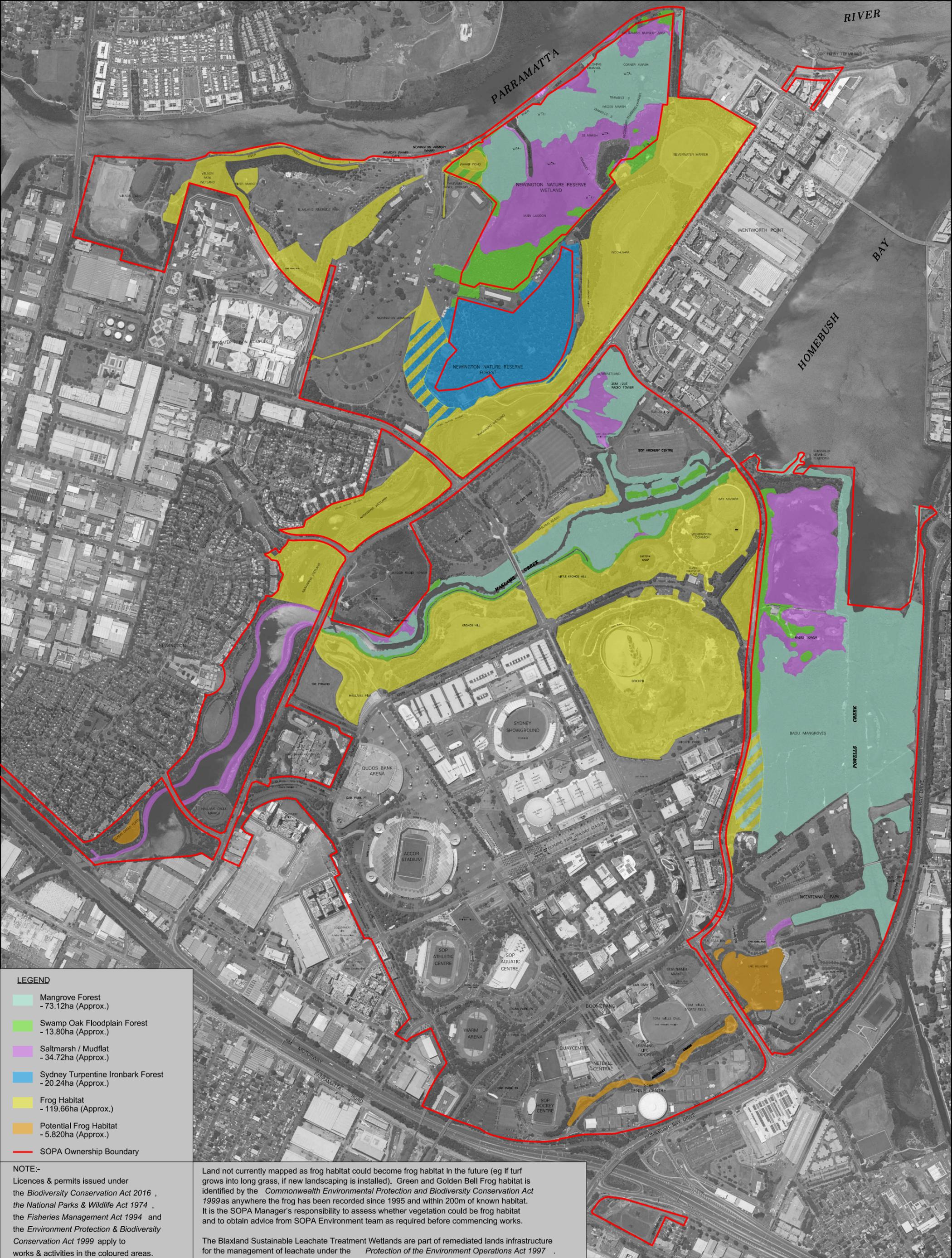
**Wetland**

A wetland is a low-lying area of land often inundated or permanently covered by shallow water. They play a major role in the water cycle by storing and filtering water and replenishing underground water supplies. Wetlands can also be effective in cleaning polluted water by reducing aquatic plant nutrients, suspended solids and oxygen demands

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# APPENDIX A SOPA BIODIVERSITY MAPS

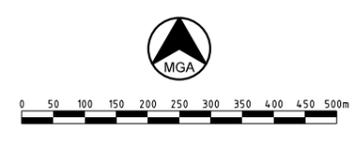


- LEGEND**
- Mangrove Forest  
- 73.12ha (Approx.)
  - Swamp Oak Floodplain Forest  
- 13.80ha (Approx.)
  - Saltmarsh / Mudflat  
- 34.72ha (Approx.)
  - Sydney Turpentine Ironbark Forest  
- 20.24ha (Approx.)
  - Frog Habitat  
- 119.66ha (Approx.)
  - Potential Frog Habitat  
- 5.820ha (Approx.)
  - SOPA Ownership Boundary

**NOTE:-**  
Licences & permits issued under the Biodiversity Conservation Act 2016, the National Parks & Wildlife Act 1974, the Fisheries Management Act 1994 and the Environment Protection & Biodiversity Conservation Act 1999 apply to works & activities in the coloured areas.

Land not currently mapped as frog habitat could become frog habitat in the future (eg if turf grows into long grass, if new landscaping is installed). Green and Golden Bell Frog habitat is identified by the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 as anywhere the frog has been recorded since 1995 and within 200m of known habitat. It is the SOPA Manager's responsibility to assess whether vegetation could be frog habitat and to obtain advice from SOPA Environment team as required before commencing works.

The Blaxland Sustainable Leachate Treatment Wetlands are part of remediated lands infrastructure for the management of leachate under the Protection of the Environment Operations Act 1997.



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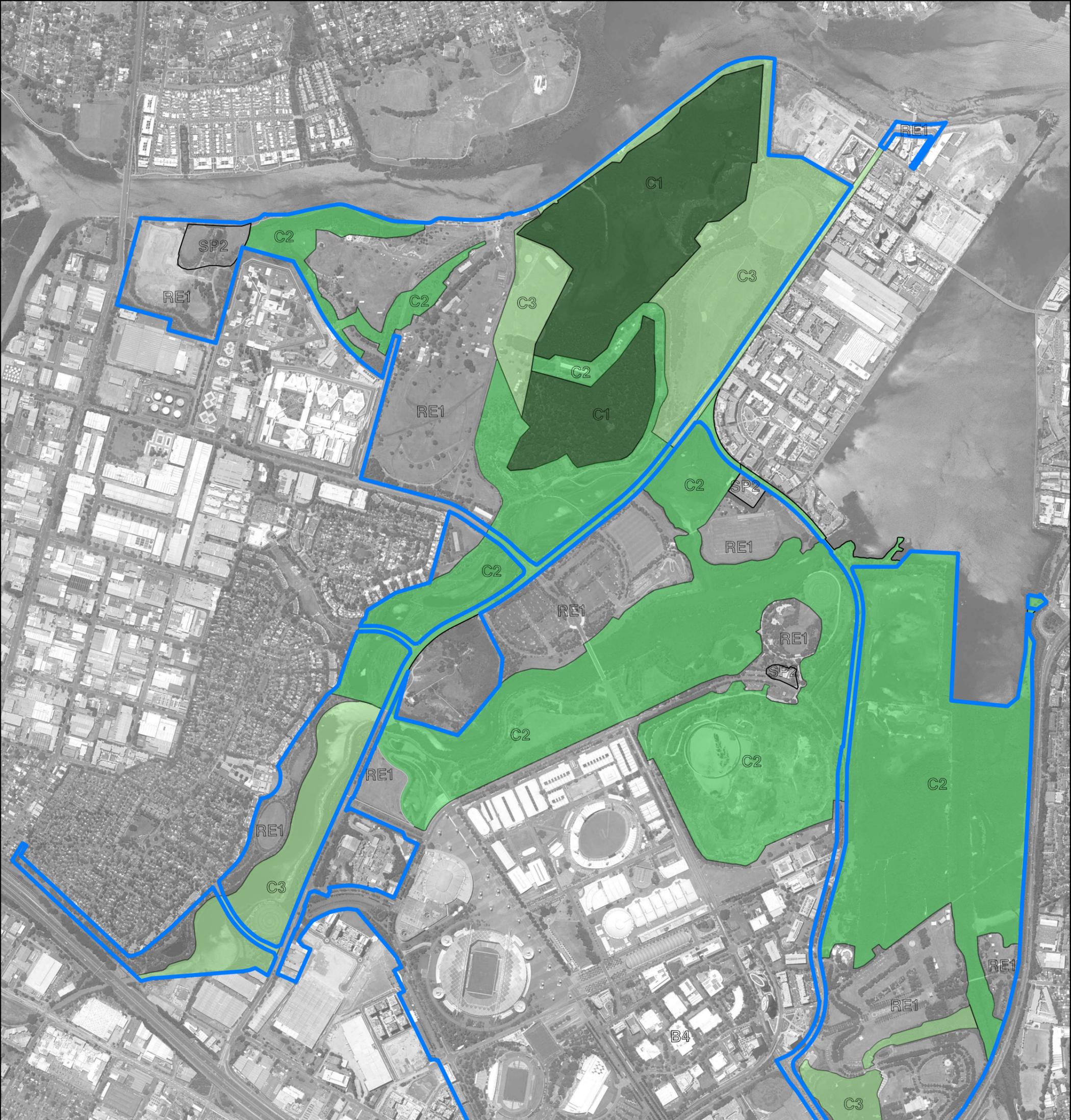
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**SYDNEY OLYMPIC PARK  
THREATENED SPECIES HABITATS  
MAP 1**

Date of Photography: 16-01-2021

**SydneyOlympicPark**

DRG. NO. : 001-G-G-0220 REV. Z  
SCALE: AS PER SCALE BAR  
PLOT DATE: 26/05/2022



**LEGEND**

SOPA Ownership Boundary

**Zone**

- B1 - NEIGHBOURHOOD CENTRE
- B4 - MIXED USE
- C1 - NATIONAL PARKS & NATURE RESERVES
- C2 - ENVIRONMENTAL CONSERVATION
- C3 - ENVIRONMENTAL MANAGEMENT
- SP2 - INFRASTRUCTURE
- RE1 - PUBLIC RECREATION (123.56 ha)

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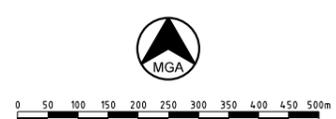
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**SYDNEY OLYMPIC PARK**  
**LANDS ZONED FOR CONSERVATION**  
 Date of Photography: 16-01-2021

**SydneyOlympicPark**

DRG. NO. : 001-G-G-0490 REV. B  
 SCALE : AS PER SCALE BAR





- LEGEND**
- Frog Habitat  
- 119.96ha (Approx.)
  - Potential Frog Habitat  
- 5.810ha (Approx.)
  - Parklands Precinct Boundary

Land not currently mapped as frog habitat could become frog habitat in the future (eg if turf grows into long grass, if new landscaping is installed). Green and Golden Bell Frog habitat is identified by the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* as anywhere the frog has been recorded since 1995 and within 200m of known habitat. It is the SOPA Manager's responsibility to assess whether vegetation could be frog habitat and to obtain advice from SOPA Environment team as required before commencing works.

The Blaxland Sustainable Leachate Treatment Wetlands are part of remediated lands infrastructure for the management of leachate under the *Protection of the Environment Operations Act 1997*

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- LEGEND**
- Frog Habitat
  - Frog Pond
  - Frog Fence
  - Frog Underpass / Culvert
  - Parkland Zone Boundary



**LEGEND**

- Frog Habitat
- Frog Pond
- Frog Fence
- Frog Underpass / Culvert

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NOTES

**SYDNEY OLYMPIC PARK**

KRONOS HILL, WENTWORTH COMMON and HASLAM'S REACH  
GREEN and GOLDEN BELL FROG HABITATS  
MAP 6

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**SydneyOlympicPark**

DRG. NO. : 001-G-G-0101 REV. P  
SCALE : AS PER SCALE BAR  
PLOT DATE: 17/05/2022

**LEGEND**

- Frog Habitat
- Frog Pond
- Frog Fence
- Frog Underpass / Culvert



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**NOTES**



**SYDNEY OLYMPIC PARK**  
**NARAWANG WETLAND**  
**GREEN and GOLDEN BELL FROG HABITATS**  
**MAP 7**

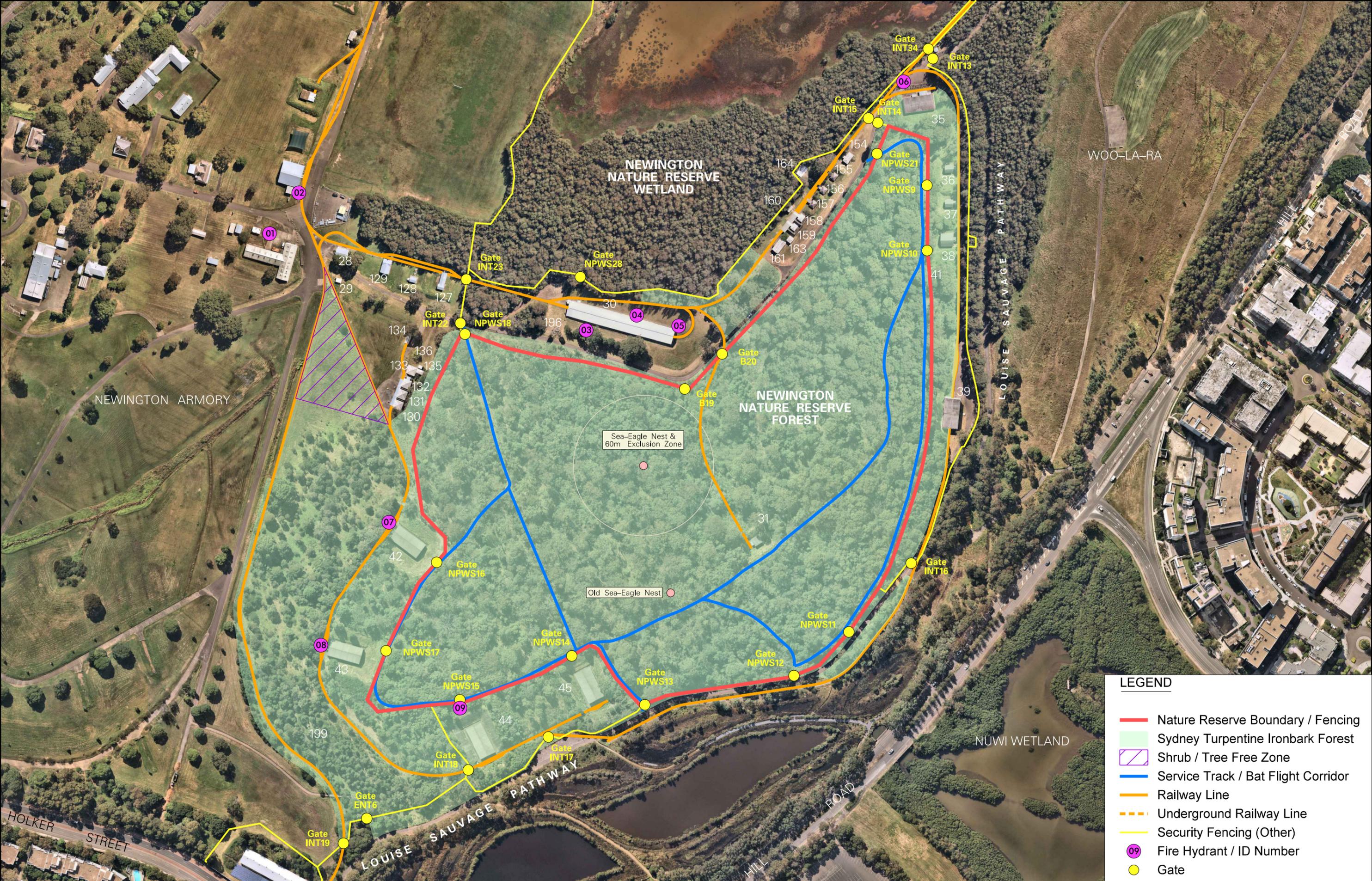
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**SydneyOlympicPark**

DRG. NO. : 001-G-G-0102 REV. P  
 SCALE : AS PER SCALE BAR

PLOT DATE: 17/05/2022



**LEGEND**

- Nature Reserve Boundary / Fencing
- Sydney Turpentine Ironbark Forest
- Shrub / Tree Free Zone
- Service Track / Bat Flight Corridor
- Railway Line
- Underground Railway Line
- Security Fencing (Other)
- Fire Hydrant / ID Number
- Gate

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NOTES

**SYDNEY OLYMPIC PARK**  
**SYDNEY TURPENTINE IRONBARK FOREST**  
**NEWINGTON NATURE RESERVE and NEWINGTON ARMORY**  
**MAP 10**

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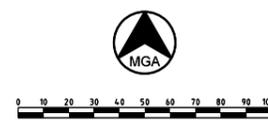
SydneyOlympicPark

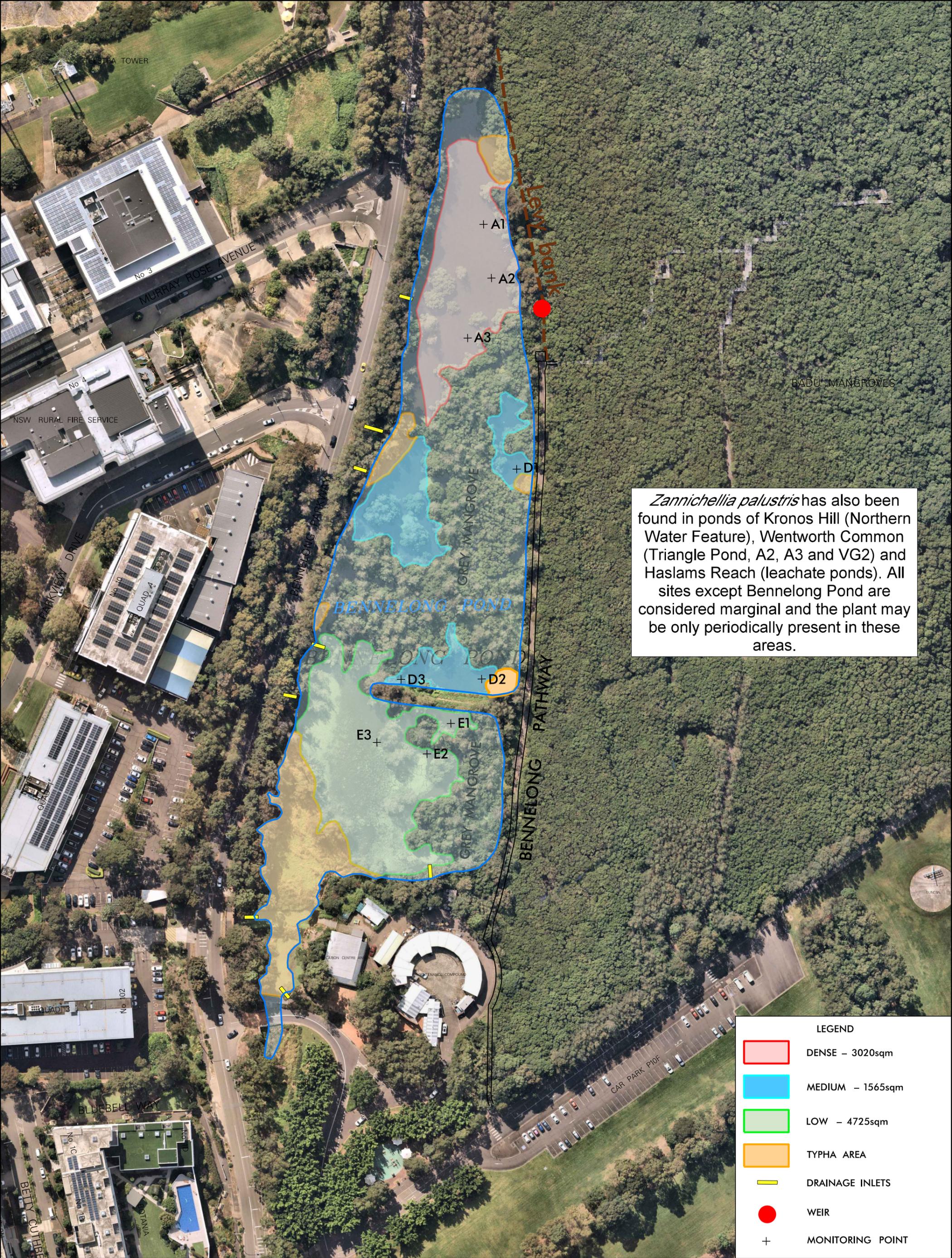
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DRG. NO. : 004-P-P-0016 REV. S  
 SCALE : AS PER SCALE BAR

PLOT DATE: 17/05/2022





*Zannichellia palustris* has also been found in ponds of Kronos Hill (Northern Water Feature), Wentworth Common (Triangle Pond, A2, A3 and VG2) and Haslams Reach (leachate ponds). All sites except Bennelong Pond are considered marginal and the plant may be only periodically present in these areas.

LEGEND	
	DENSE - 3020sqm
	MEDIUM - 1565sqm
	LOW - 4725sqm
	TYPHA AREA
	DRAINAGE INLETS
	WEIR
	MONITORING POINT

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SYDNEY OLYMPIC PARK  
 ZANNICHELLIA PALUSTRIS DISTRIBUTION  
 BENNELONG POND  
 MAP 11

SydneyOlympicPark

DRG. NO. : 073-G-G-0022 REV. N  
 SCALE : AS PER SCALE BAR  
 PLOT DATE : 17/05/2022



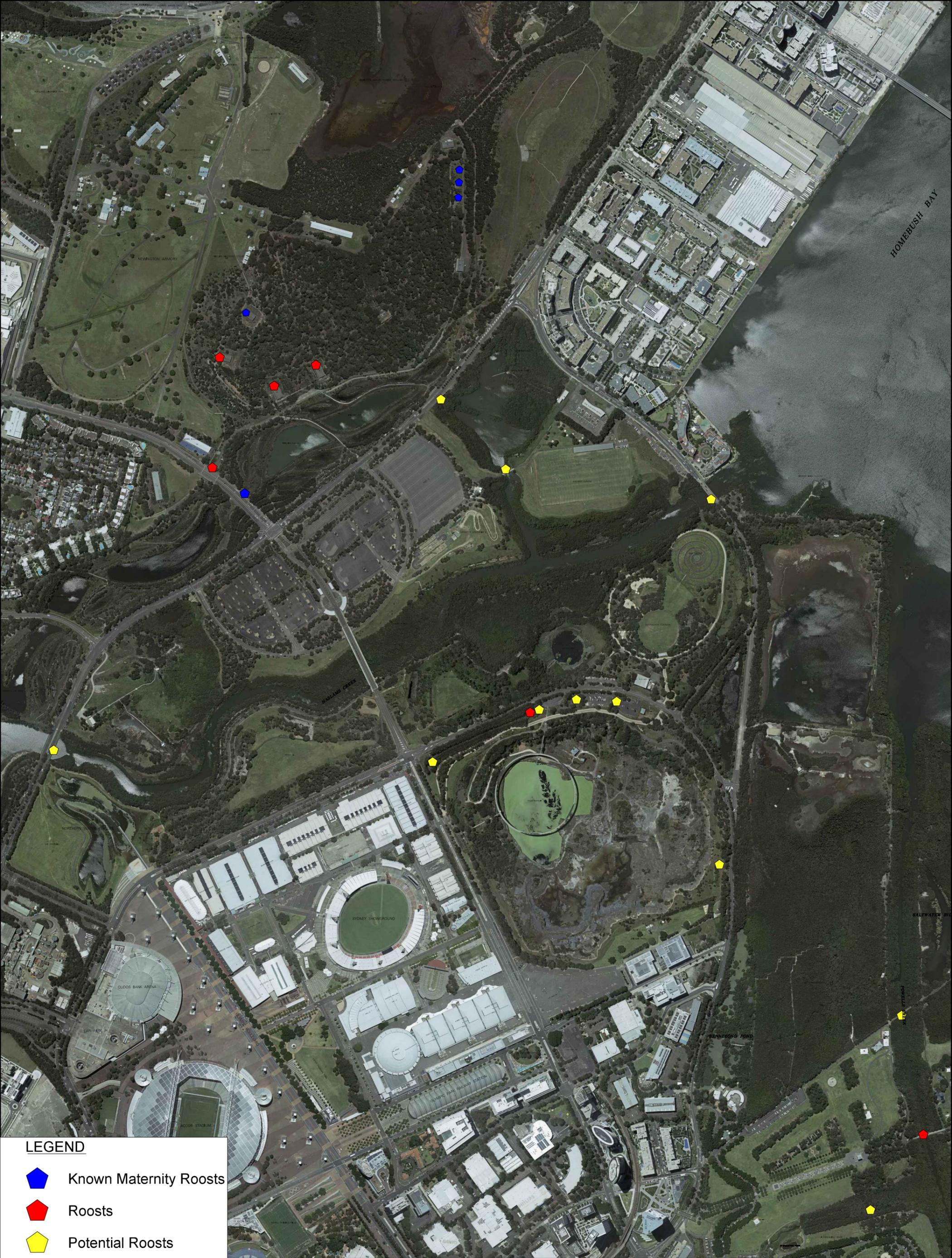


The purpose of this drawing is to identify 'saltmarsh/mudflat conservation zones', where removal of mangrove seedlings for the purpose of saltmarsh and mudflat conservation is permitted.

Care must be taken when using this drawing for other purposes. The drawing does not accurately show all locations of mangrove and saltmarsh communities within Sydney Olympic Park, for example, areas mapped as 'mangrove conservation zone' include large tracts of saltmarsh and open water.

**LEGEND**

- Saltmarsh / Mudflat / Tidal Wetland Conservation Zone - 38.51ha (Approx.)
- Mangrove Conservation Zone - 73.13ha (Approx.)
- Parklands Precinct Boundary



**LEGEND**

-  Known Maternity Roosts
-  Roosts
-  Potential Roosts

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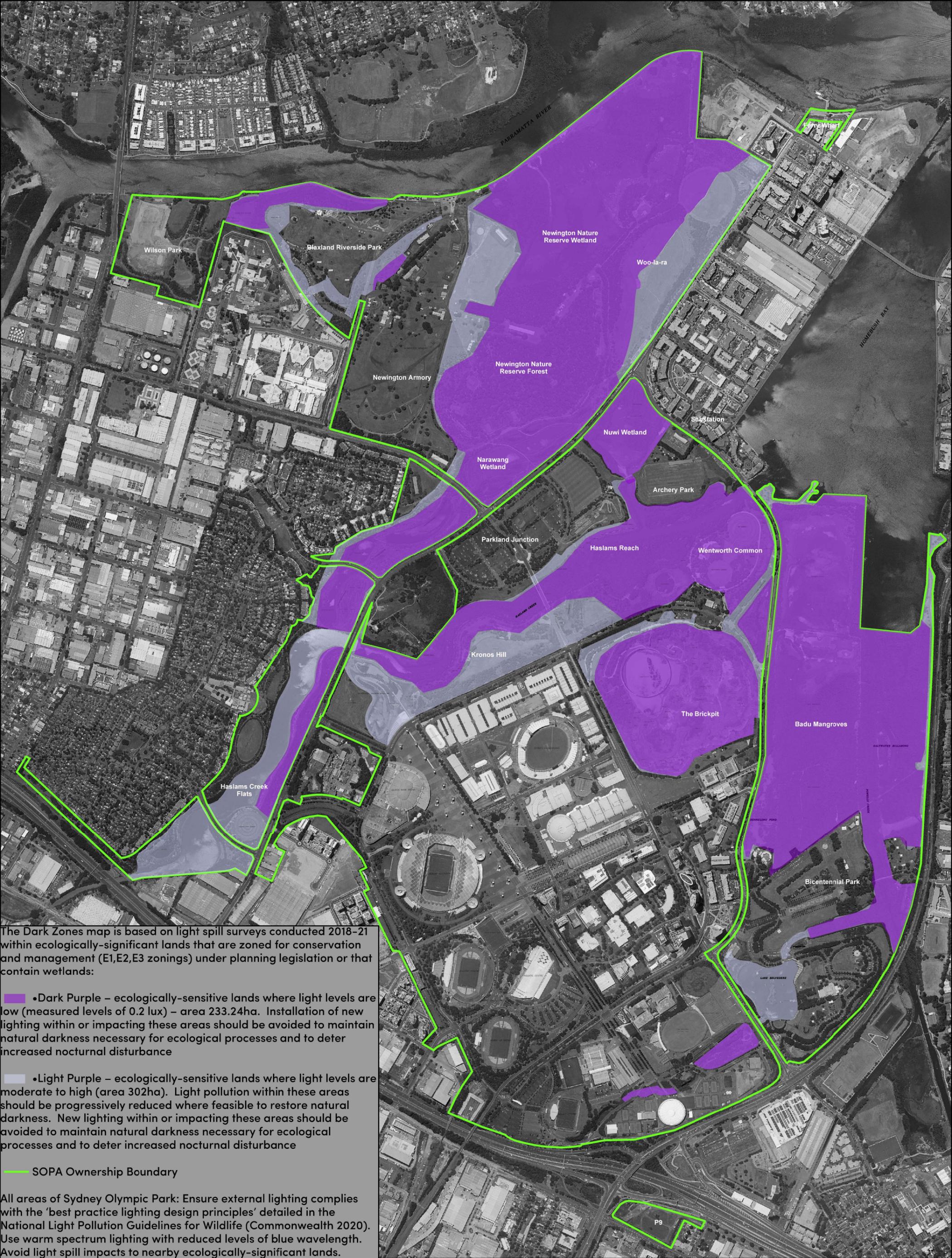
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**SYDNEY OLYMPIC PARK**  
**MAP 20**  
**MICROBAT ROOSTS AND MATERNITY ROOSTS**

**SydneyOlympicPark** 

DRG. NO. : 001-G-G-0499 REV. B  
 SCALE : AS PER SCALE BAR

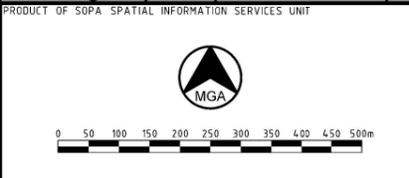
PLOT DATE 4/05/2022



The Dark Zones map is based on light spill surveys conducted 2018-21 within ecologically-significant lands that are zoned for conservation and management (E1,E2,E3 zonings) under planning legislation or that contain wetlands:

- Dark Purple – ecologically-sensitive lands where light levels are low (measured levels of 0.2 lux) – area 233.24ha. Installation of new lighting within or impacting these areas should be avoided to maintain natural darkness necessary for ecological processes and to deter increased nocturnal disturbance
- Light Purple – ecologically-sensitive lands where light levels are moderate to high (area 302ha). Light pollution within these areas should be progressively reduced where feasible to restore natural darkness. New lighting within or impacting these areas should be avoided to maintain natural darkness necessary for ecological processes and to deter increased nocturnal disturbance
- SOPA Ownership Boundary

All areas of Sydney Olympic Park: Ensure external lighting complies with the 'best practice lighting design principles' detailed in the National Light Pollution Guidelines for Wildlife (Commonwealth 2020). Use warm spectrum lighting with reduced levels of blue wavelength. Avoid light spill impacts to nearby ecologically-significant lands.



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# SYDNEY OLYMPIC PARK

## DARK AREAS

**SydneyOlympicPark**

DRG. NO. : 001-G-G-0458 REV. F  
 SCALE : AS PER SCALE BAR  
PLOT DATE: 31/08/2021

# APPENDIX B SOPA ENVIRONMENTAL PROCEDURES

## Environmental Procedures: Biodiversity

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April 2025

### 1. Introduction

Sydney Olympic Park Authority is committed to ensuring nature at the Park is protected, nurtured, valued and enhanced, and implements a comprehensive conservation management program in pursuit of this goal.

These Environmental Procedures apply to conduct of common park operations that have potential to harm native flora and fauna at Sydney Olympic Park. Regulatory Licences and Permits issued to SOPA require these procedures to be followed when undertaking activities within the Park's habitats. Applying these procedures will avoid or minimise risk of harm to flora and fauna and ensure compliance with regulatory requirements including:

- *NSW Biodiversity Conservation Act 2016*
- *NSW Fisheries Management Act 1994*
- *NSW National Parks & Wildlife Act 1974*
- *Commonwealth Environment Protection & Biodiversity Conservation Act 1999*
- Various development consents issued to SOPA under the NSW Environmental Planning & Assessment Act 1979 that impose conditions on activities within the Park's habitats

This procedure is focussed on nature conservation. Works must also comply with all other environmental and planning laws, and with contract requirements.

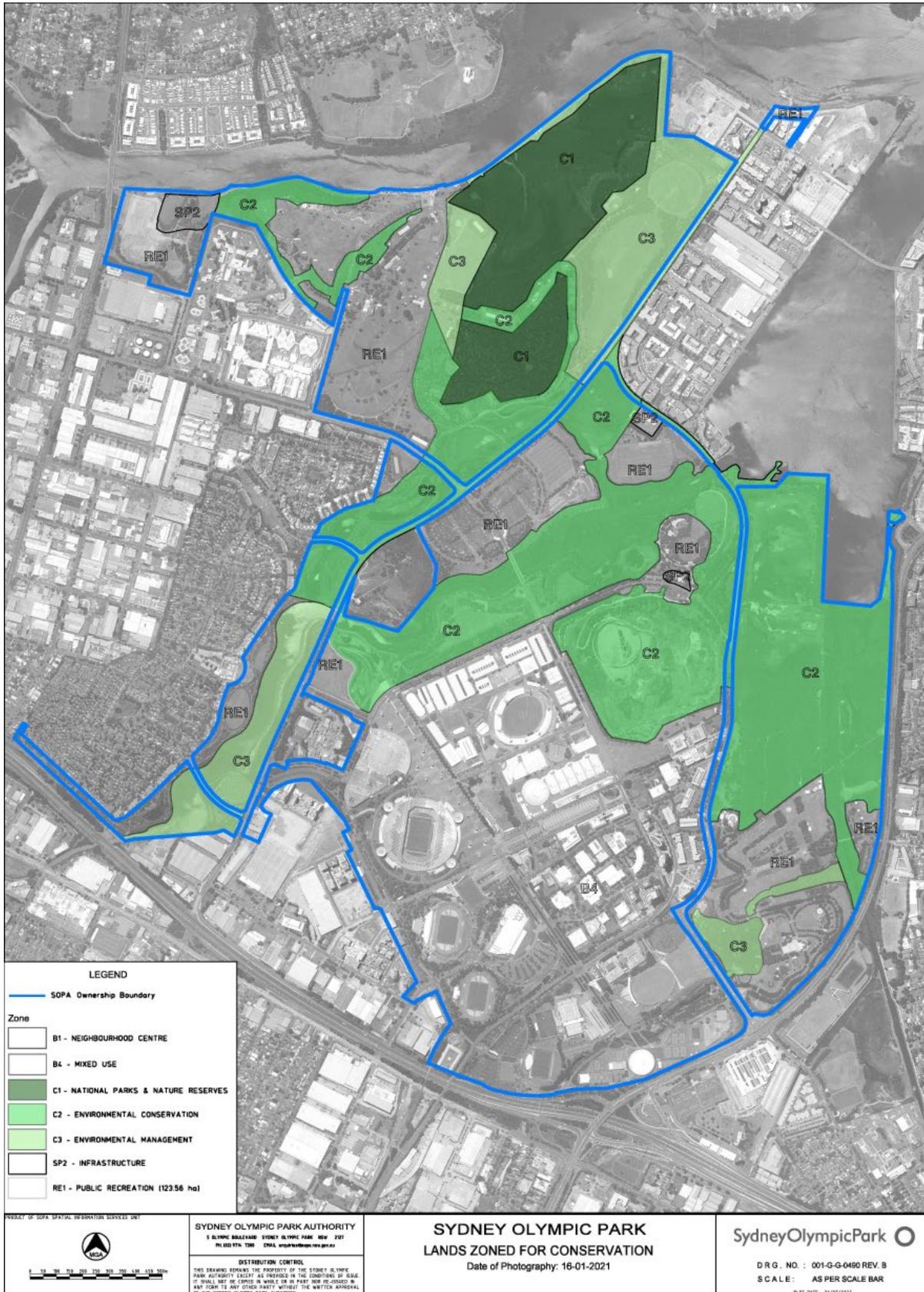
### 2. To whom and where this procedure applies

The Biodiversity Management Plan applies to the whole of Sydney Olympic Park, as shown in Figure 1.

- Lands that are specifically zoned and managed for biodiversity values are coloured green on this map. Additional areas containing habitat areas include: all wetlands, waterways and adjacent riparian lands (including Boundary Creek, Armory Creek, and Wilson Park bioremediation wetlands). Impact of activities conducted on unshaded land that may affect adjacent habitats must also be considered.
- Activities that may affect habitats include: landscape maintenance, maintenance and upgrade of assets and infrastructure, habitat management, capital works, security operations, pest management, environmental monitoring and research, visitor programs, events, and similar.
- The Plan applies to all employees, consultants and contractors of the Sydney Olympic Park Authority, and to volunteers taking part in Park programs. Biodiversity management is an integral responsibility of all SOPA staff whose work may affect wildlife or habitats, including maintenance contract managers, capital works project managers, events and program deliverers, licensee managers, and park managers. Each staff member is responsible for pro-actively addressing biodiversity management requirements across the scope of their activities.

# Environmental Procedures: Biodiversity

April 2025



## Environmental Procedures: Biodiversity

---

April 2025

### 3. Procedure

The Environmental Procedures are set out on the following pages and are:

1. General requirements (applicable to all activities)
2. Works in or near habitats
  - 2.1. Works procedure
  - 2.2. Site preparation – frog habitat clearance
  - 2.3. Site preparation – temporary frog fencing
  - 2.4. Protecting microbat roosts – buildings, bridges and culverts
3. Asset and infrastructure – maintenance and operation
  - 3.1. Pathway maintenance
  - 3.2. Stormwater system maintenance
  - 3.3. Water level management of Eastern Pond, Northern Water Feature and Brickpit Reservoir
  - 3.4. WRAMS operations
  - 3.5. Leachate system management
  - 3.6. Litter collection from creeks and wetlands (contractors)
  - 3.7. Litter collection by volunteers
  - 3.8. Horse trail operation
4. Soft landscape management
  - 4.1. Turf maintenance (mowing and spraying)
  - 4.2. Sydney Turpentine Ironbark Forest – soft landscape maintenance
  - 4.3. Mangrove tree works – pruning or removal
  - 4.4. Estuarine wetlands – soft landscape maintenance
  - 4.5. Frog habitat – soft landscape maintenance
  - 4.6. Frog pond node management
  - 4.7. Wildlife release by wildlife carers

### 4. Failure to comply with this procedure

Failing to implement this Environmental Procedure may result in long or short term impacts to native plants and wildlife communities, including impacts that may not be apparent to the casual observer.

Compliance with the Environmental Procedure is a condition of regulatory licences/ permits/ consents issued to SOPA under environmental legislation; persons not applying these procedures could be prosecuted - it is illegal to harm or damage wildlife, threatened

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species or ecological communities, habitat of a threatened species, or mangrove trees - except in accordance with Licence / Authority conditions, or Planning approvals.

### 5. Related documents

Documents that should be read in conjunctions with this procedure:

- Sydney Olympic Park Biodiversity Management Plan
- Licence issued to SOPA under *NSW Biodiversity Conservation Act 2016*
- Permit issued to SOPA under *NSW Fisheries Management Act 1994*

### 6. Roles & Responsibilities

Role	Responsibility
SOPA staff (contract managers, event managers, project managers)	<ul style="list-style-type: none"> <li> <input checked="" type="checkbox"/> Plan works, developments, programs and events in a manner that is consistent with relevant environmental procedures and regulatory licences, and accounts for any seasonal restrictions                               Assess potential ecological impacts and locational requirements BEFORE finalising tender specifications or work instructions. Be aware that potential impacts and required mitigation measures will vary seasonally, and obtain advice from the Parklands Ecologist where necessary.                               Ensure tender, licence and work specifications adopt the requirements of this Environmental Procedure together with any site-specific or season-specific requirements advised by the Parklands Ecologist.                         </li> <li> <input checked="" type="checkbox"/> Ensure vegetation works are undertaken by qualified bush regenerators, horticulturalists or arborists in accordance with industry best practices.                         </li> <li> <input checked="" type="checkbox"/> Provide copies of applicable Licences and Permits for contractors/licensees to carry on site (as per Licence/Permit conditions).                         </li> <li> <input checked="" type="checkbox"/> Ensure contractor EMPs identify and address the provisions of this Environmental Procedure, as well as other relevant environmental risks.                         </li> <li> <input checked="" type="checkbox"/> Ensure all SOPA staff and contractors/subcontractors complete SOPA Environmental Induction training and restricted area inductions prior to works.                         </li> <li> <input checked="" type="checkbox"/> Oversee compliance by contractors / licensees / staff throughout the activity; monitor and address any non-compliances.                         </li> </ul>
Contractors, volunteers, licensees	<ul style="list-style-type: none"> <li> <input checked="" type="checkbox"/> Comply with environmental conditions of contracts and agreements                         </li> <li> <input checked="" type="checkbox"/> Participate in SOPA Environmental induction training and implement work practices identified in the EMP                         </li> </ul>

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Role	Responsibility
<b>Senior Manager Environment &amp; Ecology</b>	Apply for regulatory Licences and Permits required for SOPA works within threatened species habitats and/areas of protected marine vegetation and address SOPA reporting obligations under those instruments  Provide training to staff and contractors on licence/Permit requirements for working in habitat areas

## 7. Review timeframe

SOPA Urban Renewal & Environment Branch will review this procedure within three years from the date the document is approved, in conjunction with Licensing periods. The document may be reviewed earlier in response to post-implementation feedback, changes to legislation, or as necessary.

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### Procedure metadata

Category	Description
Status	Active
Date of approval	16 September 2024
Approver	Director Urban Renewal & Environment
Group	Property Development and Valuation
Division	Sydney Olympic Park Authority
Policy owner	Senior Manager Environment & Ecology
Branch	Urban Renewal & Environment
Document location	SOPA Intranet
Next review date	
Associated procedure	-
Any additional applicability	-
Superseded document	-
Further information	Kerry.darcovich@sopa.nsw.gov.au
Document Reference	

### Version control

Version Number	Date Issued	Changes
1		<p>The first SOPA Biodiversity Management Plan was prepared in 2008 and superceded previous 'Frog Management Plans' dating from 1999. It has been reviewed and updated every three years in conjunction with licensing periods under the <i>NSW Biodiversity Conservation Act 2016</i>.</p> <p>The 2025 Plan is updated and reformatted in current SOPA style, with negligible change to existing requirements. Biodiversity commitments set out in the 2025 (draft) Environmental Guidelines for Sydney Olympic Park are adopted. Mitigation measures for works in frog habitats are more formalised but with negligible change to requirements. There is a new procedure for management of frog pond nodes installed subsequent to licensing of the previous Plan.</p>

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# 1. General requirements – all activities

## 1.1 Biosecurity

Biosecurity protocols prevent the spread of weeds, pest and diseases into Sydney Olympic Park and between worksites within Sydney Olympic Park.

- Brief all personnel on the specific biosecurity risks relevant to the worksite. Understand any specific hygiene protocols to be applied and be able to recognise relevant weed and pest organisms.
- Arrive clean – before entering Sydney Olympic Park, clean mud and plant material from clothing, tools and equipment including vehicles, lawnmowers, boats, boat trailers, brushcutters, and boots. A designated wash-down area is available at the Place Management Centre. Disinfect as required for disease management.
- Move clean – clean and disinfect clothing, tools and equipment as needed to manage risk when moving between worksites – eg mowing turf containing Chilean Needle Grass, entering wetlands, and working within seeding Coolatai.
- Source new plants from nurseries with good biosecurity practices. Check macrophytes for gambusia and aquatic weed propagules before planting.
- Apply phytophthora biosecurity measures when entering Newington Nature Reserve Forest. Disinfect footwear in accordance with precinct access procedures.
- Apply gambusia and chytrid biosecurity measures when entering the Brickpit. Footwear must be

disinfected in accordance with SOPA Brickpit Access Procedures.

- Apply chytrid control measures when undertaking approved activities that involve handling of frogs. Sydney Olympic Park is considered as one site for the management of chytrid.
- Ensure team members know the Gambusia status of ponds in the work area and access ‘clean’ (gambusia-free) ponds prior to ‘infested’ ponds on any given work day: Do not transplant macrophytes from ‘infested’ to ‘clean’ ponds.

**Gambusia-free:** Brickpit, NWF, Kronos Hill & Wentworth Common ponds, Eastern Pond, Haslams Reach leachate ponds, Blaxland Riverside Park.

**Gambusia-reduced:** nominated Narawang Wetland ponds (as advised by SOPA); Wharf Pond after drought.

**Gambusia-infested:** all other ponds & estuarine waters, Lake Belvedere, Triangle Pond, all other Narawang Wetland ponds, underpasses connected to Triangle Pond, Haslams Creek, Boundary Creek, Powells Creek.

## 1.2 Protect wildlife and their habitats:

- Identify any site-specific requirements to account for any nearby nesting birds, bat roosts, frog habitat, other wildlife or protected vegetation that may be impacted by works

- Minimise trampling of native and weedy vegetation. Off-path, try to walk on mulch or bare ground; vary your route and don’t walk in single file to avoid forming a track. Avoid walking on roof tiles or tin that may be sheltering frogs. Do not drag tools or rubbish bags across vegetation.
- Be alert for bird nests on bare ground and in vegetation – give them a wide berth and don’t try to photograph nests as parents may abandon them if scared away. Don’t interfere with trees containing nest boxes or hollows.
- Do not enter wetlands except where necessary for the activity. Discontinue works if tadpoles are seen to avoid stirring up sediments.
- Do not pick flowers or plants.
- Take care to not damage frog fencing (black shadecloth). Do not climb over frog fencing, lean tools or bollards on it, attach signs or power cords, or pile materials against it.
- Be aware that rubbish, materials and greenwaste may be sheltering frogs and lizards. Remove loose rubbish and materials from site daily. Look inside open containers and pipes before bagging them. Lift larger litter carefully without rotating it to avoid crushing of any wildlife sheltering underneath. Leave litter in place if it is sheltering wildlife.
- Do not fly drones without SOPA approval. Drones are prohibited in many areas of the parklands to avoid disturbance to birds and bats.
- Do not bring pets into the Park when working.
- Prevent wildfire – don’t smoke in grassland or bushland. Carry a fire extinguisher during all hot works; hot works are prohibited on days of total fire ban or extreme fire danger.
- Remove all personal litter eg cigarette butts, fruit peel, chewing gum.
- Do not use detergents or other chemicals to clean the Ringwalk or boardwalks to prevent pollution of the habitats beneath them.



Disinfect footwear to prevent disease spread



Gambusia is an introduced, predatory fish



Do not remove pipes without checking for wildlife



Lift, don't drag materials across vegetation



### 1.3 Herbicide & pesticide use in habitat areas

Avoid chemical use in habitat areas wherever possible.

- SOPA approval is required for any chemical treatment other than glyphosate within the Parklands. Any approval will be location-specific. Typically only cut and paint application of other herbicides will be approved in habitat areas.
- Herbicide must not contain dyes or other additives as these are generally harmful to wildlife.
- Do not use spray application of herbicide within five metres of *Wilsonia backhousei* or *Zannichellia palustris*.
- Avoid spray-drift and resultant non-target impacts to native vegetation. Do not spray pesticides during windy conditions (>15kph), when soil is very wet, during rain, or where rain is forecast within six hours of application.
- Do not mix pesticides within habitat areas.
- Additional requirements apply in frog habitat areas. Spray application of glyphosate (Roundup Biactive or equivalent) may be used in locations specifically approved by SOPA. It is not to be used as a routine management tool (other than for isolated weeds in mulched beds or pavements), as it prevents natural regeneration of native plants.
- Do not spray herbicide within 5m of ponds or wetlands unless specifically approved by SOPA Environment Team. Avoid any application of herbicide at or near breeding ponds November to March, and particularly when tadpoles of any species are present.
- No pesticide of any kind may be applied to turfed lower slopes at the Northern

Water Feature (below the path) over the period November to March, to avoid poisoning frogs that hunt on the lawns at night.

- Do not spray pesticides to 'The Flats' at Newington Armory unless approved by the Environment Team, due to the proximity to Newington Nature Reserve wetland.
- In rehabilitation projects, regrowth of grasses between spray applications must not exceed 150mm and grasses must be still upstanding and not providing habitat.

#### Rodent baits

Owls, magpies, eagles and other birds of prey can die after eating rats and mice that have eaten baits. First generation baits (that require rodents to have more than one dose ) pose less of a risk of secondary poisoning of wildlife than second-generation baits.

Second generation anticoagulant rodenticides (SGAR) are not to be used in the Parklands (see list at right)

### 1.4 Relocating 'at risk' wildlife

Only move wildlife that is injured or is at risk of injury during works; most animals can be gently 'shooed away'. The Parklands Ecologist will advise on the correct location to relocate fauna found during a planned frog clearance.

- Clean hands of chemicals such as nicotine, sunscreen, insect repellent, fuels and other chemicals before handling animals.
- Gently catch lizards or frogs by hand and take them immediately to nearby habitat for release. Lizards may be relocated to the nearest area of thick grass or leaf litter. Take frogs to a nearby suitable freshwater pond and release amongst dense vegetation close to water.

- Moisten any container or plastic bag used to move frogs with a little bottled or pond water (not enough to drown them).
- Do not leave captured wildlife on site or within vehicles, as they can quickly overheat and die.
- Place sick or injured animals in a clean box/container and transport to a local veterinarian or wildlife carer.
- Wash your hands after handling any animals.
- Provide records of all wildlife relocated to the SOPA Contract Manager and the SOPA Parklands Ecologist.
- Do not handle or relocate snakes or tadpoles - contact the Parklands Ecologist for advice on 0409 300 242.

### 1.5 Parklands road rules

Only SOPA authorised vehicles may be driven on Park service roads or lawns. Drivers must display a valid SOPA Service Vehicle Permit and:

- travel at a speed suited to the level of public activity, not exceed 10kph and use flashing hazard lights
- only drive on sealed pathways. Unsealed pathways in Narawang Wetland and Haslams Creek Flats are a no-go zone;
- give way to pedestrians, cyclists and trains; watch for and avoid lizards, turtles and other wildlife;
- park so as to not block pathways or train tracks;
- do not drive, park, damage or turn on areas of long unmown grass, landscaping or other park assets; do not drive or park on turf without specific approval from SOPA;
- relock gates or bollards immediately.

Less harmful first generation compounds:

- Warfarin
- Coumatetralyl

More harmful second generation compounds:

- Brodifacoum
- Bromadiolone
- Difenacoum
- Difethialone
- Flocoumafen



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## 2 Works in or near habitats

Applies to all asset and infrastructure works within of affecting habitats that is not addressed by a works-specific procedure. Examples include capital works, non-routine maintenance activities, installation or repair of underground services, fencing replacement, tidal drainage works, installation or major refurbishment of frog habitat ponds.

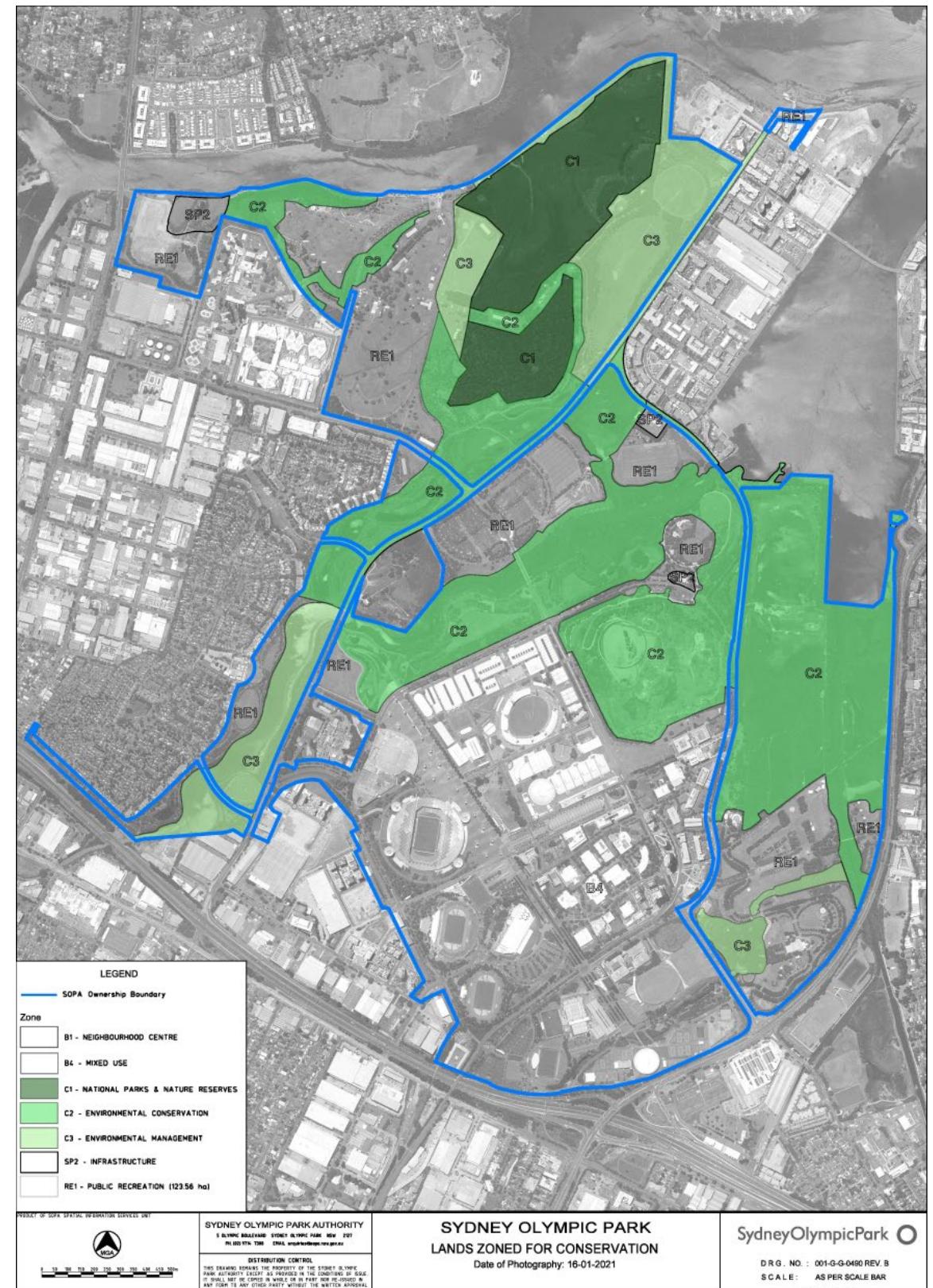
Asset and infrastructure works in or near habitats must be planned and conducted in a way that:

- protects wildlife and vegetation
- complies with regulatory Permits and Licences issued to SOPA under environmental legislation
- complies with planning laws and consents.

New regulatory approvals are likely to be required for works in estuarine areas and waterways, significant impacts to ponds and wetlands, or large-scale removal of habitat. 'Dredging' must be notified to the Minister as per the *NSW Fisheries Management Act 1994*.

Ecological assessment is required for works proposed to be conducted in areas shaded in green (map at right), plus all wetlands, waterways and adjacent riparian lands. This assessment will identify permissibility of the works, regulatory compliance requirements, and the mitigation measures that must be applied to approved works. Risks and mitigative measures will vary with:

- location and habitat type
- proximity to ponds, creeks, bat roosts, nest sites and other sensitive places;
- scale and duration of works;
- season (in relation to wildlife breeding and activity patterns, plant flowering and seed-set, climatic conditions);
- tides, predicted rainfall, water levels.



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## 2.1 Works procedure

This Environmental Procedure applies to assessed and approved works in or near habitats. It may be varied by the Parkland Ecologist if works are determined to be minor and low-risk, or if extra project-specific mitigative measures are required.

Works must not proceed past specified hold points without signoff by the SOPA Project manager and the Project Ecologist or SOPA Environment & Ecology team using the form at right.

### 1. Fully describe works (HOLD POINT)

SOPA Project Manager provides a written description of the nature and location of the works as they affect habitat areas. Required information includes:

- Written description of scope of works, job steps, timing and duration of works
- Site map overlay on air photo showing: mesh fence location, frog fence location, tree protection zones, wildlife protection areas, machinery parking areas, stockpile location, and works compounds

*Project Ecologist will confirm consistency of the works proposal and mitigative measures with SOPA regulatory Licences and Permits, and identify any additional HOLD POINTS to be included in project delivery eg daily frog checks where machinery or materials are kept on site overnight or trenches or pits are not backfilled each day*

### 2. Site preparation requirements (HOLD POINT)

- i. Install red/orange/yellow mesh fencing as per the approved map to clearly separate and identify the worksite and no-go wildlife protection areas.
- ii. Complete a frog clearance over the worksite
- iii. Install temporary frog fencing
- iv. Prune trees where identified in the approved workplan
- v. Ensure all site personnel complete required environmental inductions

*SOPA Project Manager will confirm site preparation activities are completed and ready for Project Ecologist inspection, and arrange attendance by Project Ecologist.*

*Project Ecologist will confirm site preparation requirements are consistent with SOPA regulatory Licences and Permits, and with works-specific measures detailed in the project EMP.*

### HOLD POINT APPROVAL

Works step	Signoff SOPA Project Manager	Signoff Project Ecologist / SOPA E&E
1. Works documentation and map complete (applies to all works)		
2. Site preparation works complete (applies to all works)		
Additional hold points (if identified by Project Ecologist / SOPA E& E during project planning)		

(continued next page)

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## 2.1 Works procedure (continued)

### 3. During works

- i. Comply with the 'General Requirements' at Procedure 1.0 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- ii. Carry a copy of applicable Licences and Permits (as per Licence/Permit conditions) and the project EMP
- iii. Discuss environmental requirements during daily toolbox talks
- iv. Maintain frog fence and mesh fence in a good state of repair. Do not climb over frog fencing, lean tools or bollards on it, attach signs or power cords, or pile materials against it.
- v. No people, tools, materials, or vehicles in no-go wildlife protection areas
- vi. Keep grass within frog-cleared area below 100mm high throughout works
- vii. Don't leave holes, pits, trenches or pipes exposed overnight – backfill them daily. Cap open pipes and hollow poles (eg polypipe, ATF fencing). Don't park machinery within habitat areas overnight  
OR - HOLD POINT for Project Ecologist to conduct frog check each morning prior to start of works
- viii. Remove all litter daily
- ix. Schedule worksite inspections by Project Ecologist or nominee at frequency/ work stages identified in the project EMP

### 4. Reinstatement

Remove frog fence and barrier fence only when works are completed

Leave sediment controls in place until ground is stabilised with mulch or grass

SOPA Project manager responsibilities:

Approve passing of hold points, together with the Project Ecologist

Oversight contractor compliance with this procedure and the project EMP throughout works



**Mesh fencing separates the worksite from habitat areas. Keep grass at <100mm in the worksite so it is unattractive to wildlife.**



**Temporary frog fences prevent frogs from entering worksites that will be established for lengthy periods or in high-risk locations**



**Cap open pipes and hollow poles to prevent lizards and frogs from crawling inside**



**Backfill trenches and pits daily to prevent lizards and frogs from moving into and becoming trapped in holes and under pipes overnight and being smothered when these are refilled**

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## 2.2 Site preparation - frog habitat clearance

Frog habitat clearance is the removal of frogs from a worksite ahead of works to protect them from death or injury. It typically comprises a staged vegetation reduction program combined with hand-searches for remaining frogs.

Habitat is progressively removed over a period of several days, encouraging frogs and other wildlife to relocate of their own accord as the habitat becomes less and less favourable.

Frog clearance is required in all areas of the Park that contain known or potential Green and Golden Bell Frog habitat (Drawing 001-GG-0240).

### Frog habitat clearance - small and low risk sites

*Eg turf adjacent to ponds; sparse groundcover vegetation; small areas of thick grass (less than 5x5m) that are more than 5m away from ponds.*

- i. Mark the boundaries of the works footprint with red/orange/yellow mesh fencing.
- ii. For works of less than a day's duration: hand-search for frogs or other wildlife within the works footprint immediately prior to commencement of works. Particularly search under rocks or loose rubble, thick plant litter, and within the crowns of tussock grasses.
- iii. Where works will continue for more than one day: hand-search for frogs or other wildlife within the works footprint, then immediately slash or cut grasses within the footprint to <50mm using hand tools. Remove cut material from the worksite so that frogs do not shelter under it overnight.

### Frog habitat clearance at large grassy sites

The SOPA Parklands Ecologist will tailor the procedure to the specific site, based on the generic procedure below. Thatch may need to be removed between cuts. Frog clearance will generally not be approved 1 April - 30 September, when frog activity levels are low.

- i. Mark the boundaries of the works footprint with red/orange/yellow mesh fencing.
- ii. Staged cut of vegetation using whipper snipper, slasher or similar:
  - Day 1: Slash vegetation to 200mm
  - Day 2: Hand search for any remaining frogs by trained, authorised personnel; Slash vegetation to <50mm; Commence works.

### Frog habitat clearance within or close to ponds

*The SOPA Parklands Ecologist will tailor the procedure to the specific site, based on the generic procedure below. Frog clearance will generally not be approved when tadpoles are likely to be present (November – March) or when frogs may be in torpor (April – September). Thatch will need to be removed between cuts.*

- i. Mark the boundaries of the works footprint with red/orange/yellow mesh fencing.
- ii. Aquatic vegetation:
  - Lower water levels or pump out pond (where feasible); wait two days.
  - Hand-cut emergent macrophytes as low as possible (do not use brushcutters). Minimise trampling during the works. Continually watch for and relocate any sheltering frogs or other animals. Remove cut material from the works footprint.

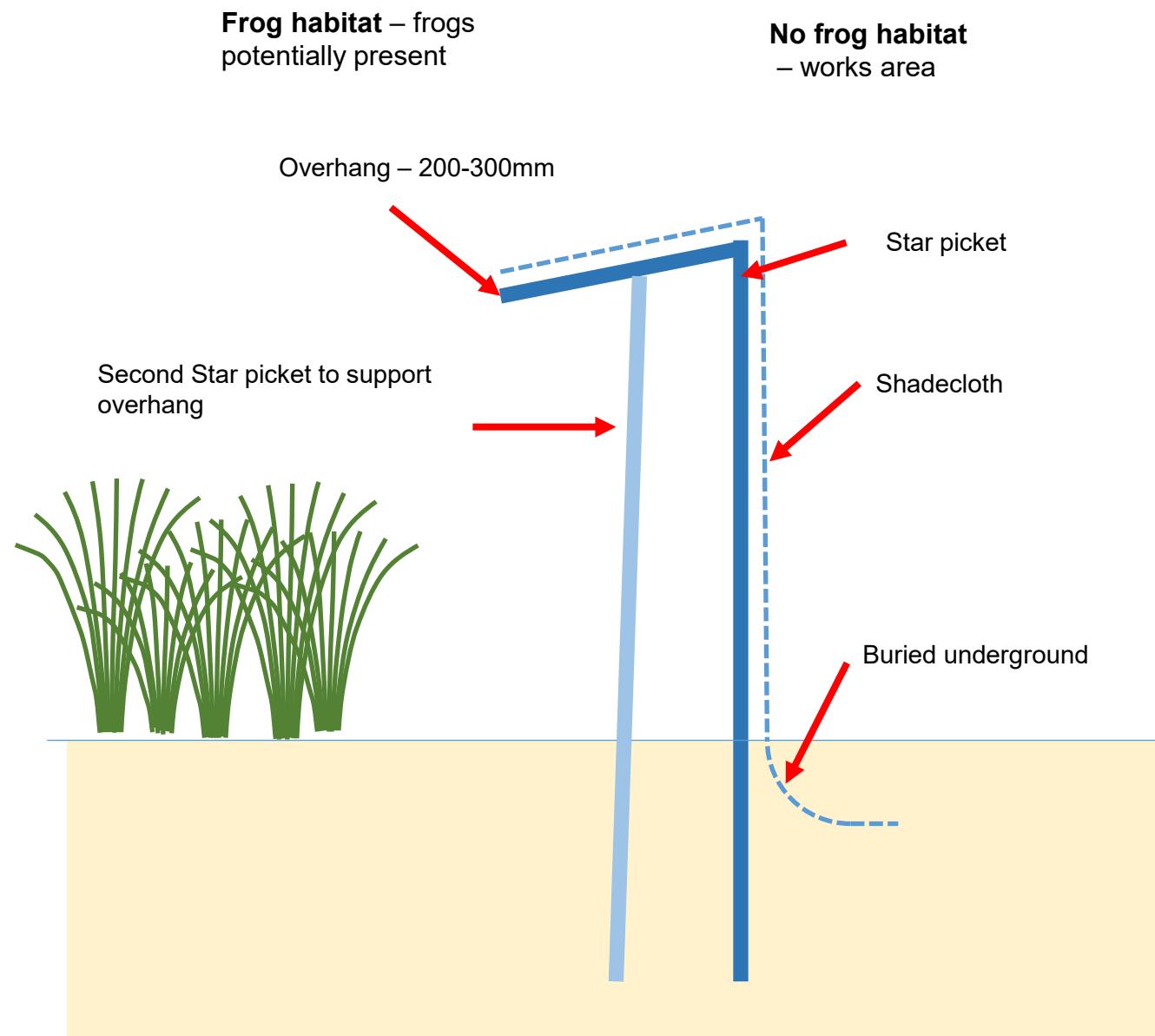
- Either remove cut material on the same day it is cut, or leave it on site to decompose in a location approved by the Parklands Ecologist.
- iii. Terrestrial vegetation
  - Day 1: Slash vegetation to 300mm.
  - Day 2: Slash vegetation to 150-200mm.
  - Day 3: Hand search by trained and authorised personnel for any remaining frogs; slash vegetation to <(50mm); commence works.



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### 2.3 Site preparation - temporary frog fencing

1. Temporary frog fences must be installed around worksites in or near frog habitat areas where there is a high risk of frogs moving onto the worksite during works.
2. The basic design principles are as shown in the diagram (right), and:
3. Fence height to be minimum 1m and star pickets not set more than 2.5m apart.
4. Strength of fence material to reflect the duration of works but to consist generally of black shade cloth (90% & knitted for longer-term works).
5. Overhang to be minimum 200mm in length and set at minimum 30° from horizontal. Supporting star picket to be minimum 100mm from outer edge of overhang.
6. Shade cloth to be attached to frame so as not to cause holes and be tensioned to prevent sagging.
7. Shade cloth base to be buried under minimum 100mm soil or sandbags. Sandbags to be placed end to end with no gaps.



Note: Permanent frog fence specification is at D15/28406

## 2.4 Protecting microbat roosts – buildings, bridges and culverts

Microbats use structures such as buildings, culverts and bridges as roosts and maternity roosts. Maintenance works and building uses that may affect microbats include: activities affecting roofs, eaves or wall cavities; sealing of bat access points; spray application of chemicals; application of odorous chemicals such as paints; works or visitor activities causing loud noise or nocturnal disturbance. Works that disturb the underside of bridges and culverts also pose a risk to microbats.

### Key environmental risks:

- Death or disturbance to roosting bats.
- Disruption to breeding patterns; lack of recruitment.
- Abandonment of young.

### Ecological review requirements:

Ecological review is required for:

- Maintenance works, new building uses or programs in Newington Armory buildings with evidence of current or recent use - Buildings 36, 37, 38, 42, 43.
- Maintenance works, new building uses or programs with a high potential for use because of their roof structure and proximity to the forest – Buildings 44, 45, 127, 128, 129, 130, 131, 132, 133, 134, 136, 154, 158, 160, 161, 163.
- Maintenance works to the underside of all bridges, all frog underpasses, all stormwater culverts over one metre in height.

Inspection of the site by a bat specialist may be required, and seasonal restrictions to works will apply if bat roosts are present.

Ecological review is not required for:

- spray application of herbicide at ground level around buildings using hand-held equipment, to control isolated weeds in hardstand.
- installation of rat bait stations (in enclosed containers) – except where entry to the roof cavity is required between November and March. Second generation anticoagulant rodenticides (SGAR) are not to be used.
- Clearing simple blockages from the opening of stormwater culverts using hand tools.

### Key requirements:

- Building 42, the Holker Street culverts over Narawang Wetland, and any other identified maternity roosts must be protected from disturbance between November and April, when baby bats are likely to be present.
- Comply with the 'General Requirements' at section 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- Low impact visitor programs (eg guided tours in and around the buildings) are generally appropriate around buildings housing microbats; activities that involve loud or sudden noise, bright lights, and evening/nocturnal access are generally inappropriate.



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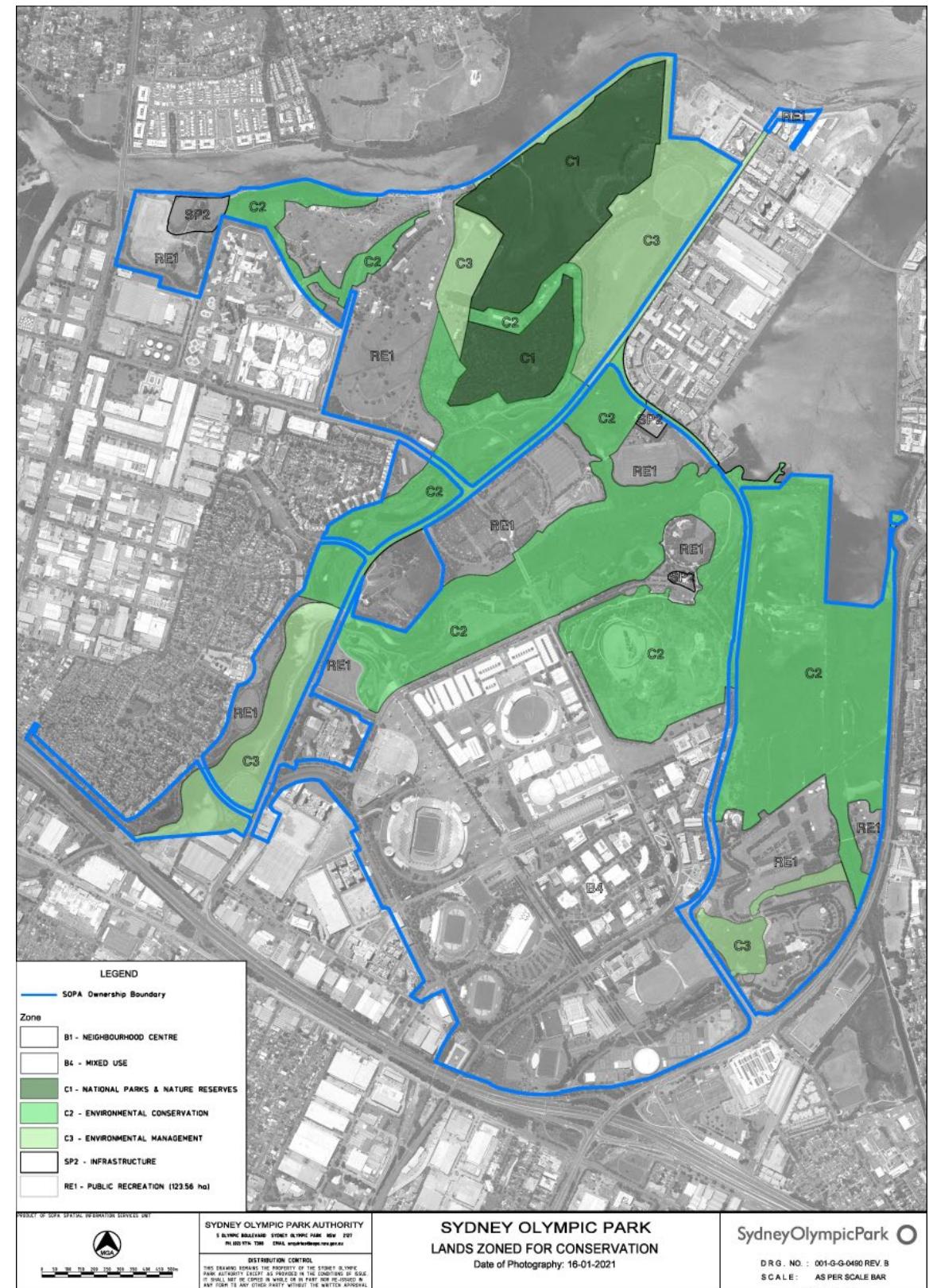
### 3 Asset and Infrastructure – maintenance and operation

The following activity-specific procedures apply to certain routine maintenance works within wildlife habitats.

Asset and infrastructure works in or near habitats must be planned and conducted in a way that:

- protects wildlife and vegetation
- complies with regulatory Permits and Licences issued to SOPA under environmental legislation
- complies with planning laws and consents.

Additional mitigation measures, and/or new regulatory approvals are likely to be required for non-routine maintenance works in estuarine areas and waterways, significant impacts to ponds and wetlands, or large-scale removal of habitat.



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### 3.1 Pathway maintenance

Protocols to protect wildlife and habitats must be implemented when maintaining pathways and pavement within the Parklands. Activities may include pathway, carpark and road repair, large vehicle access, line marking, application of tar to fill cracks, the filling of potholes, horse trail regrading, and asphalt removal and replacement.

#### Key environmental risks:

- Incidental damage to habitats adjoining pathways due to machinery movement, stockpiling, and 'pathway creep' as pathway edges become incrementally wider over time
- Sediment runoff
- Damage to overhanging trees due to oversized machinery
- Death or injury to flora and fauna; disturbance of nesting or migratory birds; tree damage
- Introduction or spread of pests and diseases
- Spills and pollution

#### Key requirements:

- All asphalt repair and resurfacing works, and regrading of the horse trail within the Parklands require ecological review. Special requirements as advised by the Parklands Ecologist will apply to:
  - Works within or adjacent to frog habitat (map 001GG0240)
  - Works within or adjacent to mangroves
  - Works posing a risk to overhanging trees
  - Works conducted at night

- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- Damage to groundcover vegetation must be minimized. No-go zones must be clearly delineated with orange or yellow mesh fencing.
- Within frog habitat areas, a frog habitat clearance is required if vegetation more than 100mm tall will be impacted by the works. Frog habitat clearance will generally not be approved 1 April - 30 September, when frog activity levels are low.
- Trees that are part of an Endangered Ecological Community, that contain nesting hollows, that provide screening, or are otherwise ecologically significant cannot be pruned and machinery will need to be suitably sized to avoid incidental damage.
- No damage to mangroves is to result from pathway works. All machinery must be of a height and width to fit within specified mangrove clearance zones, without causing incidental tree damage. For bitumen pathways these clearance zones are:
  - 1.0 metre horizontally from the path and
  - 3.0 metres vertically from path.
- Pruning of mangroves within approved clearance zones must be approved by the Parklands Ecologist in limited situations and conducted by a SOPA-approved arborist prior to commencement of pathway works and in accordance with *NSW Fisheries Management Act* requirements.

- 'Pathway creep' where paved and adjoining non-vegetated areas become progressively wider with successive works must be avoided.
- Night works are not permitted in or adjacent to areas zoned as E1 or E2 -Environmental Conservation (see map 001PG0047 REV. E), or pathways adjacent to Lake Belvedere.
- Night works may be permitted on the Oulten Ave pathway and pathway between P10F and the Education Centre depending on season and scale, following discussion with the Parklands Ecologist.
- All lights associated with pathway works must be directed away from habitats.



### 3.2 Stormwater system maintenance

Stormwater infrastructure is located within many creeks and wetlands across the Parklands, many of which are in threatened species habitats. Maintenance activities include inspection and routine maintenance of grated drains, drainage pits, gross pollutant traps and litter booms.

Protocols to protect wildlife and wetlands must be implemented when maintaining stormwater infrastructure.

Key environmental risks:

- Harm to protected vegetation such as mangroves and reeds, contrary to regulatory Permit conditions.
- Death or injury to frogs, microbats, and other wildlife sheltering in structures.
- Physical damage to Zannichellia, or smothering by disturbed sediments
- Spills and pollution

Key requirements – all areas

- Comply with the ‘General Requirements’ at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of ‘at-risk wildlife’.
- Note - specialised procedures and access rules apply to stormwater infrastructure within the Brickpit, Newington Nature Reserve and Wilson Park wetland.

Works within or adjacent to frog habitat

Including all drains, pits and outlets in frog habitat (see Drawing 001GG0240) and: GPT85, GPT06, GPT21, GPT22, GPT80, GPT81 or draining to frog habitat: GPT83, GPT24, GPT25. Open drain in the Brickpit.

- Access to structures on foot and using hand tools is permitted.

- Damage to groundcover vegetation must be minimised. No-go zones must be clearly delineated with orange or yellow mesh fencing.
- A frog habitat clearance is required if vegetation more than 100mm tall will be impacted by the works. Frog habitat clearance will generally not be approved 1 April - 30 September, when frog activity levels are low.

Works in mangrove/saltmarsh/Swamp Oak Floodplain Forest

Including assets: GPT05, GPT15, GPT16 & GPT17, Booms 3, 4, 5, 6, 7, 8, 9, 10, 11 & 14.

- The worksite must be clearly marked to identify the extent of works and no-go areas. Areas containing *Wilsonia backhousei* must be flagged and protected from incidental damage.
- Pruning of mangroves within approved clearance zones must be conducted by a SOPA-approved arborist prior to commencement of works where access is impeded, and in accordance with *NSW Fisheries Management Act* requirements (see separate procedure).
- Sediment must not be left onsite but removed and disposed of appropriately.

Works on culverts that may house microbats

Microbats use structures such as buildings, culverts and bridges as roosts and maternity roosts.

- Ecological assessment is required for proposed works to all bridges, frog underpasses or culverts over 1 metre in height. Inspection of the site by a bat specialist may be required, and seasonal restrictions to works will apply if bat roosts are present (see separate procedure).

- The Holker Street culverts over Narawang Wetland, and any other identified microbat maternity roosts must be protected from disturbance between November and April, when baby bats are likely to be present.
- Minor maintenance activities such as the clearing of simple blockages from the opening of stormwater culverts using hand tools is permitted without assessment..

Zannichellia protection

*Zannichellia pallustris* is a threatened aquatic plant found primarily in parts of Boundary Creek and Bennelong Pond.

- Where possible, schedule intrusive works such as dewatering or works affecting known populations to avoid *Zannichellia* flowering/seeding periods (September-December).
- Avoid and minimise staff/contractor entry to Bennelong Pond, and trampling of areas containing *Zannichellia*.
- Install silt curtains or similar around work areas and/or well-established patches.
- If dewatering the pond, minimise the period that it is dry; manually water areas with high species density as required to maintain *Zannichellia* viability.



### 3.3 Water level management of Eastern Pond, Northern Water Feature and Brickpit Reservoir

Ponds that form the WRAMS stormwater harvesting system are also habitat ponds for the endangered Green and Golden Bell Frog. Protocols apply to water level management and pond maintenance in all freshwater ponds across the Park, in accordance with legislative requirements and development consent conditions.

Requirements are detailed below and shown pictorially on the following page.

Environmental risks:

- Temporary loss of Green and Golden Bell Frog habitat.
- Death or injury to Green and Golden Bell Frogs and tadpoles.
- Introduction or spread of *Gambusia holbrooki*.
- Disturbance, death or injury to breeding waterbirds and other fauna.

General pond maintenance requirements

- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- Comply with Procedure 2 for draining, dredging or resetting of ponds.
- Pond draining for maintenance works or for ecological reasons must be scheduled for July/August or April/May, to minimise impacts to breeding frogs and waterbirds.

Water level management objectives - Northern Water Feature, Eastern Pond

- Fluctuate water levels in the macrophyte beds year-round to mimic ephemerality.
- Flood levels not exceeded for more than one week to minimise drowning of macrophytes.
- Water levels cover 2/3 of the macrophyte bed during November-March to maintain base ecological function and macrophyte health.
- Biannual extended drying of the macrophyte bed for 4 weeks August/September. Coordinate timing with maintenance needs and Gambusia management. Eastern Pond and Northern Water Feature to be dried in alternate years.
- Maintain 300ug filter on EWQCP pump to Brickpit Reservoir to prevent Gambusia transfer, in accordance with WRAMS development consent conditions.

Northern Water Feature level management

Sourced from the Operations Manual for Northern Water Feature 2000:

- Summer (Nov-Mar) - Maintain water levels between 2.22 and 2.322 AHD. Only harvest stormwater for WRAMS or irrigation if water levels are above 2.322 AHD.
- Winter (Apr-Oct) maintain water levels between 2.122 and 2.27 AHD. Only harvest stormwater for WRAMS or irrigation if water levels are above 2.27 AHD. Water may be abstracted ONLY for

frog pond filling if water levels are lower than specified.

- After rain, reduce flood levels (>2.422 AHD) within one week to:
  - Winter 2.122 AHD;
  - Summer 2.22 AHD.

Eastern Pond level management

Sourced from the Operations Manual for Eastern Water Quality Control Pond 2000:

[Note: 1.7 AHD = base of outer gabion; 2.3 AHD = weir overtops]

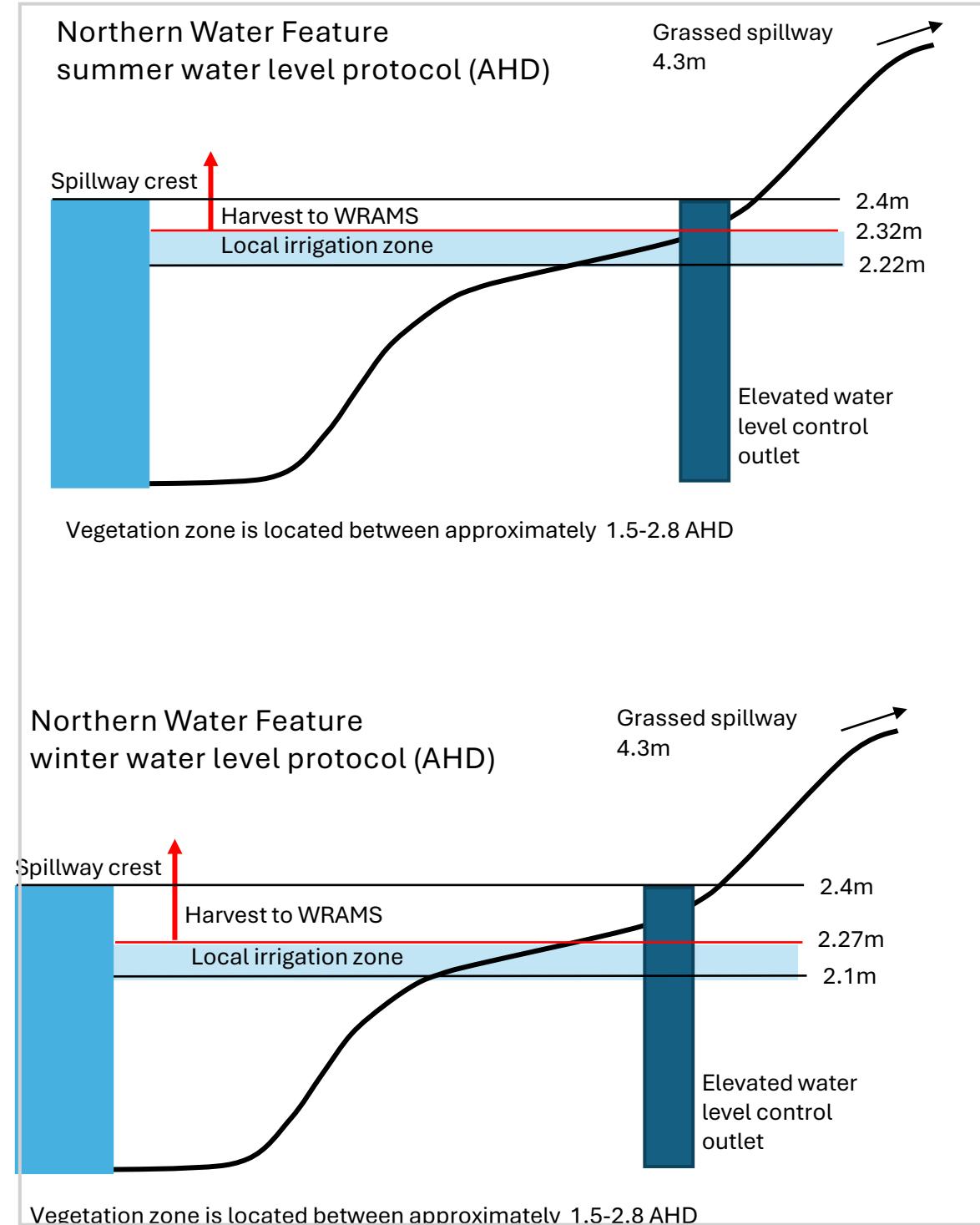
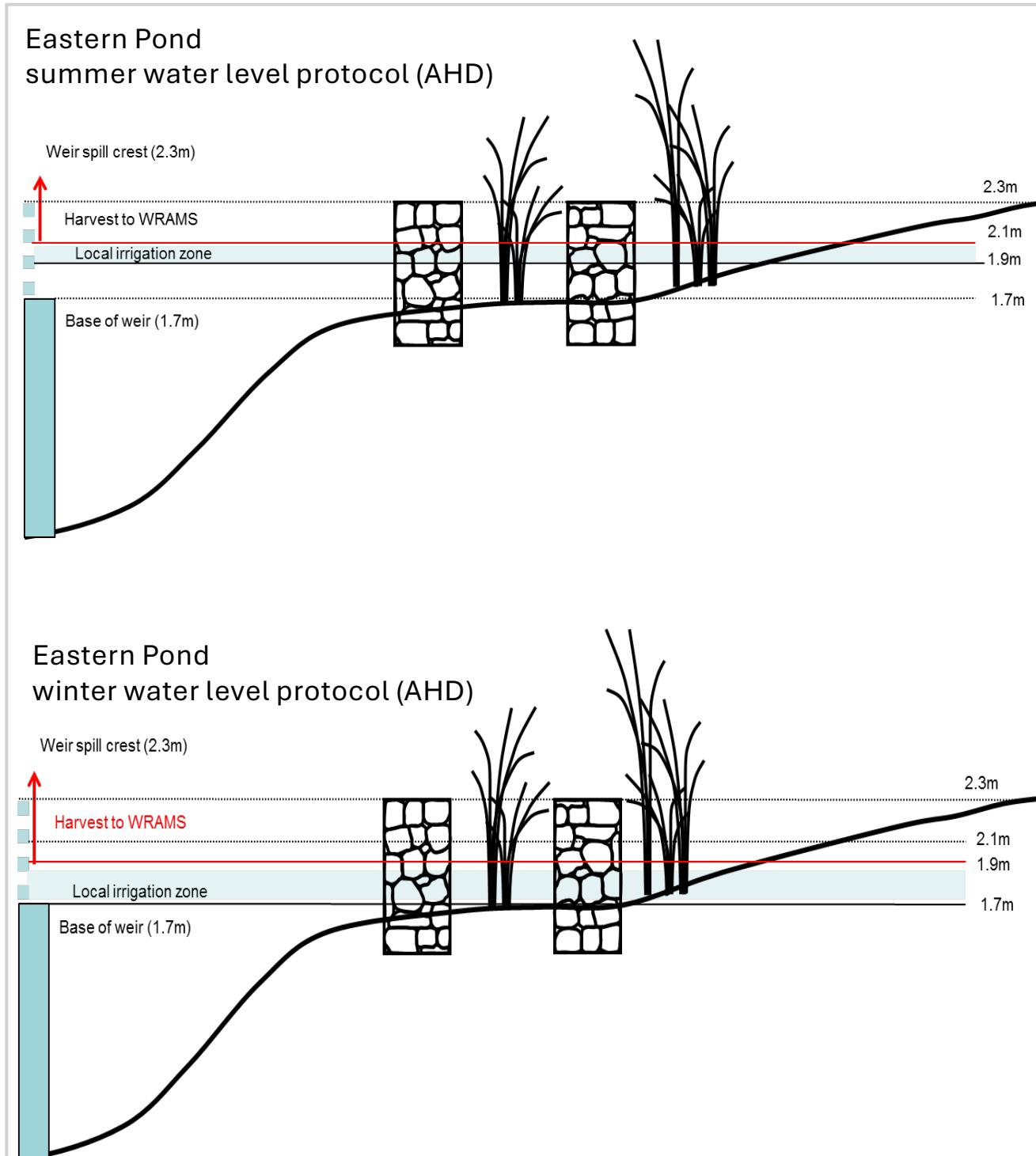
- Summer (Nov-Mar) - maintain water levels between 2.1 and 1.9 AHD. Only harvest stormwater for WRAMS if water levels are above 2.1 AHD.
- Winter (Apr-Oct) - maintain water levels between 2 and 1.7 AHD. Only harvest stormwater for WRAMS or irrigation if water levels are above 2 AHD.
- Manually remove weir boards if water has remained above the flood level (RL2.3 AHD) for more than one week and the WRAMS reservoir is full.

Brickpit Reservoir level management

- Maintain a free-board of minimum 500mm
- Cease transfers into the Reservoir at RL 82.5
- Commence pumpout to Eastern Pond at RL 83.0 and lower Reservoir to 82.5



### 3.3 Water level management of Eastern Pond, Northern Water Feature and Brickpit Reservoir (continued)



### 3.4 WRAMS operations

Protocols to protect the endangered Green and Golden Bell Frog and comply with development consent conditions must be applied during WRAMS operations. WRAMS infrastructure is located within frog habitat both in Wentworth Common and on the floor of the Brickpit. WRAMS operation involves harvesting of water from frog habitat in the Eastern pond into the Brickpit Reservoir. There is provision for emergency discharge from the WRAMS treatment plant into the Eastern Pond.

#### Environmental risks

- Introduction of *Gambusia holbrooki* into the Brickpit (the Brickpit is currently free of this pest fish)
- Flooding of Brickpit frog habitats due to overtopping of the Reservoir.
- Damage to Green and Golden Bell Frog habitat.
- Disturbance, death or injury to Green and Golden Bell Frogs, disturbance to life cycle, disturbance to other wildlife.
- Eutrophication of Brickpit, Eastern Pond, frog ponds.
- Introduction of other pests and disease organisms such as Phytophthora, chytrid, weeds.

Development consent DA S38/3/99 contains specific compliance conditions relevant to WRAMS operation.

#### Key requirements::

##### 1. Inductions and Brickpit access

All activities must comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.

All personnel working at the Eastern Pond or Brickpit must complete an annual ecological induction, including a Brickpit Access Induction.

- All access to the Brickpit must comply with Brickpit access procedures.
- Regular staff named on the Brickpit Authorised Access List may access the Brickpit as required to undertake routine or emergency maintenance works. They may escort additional personnel into the Brickpit as required and are responsible for ensuring any such personnel are given a visitor Induction briefing and comply with access and biosecurity requirements.
- Within the Brickpit, vehicles may only be driven or parked on service tracks or the cleared parking area adjacent to the pump station. Gates into the Brickpit must be kept locked at all times.

##### 2. Biosecurity

All care must be taken to prevent introduction of *Gambusia* into the Brickpit, including implementation of the biosecurity measures detailed on the following pages. The filter from the Eastern Pond must be kept in good order and repair; stormwater must not be pumped into the Brickpit if at any stage the filter is not operational.

#### Comply with DA consent condition:

*Measures such as mechanical screening and regular monitoring of imported water, and diversion of inflow where necessary shall be undertaken to minimise the occurrence of Gambusia and other contaminants in the storage reservoir in the Brickpit. If Gambusia are detected in the storage reservoir then measures shall be undertaken to control and if possible to eradicate them. [DA S38/3/99].*

##### 3. Maintenance works to Reservoir or Eastern Pond

Maintenance or upgrade works that involve the activities listed below require environmental assessment, submission of a works-specific environmental management plan, and approval of Director Urban Renewal & Environment:

- cranes, boats or other machinery to be brought into the Brickpit;
- access to or draining of Eastern Pond;
- excavation, removal of vegetation, or damage to vegetation around the Eastern Pond, the Water Treatment Plant or the Brickpit.

A frog habitat clearance is required if vegetation more than 100mm tall will be impacted by any works. The Parklands Ecologist will tailor the works procedure to the specific site. Frog habitat clearance will generally not be approved 1 April - 30 September, when frog activity levels are low.

(continued over page)



### 3.4 WRAMS operations (continued)

#### 4. Water quality requirements

Comply with DA consent condition:

- *WRAMS operation will ensure that water derived from the Water Reclamation Plant (WRP) and discharged into the Brickpit shall not exceed 1mg/litre of phosphorus, or such other higher level as may be agreed with the Department of health and the EPA. [DA S38/3/99].*
- *Should it be desired to use water from the storage pond in the Brickpit for filling frog habitat ponds, the water shall be firstly sampled and tested to confirm that it is suitable for this purpose. [DA S38/3/99].*

#### 5. Reservoir management

Comply with DA consent condition:

- *The water storage shall be maintained at a level sufficient to contain runoff from the Brickpit catchment during a severe storm event and prevent overtopping and flooding of breeding and foraging habitat for the Green and Golden Bell Frog. This will reduce the risk of water which may be contaminated with Gambusia or other contaminants from reaching frog habitat. The normal maximum operating storage level shall be set such that the reserve storage space created above it will be sufficient to contain a 1 in 100 year storm (half hour duration). [DA S38/3/99] (note this equates to 0.5m measured at the lowest point of the Reservoir wall).*

To comply with the above consent condition, stormwater must not be pumped into the Brickpit when the Reservoir level exceeds RL82.5. Water must be actively pumped out of the Reservoir when Reservoir level exceeds RL83.0, to prevent overtopping.

If the water depth on level 2 of the Reservoir falls to 50cm depth, it is likely to be colonised by frogs, and ecologist advice is required before refilling.

#### 6. Stormwater harvesting from the Eastern Pond

- *Maintain minimum ecological water depths in the Eastern Pond. Only harvest stormwater from the Eastern Pond if water levels are above:*
  - *Winter (April to October) > 2 AHD;*
  - *Summer (November to March) > 2.1 AHD.*

#### 7. Discharge from WTP to Eastern Pond

Comply with DA consent condition:

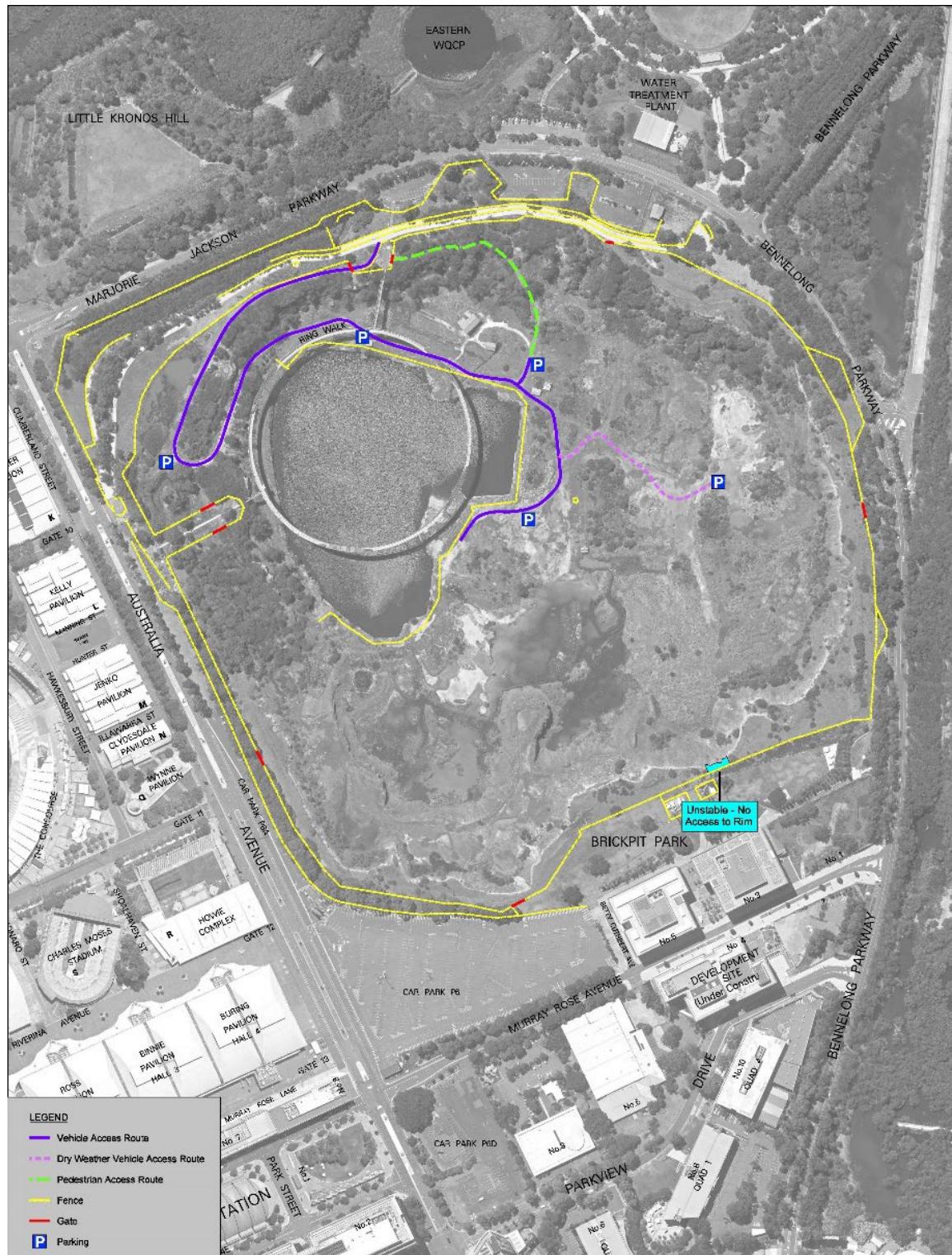
- *In the event of any discharge from the WTP to the Eastern Pond, the applicant shall immediately monitor the impact of the discharge on the Green and Golden Bell Frog population present. Should a suitably qualified expert consider it necessary to remove frogs and/or tadpoles, this shall be done in accordance with Condition 33(c) with the frogs and/or tadpoles returned to the Eastern Pond once the threat has passed. [DA S38/3/99].*

#### 8. Lighting

Comply with DA consent condition:

- *Lighting associated with the landscaping and operation of the WTP and particularly the 24-hour visitor centre, shall be designed to minimise light spillage and glare and to have no adverse impact on any identified frog habitat. [DA S38/3/99].*





- LEGEND**
- Vehicle Access Route
  - Dry Weather Vehicle Access Route
  - Pedestrian Access Route
  - Fence
  - Gate
  - P Parking

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**SYDNEY OLYMPIC PARK**  
 THE BRICKPIT NATURAL AREAS  
 ACCESS ROUTES AND GATES  
 Date of Photography: 10-02-2019

SydneyOlympicPark

D.R.G. NO.: 0014-G-0285 REV. G  
 SCALE: AS PER SCALE BAR



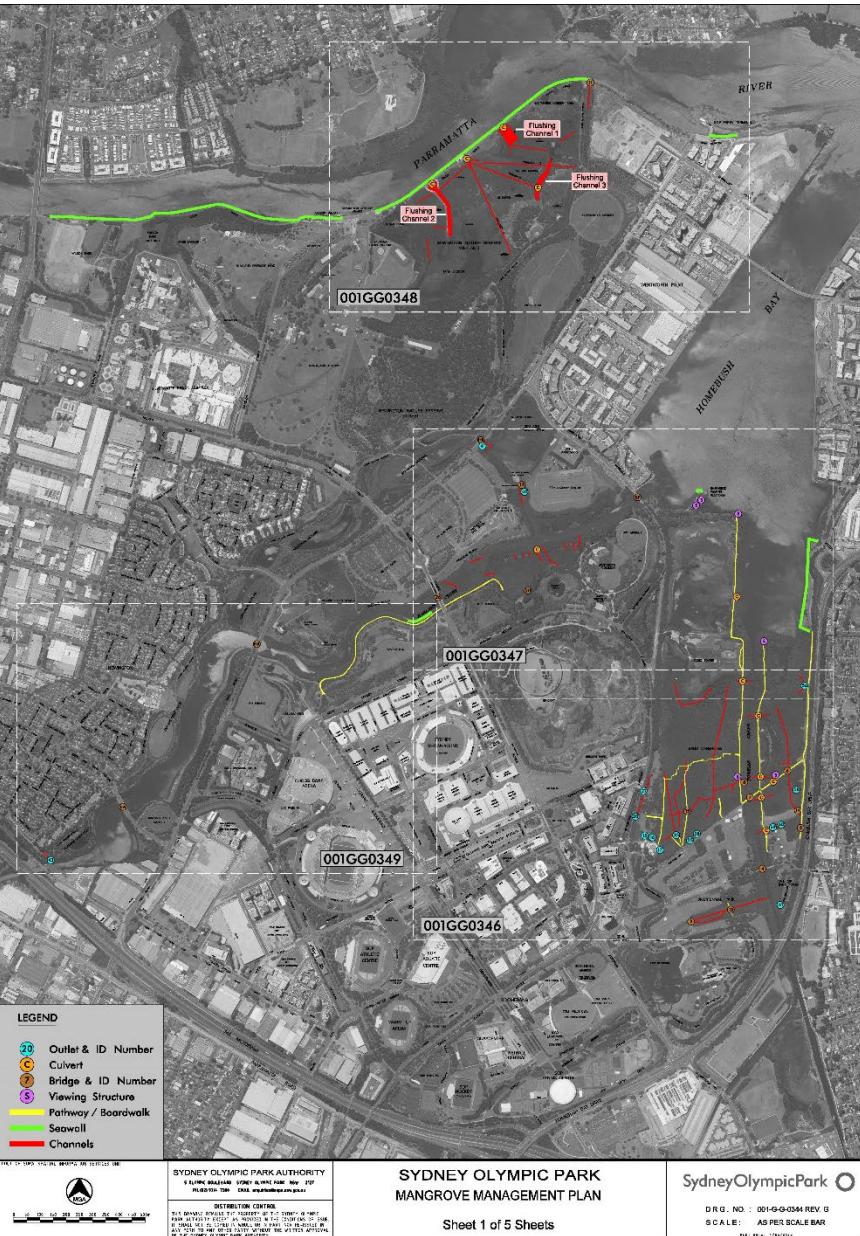
- LEGEND**
- Frog Habitat
  - Frog Pond
  - Frog Fence
  - Frog Underpass / Culvert
  - Parkland Zone Boundary

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**SYDNEY OLYMPIC PARK**  
 THE BRICKPIT  
 GREEN and GOLDEN BELL FROG HABITATS  
 MAP 4

SydneyOlympicPark

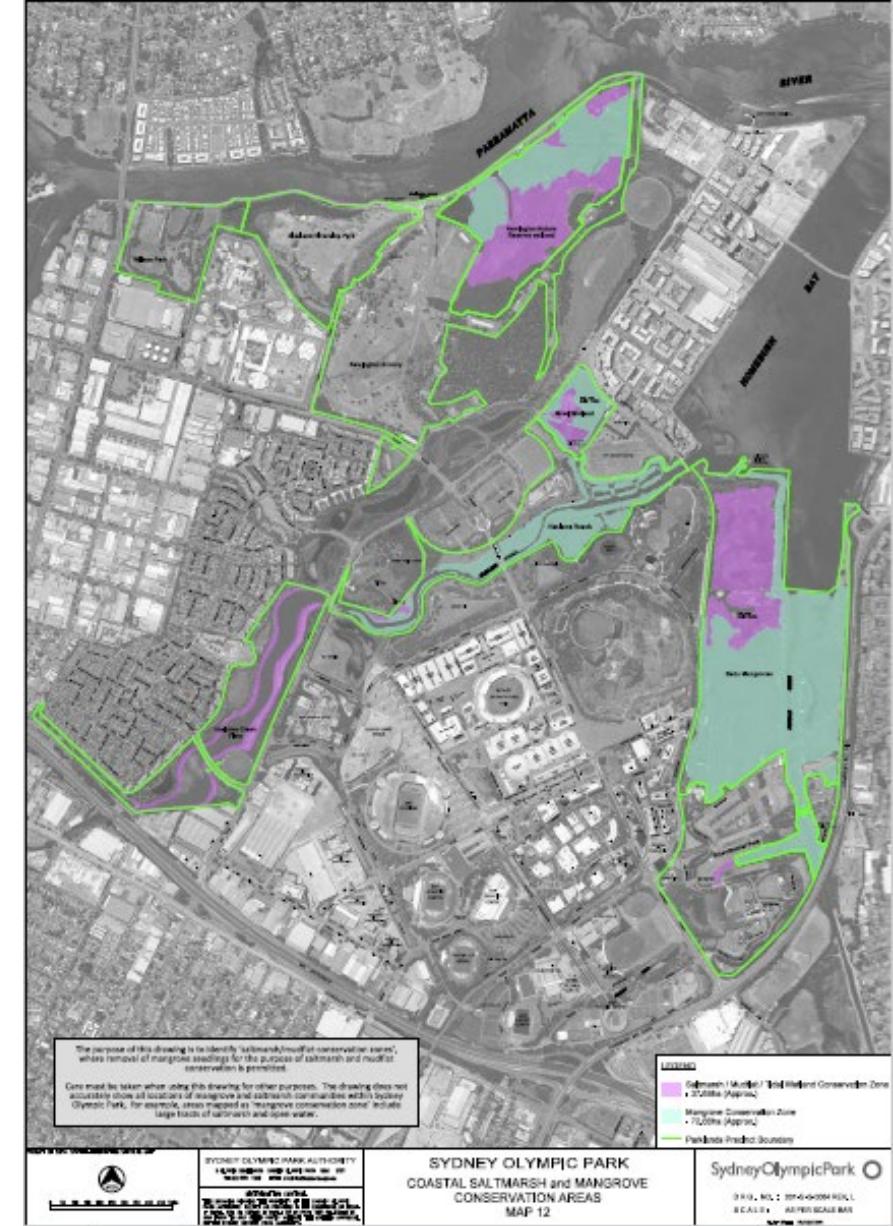
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 SCALE: AS PER SCALE BAR



Stormwater infrastructure located within mangrove forest.



Sydney Olympic Park frog habitats



Coastal Saltmarsh and mangrove distribution at Sydney Olympic Park

April 2025

### 3.5 Leachate system management

#### Description of activity

Protocols to protect wildlife apply to maintenance of leachate infrastructure including rising mains, pump pits and treatment wetlands situated within Green and Golden Bell Frog habitats.

Leachate generated by the Park's remediated landfills is collected, transferred and treated by a system of drains, rising mains, pump pits and treatment wetlands. Operation of the system and discharges of treated leachate is regulated under the *Contaminated Lands Management Act 1997* and the *Protection of the Environment Operations Act 1997*. Green and Golden Bell Frog (GGBF) habitat was built on many of these landfills following their remediation to offset against the destruction of frog habitats occurring during redevelopment of the Park in the 1990s. Management of this habitat is regulated under the *Biodiversity Conservation Act 2016* and the *Environment Protection & Biodiversity Conservation Act 1999* (Commonwealth).

#### System elements & ecological risks

##### Remediated landfills and associated pipe networks, pump pits and piezometers

Landfills situated within GGBF habitat are: Kronos Hill, Wentworth Common, Blaxland Riverside Park, Wool-la-ra and Haslams Reach/P5.

Routine management activities include:

- inspections and monitoring;
- capping maintenance;
- pump pit servicing and repair;
- maintenance and repair of above-ground infrastructure in vegetated and unvegetated locations
- SCADA system maintenance and repair
- excavation for urgent pipe and drain repair.

Risks to GGBF:

- trampling of frogs within long grass or reeds;
- drowning of frogs trapped in pump pits;

- injury, death or loss of habitat during excavation works.
- entrapment of frogs in pits , open pipes, or rubbish removed from site

##### Narawang Wetland infrastructure

Infrastructure situated within Narawang Wetland includes:

- rising main for the Woo-la-ra landfill;
- pump pits associated with the Hill Road Cut-off Wall.

Routine management activities include:

- inspections and monitoring
- pump pit servicing, repair and pump-out;
- excavation for urgent pipe and drain repair.

Risks to GGBF:

- trampling of frogs within long grass or reeds;
- drowning of frogs trapped in pump pits;
- Injury, death or loss of habitat during excavation works.
- Entrapment of frogs in pits , open pipes, or rubbish removed from site

##### Blaxland leachate treatment wetlands

GGBF colonised the wetlands soon after their 2015 commissioning, and several large-scale breeding events have since been recorded. Effective functioning of the wetland treatment system requires a healthy microbiological population, which is associated with a healthy macrophyte bed; this typically aligns with GGBF habitat needs.

GGBF and other frog species are found trapped within pump pits adjacent to the wetlands; attempts to exclude frogs from them have been largely unsuccessful.

Routine management activities include:

- inspections and monitoring;
- addition of leachate of varying levels of chemical contamination; addition of stormwater; addition of

chemicals, discharge of treated leachate;

- lawn mowing and herbicide application around the ponds;
- management of wetland plants within the ponds including harvesting and re-sets;
- pump pit servicing and repair;
- excavation for urgent pipe and drain repair;
- SCADA system maintenance and repair (including electrical and comms systems).

Risks to GGBF:

- exposure to leachate;
- trampling of frogs within long grass or reeds;
- drowning of frogs trapped in pump pits;
- entrapment of frogs in pits or open pipes
- injury, death or loss of habitat during mowing, herbicide spraying or excavation;
- removal of stored materials (pipes, greenwaste, rubble, shade cloth) in which frogs are sheltering.
- water turbidity and resultant harm to tadpoles due to walking through wetlands or otherwise stirring up sediment
- harm to adults and/or temporary or permanent loss of habitat during periodic large-scale wetland vegetation clearance to reset/replace the macrophyte bed or due to vegetation dieback;
- death of tadpoles due to drawdown of water levels during the breeding season (typically November -March).

Continued next page

April 2025

## 3.5 Leachate system management (continued)

Haslams Reach leachate evaporation ponds

These ponds generally require very little maintenance intervention. Leachate typically has low-grade contaminants; it is discharged into the first of eight vegetated earthen-lined ponds and cascades through them, with most leachate evaporating over time. The ponds can dry out over summer.

Routine management activities include:

- Inspections and monitoring;
- addition of leachate of varying levels of chemical contamination;
- vegetation management within and around the ponds including harvesting and re-sets;
- pipe (inlet and outlet) servicing and repair, including excavation for urgent repairs.

Risks to GGBF:

- exposure to leachate;
- trampling of frogs within long grass or reeds;
- drowning after becoming trapped in pump pits; entrapment in open pipes
- injury, death or loss of habitat during mowing, herbicide spraying or excavation works;
- removal of stored materials (pipes, greenwaste, rubble, shade cloth) in which frogs are sheltering;
- pond turbidity and resultant harm to tadpoles due to walking through ponds or otherwise stirring up sediment ;
- harm to adults and/or temporary or permanent loss of habitat during periodic large-scale vegetation clearance to reset/replace the macrophyte bed or due to vegetation dieback;
- death of tadpoles due to drawdown of water levels during the breeding season (typically November - March).

Risks to Zannichellia:

- dessication as ponds dry out; trampling

**Key requirements**1. Key requirements – all works

Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.

2. Emergency works

The leachate system is managed to protect human health and prevent pollution of the environment, in accordance with regulatory requirements. In emergency situations, the requirements of this environmental procedure will be applied to the extent practicable, however recognising that there may be situations where an immediate response and/or emergency works are required that may necessitate works resulting in direct or indirect impacts to frogs or frog habitat.

3. Works not covered by this standard procedure

Environmental Procedure 2 *Works in habitats* applies to new infrastructure and to planned system upgrades and to planned maintenance/replacement works where works are situated in habitat areas.

This includes:

- piezometers, pipework, pump pits, or other system components;
- new leachate treatment systems;
- planned major works to treatment ponds (including pond resets and large-scale reed replacement);
- planned major repairs to system components including excavation.

4. Emergency repairs requiring excavation

Where works are situated within habitat areas:

- Minimise the extent of grassy habitat impacted by trampling or machinery. Clearly mark the works footprint with red/orange/yellow mesh fencing to identify the extent of works and no-go areas. Keep people, tools, materials and vehicles within demarcated area.
- Where practicable, apply frog clearance procedures detailed in Environmental Procedure 2 *Works in and near habitats* prior to impacting any vegetation.

Continued next page

April 2025

## 3.5 Leachate system management (continued)

5. Blaxland Treatment wetlands; Haslams leachate evaporation ponds

## (a) Routine requirements

- Mown lawns surrounding the Blaxland wetlands are not to exceed 150mm between mowings. Should lawns exceed this length, frog clearance procedures incorporating staged slashing and search for sheltering frogs is required.
- Loose materials, equipment and greenwaste that may be colonised by frogs must generally not be stored around the wetlands – frog clearance may be required for materials stored overnight.
- Schedule annual soft landscape maintenance access to the wetlands (eg for weeding, thinning of reeds) in September/October, (prior to the peak frog breeding season of November to March). Schedule only undertake minor maintenance weeding at other times of the year.
- Check tadpole and Zannichellia status of the wetlands with an ecologist before entering waterbodies and avoid entering wetlands where tadpoles are present (typically November to March). Where entry is necessary and tadpoles are present, minimise trampling of reeds and minimise stirring up mud and sediment. Take care to not pierce or otherwise damage pond liners.
- Inspect pump pits at the Blaxland treatment wetlands for frogs and tadpoles within the pump pits at least once a week. Rescue and relocate any animals found – release into water into the wetlands. *(attempts to exclude frogs and tadpoles from pump pits have been largely unsuccessful, and animals can become trapped within them and are at risk of drowning. Mitigation of this risk is dependent upon regular checks of pump pits and rescue of trapped animals).*

## (b) Large-scale macrophyte removal/reset

Frog mitigative measures must be applied in all planned works, and to the extent practicable for emergency works:

- Environmental Procedure 2 *Works in and near habitats* will be applied; ecological advice and frog clearance procedures will be included in planning of the works.
- Where possible, works will be scheduled in September/October and avoided from November to March.
- Only one of the two ponds at the Blaxland treatment wetlands will ordinarily be worked at a time.

## (c) Draw-down of wetland water levels (Blaxland treatment wetlands)

- Drawdown of the wetland will seek to avoid and minimise harm to tadpoles over the period November to March. Other than in an emergency situation, pumpout will generally cease when water levels fall below 10cm deep in more than 2/3 of either pond, unless it is confirmed that no tadpoles are present.
- tadpole relocation will be undertaken by trained personnel under the direction of an ecologist:
  - where drawdown is required for non-emergency operational purposes.
  - in emergency situations where circumstances permit.

[In times of drought, leachate generation and extraction rates drop water levels may naturally fall below 10cm or the wetlands dry out.]



**LEGEND**

— SOPA Ownership Boundary

**Zone**

- B1 - NEIGHBOURHOOD CENTRE
- B4 - MIXED USE
- C1 - NATIONAL PARKS & NATURE RESERVES
- C2 - ENVIRONMENTAL CONSERVATION
- C3 - ENVIRONMENTAL MANAGEMENT
- SP2 - INFRASTRUCTURE
- RE1 - PUBLIC RECREATION (123.56 ha)

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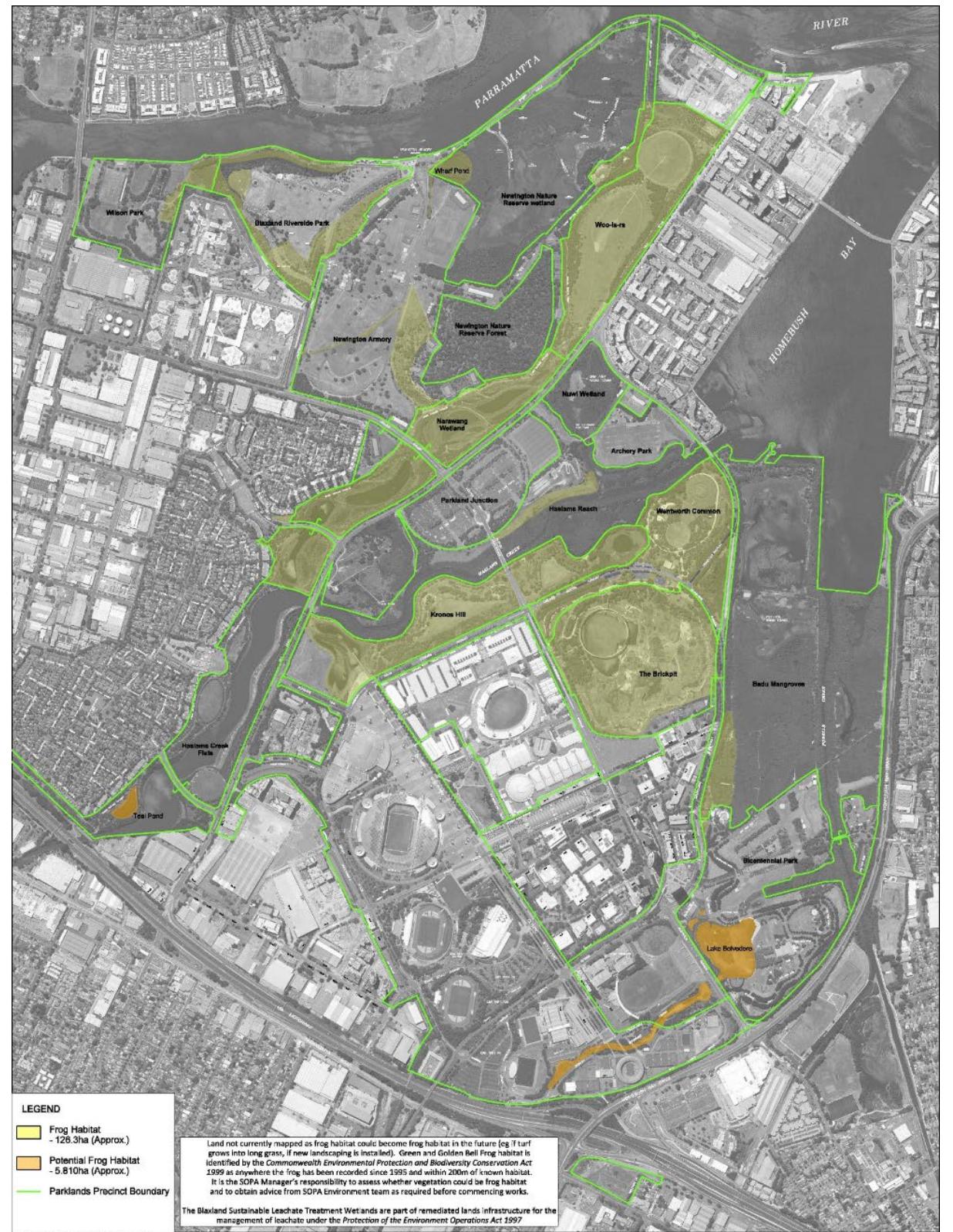
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**SYDNEY OLYMPIC PARK**  
**LANDS ZONED FOR CONSERVATION**  
 Date of Photography: 16-01-2021

**SydneyOlympicPark**

D.R.G. NO. : 001-G-G-0490 REV. B  
 SCALE : AS PER SCALE BAR  
 PLOT DATE: 24/02/2021



**LEGEND**

- Frog Habitat - 128.3ha (Approx.)
- Potential Frog Habitat - 5.810ha (Approx.)
- Parklands Precinct Boundary

Land not currently mapped as frog habitat could become frog habitat in the future (eg if turf grows into long grass, if new landscaping is installed). Green and Golden Bell Frog habitat is identified by the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 as anywhere the frog has been recorded since 1995 and within 200m of known habitat. It is the SOPA Manager's responsibility to assess whether vegetation could be frog habitat and to obtain advice from SOPA Environment team as required before commencing works.

The Blaxland Sustainable Leachate Treatment Wetlands are part of remediated lands infrastructure for the management of leachate under the Protection of the Environment Operations Act 1997

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**SYDNEY OLYMPIC PARK**  
**FROG HABITATS**  
**MAP 3**  
 Date of Photography: 10-02-2019

**SydneyOlympicPark**

D.R.G. NO. : 001-G-G-0240 REV. M  
 SCALE : AS PER SCALE BAR  
 PLOT DATE: 10/02/2019

### 3.6 Litter collection from creeks and wetlands (contractors)

Protocols to protect wildlife and plant communities must be implemented when removing litter from creeks, ponds and wetlands.

Key environmental risks:

- Trampling of saltmarsh, mangroves, reeds and other vegetation.
- Introduction of *Gambusia holbrooki* into 'clean' ponds.
- Disturbance to nesting birds and other sensitive life cycle stages.
- Accidental removal of frogs and lizards sheltering within litter.
- Crushing of fauna sheltering under litter.

Requirements – all areas:

- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- ensure wildlife is not trapped inside bottles or containers and carried off-site; Be alert for frogs and lizards that may be on, in or under litter – look inside open containers and pipes - encourage any animals to jump away before bagging.
- Lift and carry tools and bags of litter – do not drag them across vegetation.

Requirements in estuarine areas:

Estuarine areas include Haslams Creek embankments, mangrove forest in Bicentennial Park.

- Schedule works during low tide (tides at Sydney Olympic Park are approximately half an hour behind tides at Fort Denison).
- Prevent weed and disease transfer to and within the Park - estuarine areas contain *Gambusia holbrooki* – avoid transfer of this fish to freshwater wetlands by cleaning tools and boots at completion of works.
- Minimise trampling of saltmarsh, mudflats and pneumatophores when conducting works. Try to walk only on bare ground. Where you must walk on vegetation, try to avoid succulent plants. Vary your route to avoid forming a track, and if there are several people working, don't walk in single file to avoid concentrating any impacts.

Requirements in freshwater ponds

Freshwater ponds include Northern Water Feature and Lake Belvedere.

- On any given day, work in freshwater ponds BEFORE estuarine ponds, and the Northern Water Feature BEFORE Lake Belvedere, to avoid transfer of the pest fish gambusia between ponds. The Northern Water Feature is currently free of gambusia.
- Aim to schedule works when water levels are low and edges of ponds are exposed.
- Avoid disturbance to reeds as these are wildlife habitat – stay on turf or mudflats.



### 3.7 Litter collection by volunteers

Protocols to protect wildlife and plant communities must be implemented when removing litter from parklands habitats.

Key environmental risks:

- Trampling of saltmarsh, mangroves, reeds and other vegetation.
- Introduction of *Gambusia holbrooki* into 'clean' ponds.
- Disturbance to nesting birds and other sensitive life cycle stages.
- Accidental removal of frogs and lizards sheltering within litter.
- Crushing of fauna sheltering under litter.

**SOPA manager responsibilities**

For all litter collection activities proposed in the parklands:

- Include the requirements of this Environmental Procedure together with any site-specific or season-specific requirements advised by the Parklands Ecologist in:
  - program design
  - works instructions
  - works scheduling
  - participant Code of Conduct documentation
  - induction briefings
- Induction requirements for litter collection are:
  - SOPA program leaders: Program-specific induction delivered by SOPA Environment
  - Community team leaders – induction delivered by trained SOPA personnel approved by Senior Manager Environment & Ecology
  - Community participants – induction delivered by trained community team leaders
- Monitor overall numbers of program participants and the leader to participant ratio. Ratio should not exceed one leader to 15 participants.
- Oversight participant compliance during the program.
- Provide program leaders with copies of applicable Licences and Permits to carry on site when working in threatened species habitats (as per Licence/Permit conditions).
- Note that water-based litter collection by volunteers (eg from a kayak or canoe) is not permitted.



Be careful where you place your feet – watch out for chicks!



Lift, don't drag materials across vegetation



Animals will use rubbish as shelter – do not remove without checking!

Continued next page

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### 3.7 Litter collection by volunteers (continued)

#### Environmental requirements

##### Pathways and grasslands

*Litter collection within one metre of pathways anywhere within Sydney Olympic Park. Work is typically done by individuals on a casual basis.*

- i. Prevent the spread of weeds, pests and diseases - clean mud and seeds from tools, boots and clothing at start and end of works.
- ii. Avoid trampling plants, rocks and branches beside pathways – they may be sheltering wildlife. Stay on pathways where possible, and if not, try to walk only on bare ground. Keep pets on pathways.
- iii. Be aware of fire risk – do not smoke in grassland or bushland.
- iv. Remove all personal litter- including cigarette butts, chewing gum and fruit peel.
- v. Be alert for nesting birds in grassland and bushland – give them a wide berth and don't try to photograph nests as parents may abandon them if scared away.
- vi. Be aware that litter may be sheltering frogs and lizards – look inside open containers and pipes before bagging them. Lift larger litter carefully without rotating it to avoid crushing of any wildlife sheltering underneath. Leave litter in place if it is sheltering wildlife. Call Park Rangers to report injured wildlife.
- vii. Do not break branches off trees or shrubs; do not pick flowers or any other part of a plant.
- viii. Recreational use of drones is prohibited across Sydney Olympic Park

##### Tidal areas, Lake Belvedere, Northern Water Feature

###### Preparation

- i. Wear a volunteer vest when working more than a metre from pathways or within wetlands, and leave pets at home.
- ii. Work on the Newington side of Haslams Creek can be done casually; work on the Hill Road side of Haslams Creek must be scheduled in consultation with SOPA. Scheduling of work in Badu Mangroves must be

approved by Senior Manager Environment & Ecology.

- iii. Schedule works in saltmarsh or mangroves during low/incoming tides (note tides at Sydney Olympic Park are approximately half an hour behind tides at Fort Denison).
- iv. Work along the paved edges of Lake Belvedere can be done casually; work on vegetated edges or in any other wetland must be approved by the Senior Manager Environment & Ecology. Scheduling will account for the breeding seasons of frogs and birds.
- v. Ensure all team members are inducted and can recognise:
  - vi. saltmarsh plants and mangrove pneumatophores. (Haslams Creek, Badu Mangroves)
  - vii. Gambusia (Lake Belvedere, Northern Water Feature)

###### On-ground

- viii. Ensure there is no cross-over of people working in tidal waters and freshwaters, to manage risk of gambusia transfer.
- ix. Prevent the spread of weeds, pests and diseases - clean mud and seeds from tools, boots and clothing at start and end of works.
- x. Be aware of fire risk – do not smoke in grassland or bushland.
- xi. Remove all personal litter- including cigarette butts, chewing gum and fruit peel.
- xii. Be alert for nesting birds in grassland and bushland – give them a wide berth and don't try to photograph nests as parents may abandon them if scared away.
- xiii. Be aware that litter may be sheltering frogs, lizards and crabs – look inside open containers and pipes before bagging them. Lift larger litter carefully without rotating it to avoid crushing of any wildlife sheltering underneath. Leave litter in place if it is sheltering wildlife. Call Park Rangers to report injured wildlife.
- xiv. Do not break branches off trees or shrubs; do not pick flowers or any other part of a plant.
- xv. Grassy frog habitats, reeds, mangroves and saltmarsh are very sensitive ecological

environments, and are protected under environmental legislation. Some degree of trampling is inevitable during the clean up. To minimise damage::

- try to walk only on bare ground;
  - where you must walk on vegetation try to avoid succulent plants and especially *Wilsonia backhousei* in tidal areas, and reeds in freshwater ponds
  - avoid the formation of a compacted track -spread out rather than walking single file;
  - in mangroves, avoid stepping on bare mud as you will sink; step on roots if needed;
  - lift and carry tools and bags of litter – do not drag them as this will damage vegetation.
- xiii. Recreational use of drones is prohibited across Sydney Olympic Park.
  - xiv. Special conditions for works at Northern Water Feature:
    - Gambusia (a predatory fish that eats tadpoles) are common in tidal wetlands and in Lake Belvedere but are absent from most freshwater ponds in the Park including the Northern Water Feature. Stringent biosecurity measures are needed to stop its spread between wetlands. All team members must know the gambusia status of the ponds they are working in and ensure they do not transfer gambusia between ponds on boots, tools, rubbish bags or equipment.
    - Discontinue works if tadpoles are seen.
    - Do not damage frog fencing (black shade cloth). Do not climb frog fencing, lean tools or bollards on it, attach signs to it, or pile materials against it.

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### 3.8 Horse trail operations

The horse trail and exercise area at Wentworth Common and the Brickpit rim is used during the Royal Easter Show. It is situated within wildlife habitats; protocols to protect wildlife and comply with development consent conditions must be implemented during its use.

Environmental risks:

- Trampling and grazing of adjacent grassy frog habitats.
- Disturbance to wildlife.
- Introduction of weeds and pollution of habitat ponds by manure.

Key requirements:

1. SOPA contract manager responsibilities for use of the horse trail by the Royal Agricultural Society for the Royal Easter Show:

- ensure the contents of this standard procedure is included in the Royal Agricultural Society Licence agreement.
- ensure Royal Agricultural Society EMPs identify and address the provisions of this Environmental Procedure, as well as other relevant environmental risks.
- oversight of Royal Agricultural Society compliance.

2. Horse trail development consent conditions (S38/7/97)

- The horse trail and exercise area shall operate only in association with the period of the Royal Easter Show.
- The horse trail and exercise area shall only be used in daylight hours.
- The applicant shall ensure the preparation and implementation of a Waste Management Plan detailing the measures proposed to manage horse solid waste generated during operation of the horse trail and exercise area. The plan shall include details of the collection and disposal of solid waste on a daily basis and plans for its disposal.
- The site shall be fenced to ensure public safety during the operation of the horse trail and exercise area. Fencing shall be of a type that where appropriate allows the movement of frogs between ponds.
- Sediment and runoff controls must be positioned between the frog ponds and the horse trail during operation of the horse trail.

3. Additional requirements

- Horses must be confined to the granite track and the approved mown lawn exercise area only. Adjacent grassland, ponds, garden beds, BBQ areas, playgrounds, and the pathway to Kronos Hill are 'no-go' areas and must be fenced off and signposted prior to horses coming on site.
- Fencing is not to be attached to trees or shrubs. Fences must be maintained in a good state of repair throughout the show period. Horses must not be corralled, exercised, grazed or watered in 'no-go' areas.
- Event staff must be briefed on the location and reason for 'no-go areas', and their responsibilities for policing access restrictions.
- No vehicles, fencing materials, barricades or similar are to be driven, placed or stored on unmown grass during installation or removal of temporary fencing. No piles of fencing materials may be left on site overnight. Fencing consisting of hollow pipes must be capped to prevent entrapment of frogs.
- Fencing must be checked for frogs before being removed. Cut cable ties must be removed (not left on the ground).



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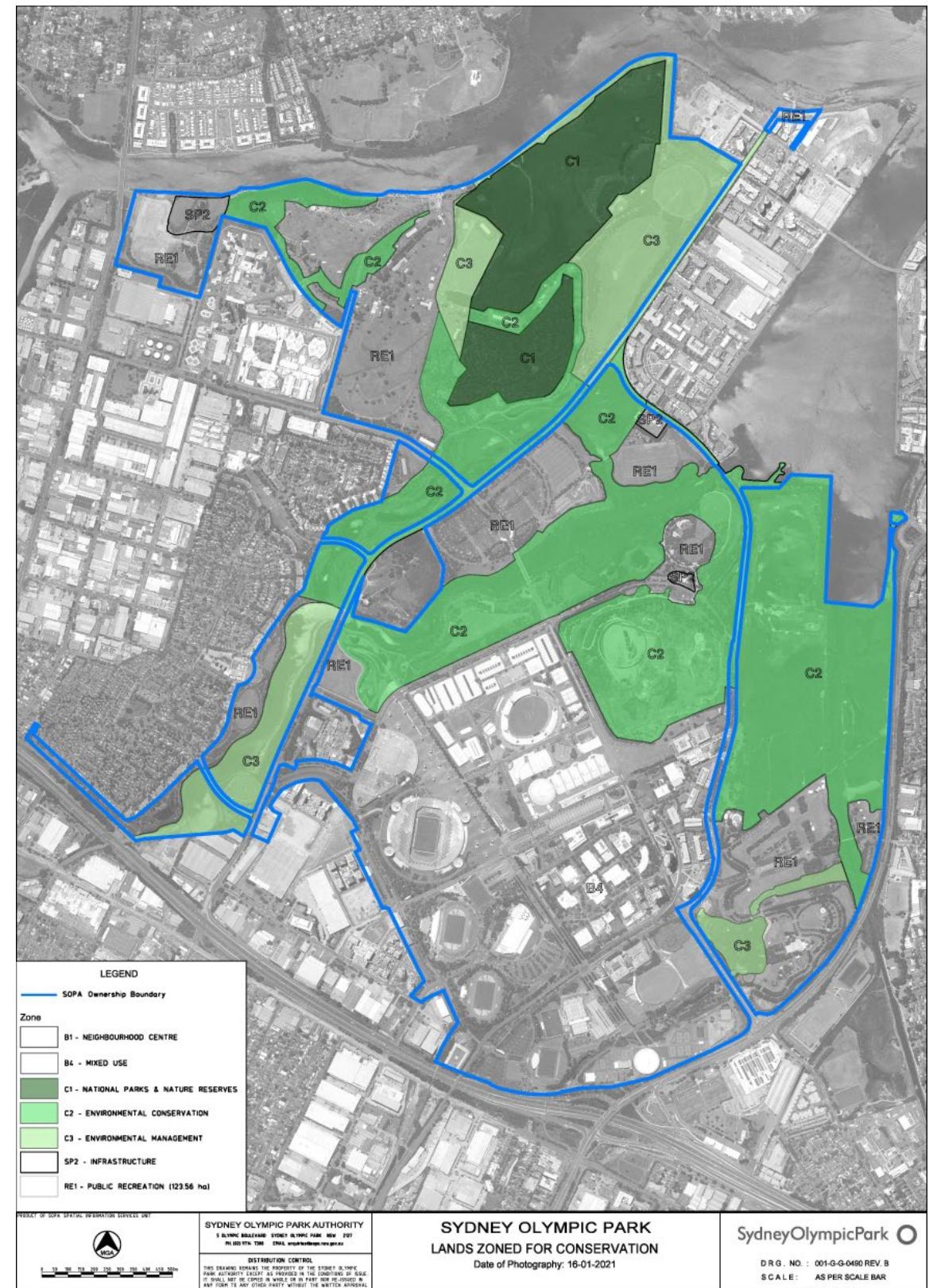
## 4 Soft landscape and habitat management

The following activity-specific procedures apply to soft landscape maintenance and habitat management works within wildlife habitats.

Works in or near habitats must be planned and conducted in a way that:

- protects wildlife and vegetation
- complies with regulatory Permits and Licences issued to SOPA under environmental legislation
- complies with planning laws and consents.

Additional mitigation measures, and/or new regulatory approvals are likely to be required for non-routine maintenance works in estuarine areas and waterways, significant impacts to ponds and wetlands, or large-scale removal of habitat.



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### 4.1 Turf maintenance (mowing and spraying)

Protocols to protect wildlife must be implemented when maintaining turf in the areas shaded red on the map. Special requirements apply to the hatched areas to prevent spread of weed seeds and/or avoid pesticide impacts to adjacent habitats.

Key environmental risks:

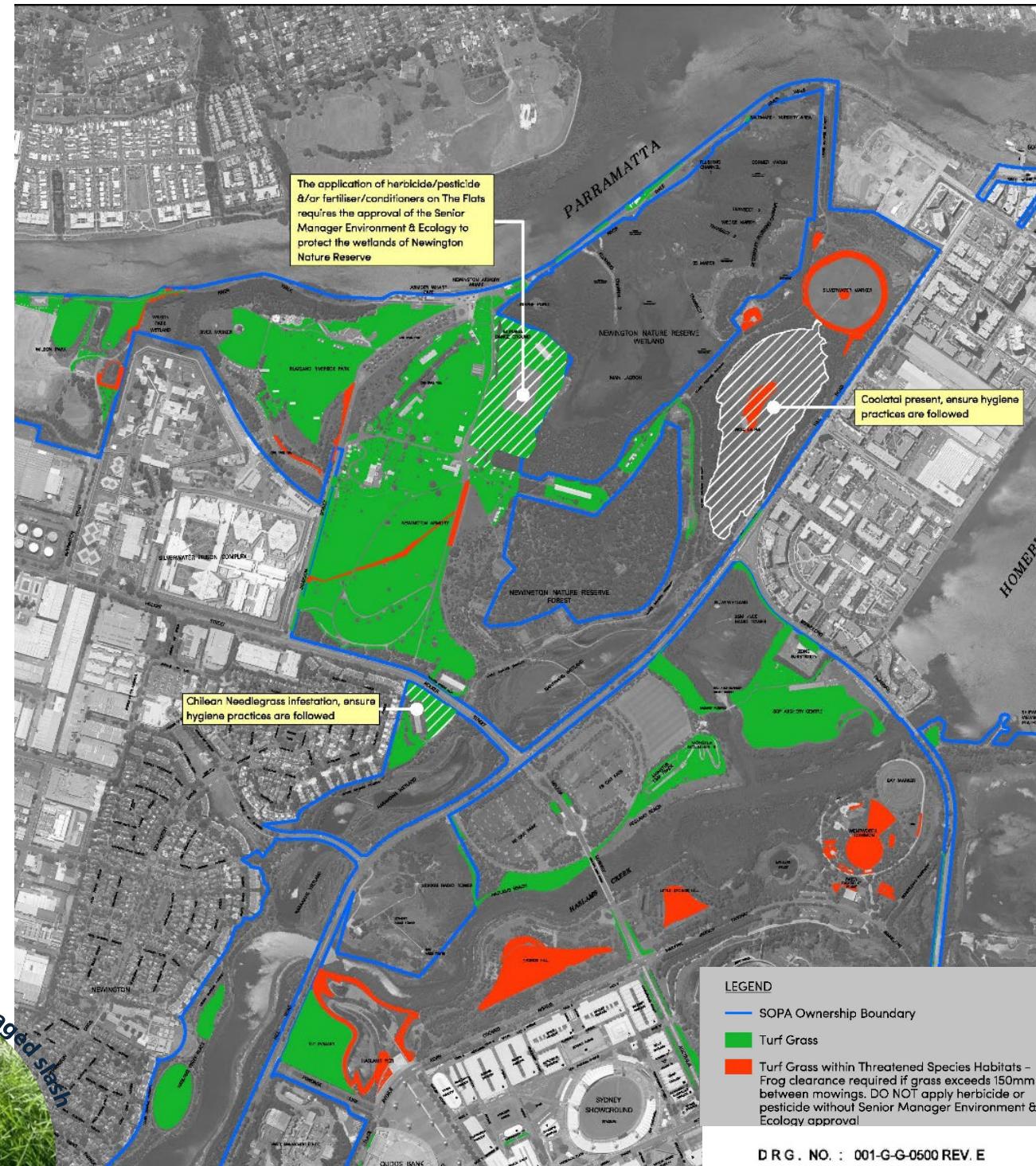
- Spread of turf weeds (particularly Chilean Needle grass and Coolatai).
- Death or injury to Green and Golden Bell Frogs and other wildlife sheltering in overgrown turf.
- Poisoning of Green and Golden Bell Frogs and other wildlife using turf treated with herbicides.
- Pollution of wetlands by pesticide and fertiliser runoff.

Key requirements

- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- Clean mowers to prevent transfer of weed seeds into the park and between

different parts of the park – particularly Chilean Needle Grass and Coolatai grass (see mapped locations).

- Do not mow turf in mapped frog habitat areas (marked in red) if it exceeds 150mm between mowings without SOPA approval. Frog clearance procedures including staged slashing and search for sheltering frogs may be required.
- Do not spray pesticides on turf in the red-shaded areas unless approved by the Environment team. Restrictions apply seasonally during the frog activity season, and to turf over 150mm. Dyes or other additives cannot be used in these areas.
- No pesticide may be applied to turfed lower slopes at the Northern Water Feature (below the path) over the period November to March, to avoid poisoning frogs that hunt on the lawns at night.
- Do not spray pesticides to 'The Flats' at Newington Armory (hatched area on map) unless approved by the Environment Team, due to the proximity to Newington Nature Reserve wetland.



Chilean needle grass seeds can be carried by mowers



Frogs hunt and hide in long grass, and absorb chemicals through their skin



Grass longer than 150mm needs a staged slash

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## 4.2 Sydney Turpentine Ironbark Forest – soft landscape maintenance

Sydney Turpentine Ironbark Forest (STIF) is a critically endangered ecological community that occurs within Newington Nature Reserve, Newington Armory and Narawang Wetland.

The Conservation Strategy for Sydney Turpentine Ironbark Forest (section 2 of the SOPA Biodiversity Management Plan) describes the conservation objectives and actions for this community. Routine maintenance activities include: weed control, maintenance of asset protection zones for built heritage, rail corridor maintenance, maintenance of fire trails and fence lines, thinning of planted vegetation within regeneration areas, seed collection, herbarium collection, and natural and assisted regeneration. Controlled burns are periodically conducted by NPWS.

The STIF community is part of lands listed as Newington Armament Depot and Nature Reserve on the NSW Heritage Register. A site-specific exemption applies to ecological management works.

Vegetation management is undertaken by bush regeneration specialists engaged under a term contract.

### Key requirements:

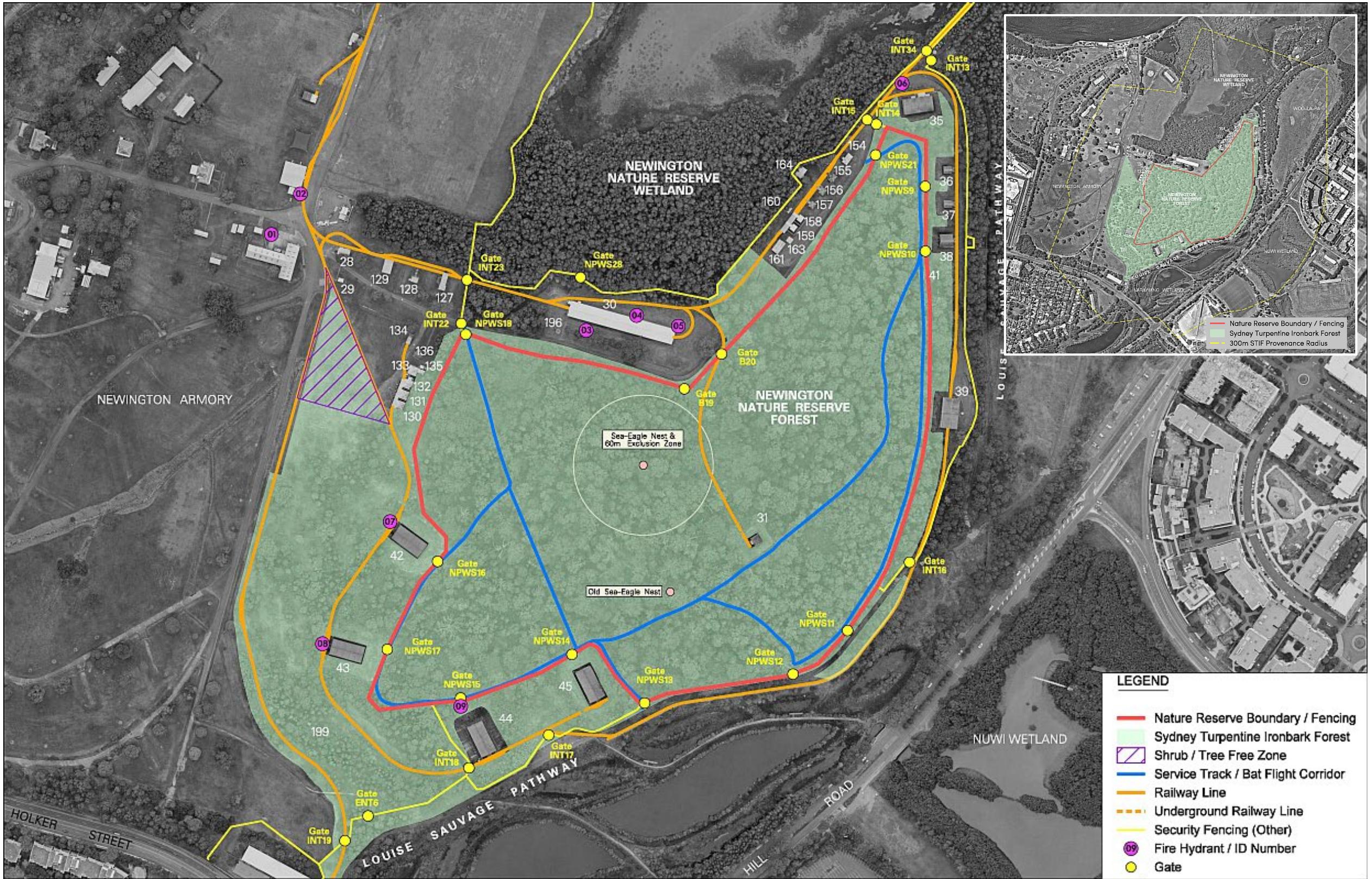
- Vegetation management works must only be undertaken by skilled bush regenerators, qualified arborists or approved SOPA or NPWS staff, in accordance with the precinct Habitat Management Plan..
- Comply with Newington Nature Reserve Access Procedures
- Comply with the 'General Requirements' at section 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'.
- Spray application of herbicide may only be used on isolated weeds growing in hardstand pavements or for primary treatment of exotic grasses >5m from any individually-listed threatened species.

- Review current licence conditions prior to planning or conducting works
- SOPA must provide NPWS with a yearly 'wish list' of target plant species and quantities to be collected from Newington Nature Reserve.
- Implement Florabank guidelines during seed collection.
- To maximise genetic diversity, seed must be collected from multiple plants to bulk, over as wide an area as possible:
  - Collect seed from strong, healthy plants.
  - To allow for natural regeneration, and for fauna that feed upon seeds, no more than 20% of seed is to be collected from any one plant.
  - Seed may not be collected from individually-listed threatened species.
  - Collection of seed and propagules for use outside of Sydney Olympic Park will only be permitted where approved by the NPWS Area Manager.

### Revegetation

- Only plants of local provenance are to be used for revegetation purposes within the STIF community.
- Material, including ROTAP species, collected from the primary Newington Nature Reserve source should where possible, be used for all revegetation purposes within a 300m radius of the reserve, to create a genetic and species buffer.
- SOPA must clearly mark and record the origin of planted material such that this can be used as a secondary source for future plantings away from the Reserve and the 300m radius.
- For plantings outside the 300m radius zone, secondary source material can be used as required.





PROJECT OF SIPA SPATIAL INFORMATION SERVICES UNIT

NOTES

**SYDNEY OLYMPIC PARK**  
**SYDNEY TURPENTINE IRONBARK FOREST**  
**NEWINGTON NATURE RESERVE and NEWINGTON ARMORY**  
**MAP 10**

SYDNEY OLYMPIC PARK AUTHORITY  
 5 OLYMPIC BOULEVARD SYDNEY OLYMPIC PARK NSW 2017  
 PH (02) 9116 1200 FAX (02) 9116 1200  
 DISTRIBUTION CONTROL  
 THIS DRAWING REMAINS THE PROPERTY OF THE SYDNEY OLYMPIC PARK AUTHORITY  
 EXCEPT AS PROVIDED IN THE CONDITIONS OF ISSUE IT SHALL NOT BE COPIED IN  
 WHOLE OR IN PART NOR REPRODUCED IN ANY FORM BY ANY OTHER PARTY WITHOUT  
 THE WRITTEN APPROVAL OF THE SYDNEY OLYMPIC PARK AUTHORITY

**SydneyOlympicPark**

D.R.G. NO. : 004-P-P-0018 REV. W  
 SCALE : AS PER SCALE BAR  
 PLOT DATE: 23/10/2012

### 4.3 Mangrove tree works - pruning or removal

Pruning or removal of mangrove trees typically involves periodic pruning along pathways and bridges to maintain safe passage, pruning of trees blocking infrastructure, and removal of fallen trees blocking pathways.

SOPA holds a regulatory Permit issued under the *NSW Fisheries Management Act 1994* that authorises conditional pruning and removal of mangrove trees. Conditions are incorporated into this procedure.

#### Key environmental risks:

- Breach of environmental legislation or Permit conditions, including removal of mangrove branches contrary to Permit conditions.
- Trampling of saltmarsh and mangrove pneumatophores; compaction of mudflats, damage to vegetation.
- Disturbance to fauna, particularly migratory shorebirds and microbats.
- Changes to bed elevation due to improperly deposited green waste.

#### Need for additional approvals

Permitted routine tasks and asset clearance zones are as described on the following pages.

Approval of Senior Manager Environment & Ecology is required for:

- removal of trees or branches larger than 100mm diameter (350mm circumference), including within bridge or pathway clearance zones;
- removal of trees or branches around assets not listed including addressing non-time-critical safety hazards such as blind spots on pathways ;
- pruning to improve tree health or delay tree fall;
- placement of scaffolding on the mangrove forest floor for bridge works;
- works requiring access to waterways.

What is not allowed under this procedure: Non-routine tree pruning or removal (eg for capital works projects or new works) - a new Permit may be required.

#### Scheduling of works

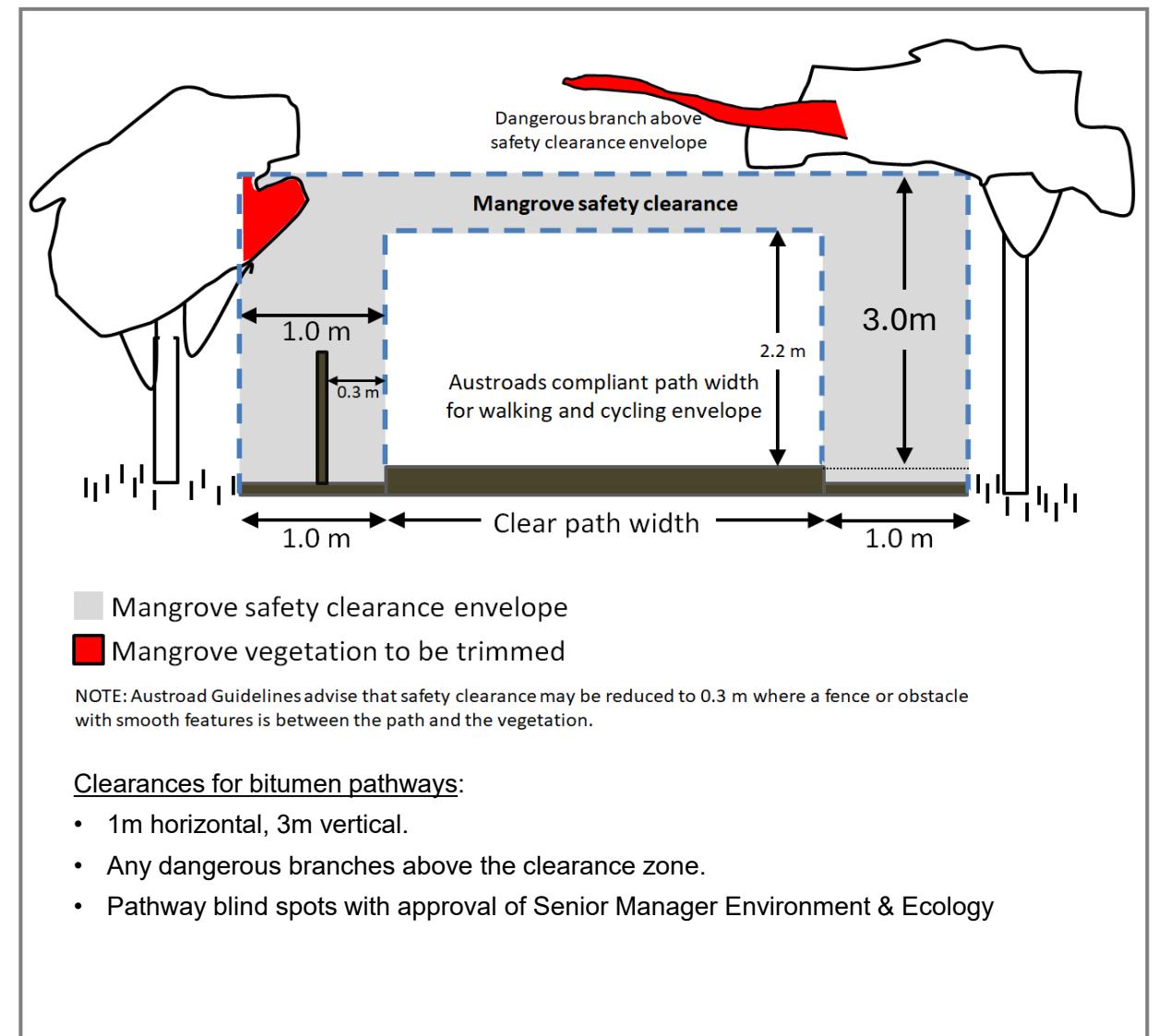
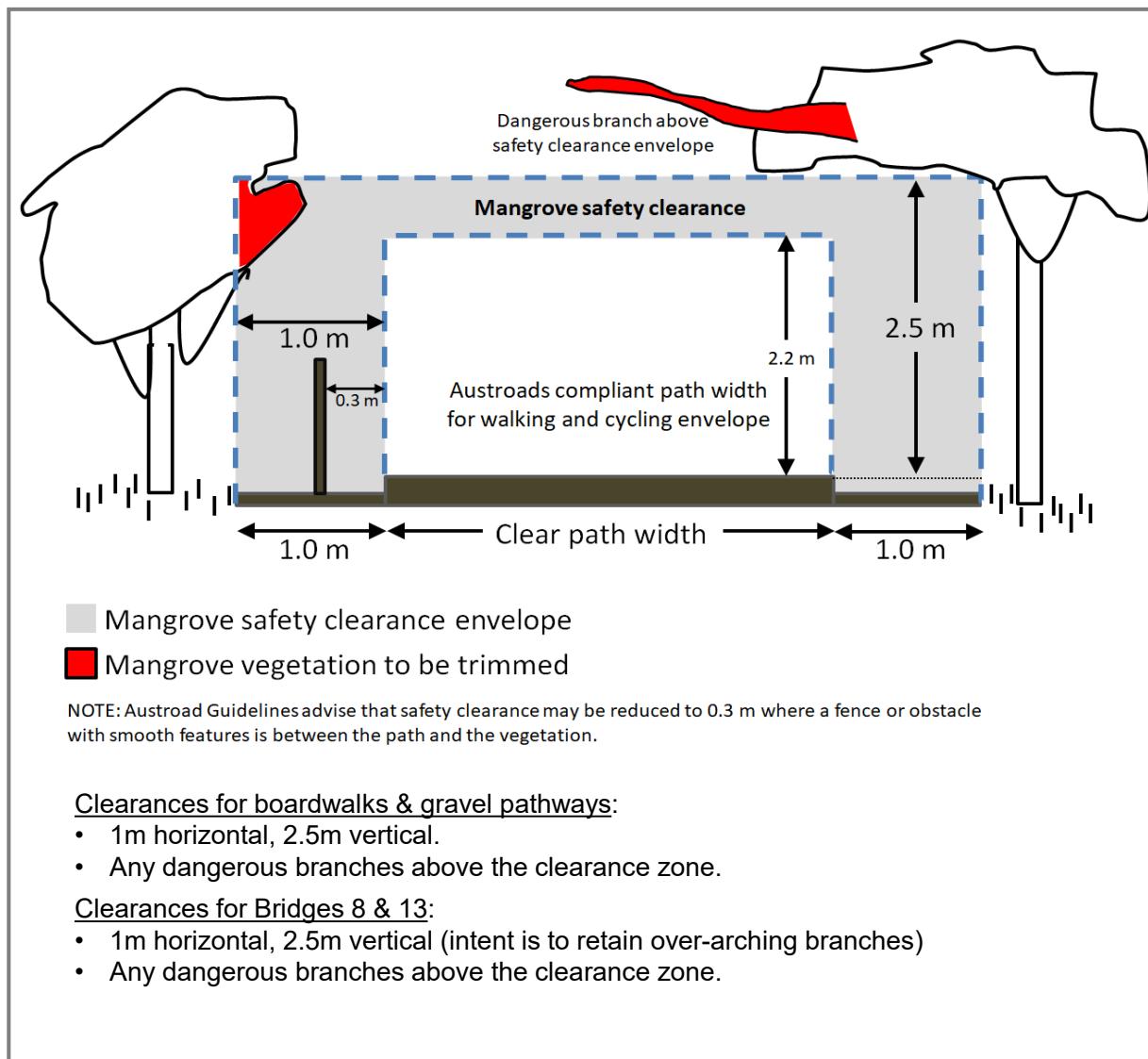
- Avoid scheduling works near the Waterbird Refuge and at Newington Nature Reserve between August and April to minimise disturbance to migratory shorebirds and nesting waterbirds.
- Avoid pruning mangroves at Bicentennial Park bridges 4 & 7 between October and April to avoid disturbance to microbats.

#### Key requirements

- Comply with the ‘General Requirements’ at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of ‘at-risk wildlife’.
- Carry a copy of the regulatory Permit and this Environmental Procedure while conducting works.
- Trees growing in the asset clearance zone may be removed. Unbranched trees where the base is outside the one metre horizontal clearance zone but the bulk of the tree intrudes within the clearance zone may be removed. Leave root systems in place when removing mature trees.
- Works must be conducted by qualified personnel in accordance with Australian Environmental: (AS4373-2007) Pruning of amenity trees. Prune to the minimum extent necessary to achieve maintenance outcomes.
- Hand-tools only (eg chainsaws, handsaws).
- No machinery or vehicles may enter estuarine areas.
- Remove all green waste from site; lift and carry, do not drag on ground.
- Inspect waterways for dead or distressed fish (eg gasping for air) twice daily. Report observations of dead or distressed fish immediately to the SOPA manager and Environment team. Cease all works until further advised.
- Provide details of all mangrove removal and pruning activity using forms on following pages. This information must be reported to Department of Primary Industries as a condition of the regulatory Permit.



## Summary of mangrove tree asset clearance zones at Sydney Olympic Park



Diagrams adapted from: DRAFT CODE OF PRACTICE: Maintenance of safety clearance from infrastructure, by trimming marine vegetation (mangroves) in NSW. Department of Primary Industries March 2022

### Sydney Olympic Park permitted clearances (other structures):

Bridges (other than 8 & 13): 1m horizontal, no overhanging branches.

Viewing areas/interpretation points, Badu Mangroves: minimal pruning to maintain viewing windows of up to 3m wide.

Culvert or pipe opening: only within 5m of opening; roots and debris can also be removed.

Oulton Avenue fence, Bicentennial Park: prune/ remove trees leaning on fence on an as-needs basis.

All other structures: 1m horizontal clearance, excluding fencing along the eastern shore of Homebush Bay near Oulton Avenue.

Others: Remove safety hazards such as fallen trees / branches across assets such as boardwalks, pathways and on gabions or rock walls associated with bridges and flushing channels.

Approval of Senior Manager Environment & Ecology is required for:

- removal of trees or branches larger than 100mm diameter (350mm circumference), including within bridge or pathway clearance zones;
- removal of trees or branches around assets not listed including addressing non-time-critical safety hazards such as blind spots on pathways;
- pruning to improve tree health or delay tree fall;
- placement of scaffolding on the mangrove forest floor for bridge works;
- works requiring access to waterways.

**MANGROVE PRUNING / REMOVAL FORM**

**Part 1 – Checklist**

Item	Applicability
<input type="checkbox"/> Specific approvals received from Environment and Ecology for:	<ul style="list-style-type: none"> <li>tree removal</li> <li>pruning of any branch larger than 100mm diameter (350mm circumference)</li> <li>machinery in waterway / wetland</li> <li>keeping green waste on site</li> <li>new work area without current approval</li> <li>night works</li> </ul>
<input type="checkbox"/> Outside migratory shorebird and nesting shorebird season (August to April).	Waterbird Refuge and Newington Nature Reserve wetland.
<input type="checkbox"/> DPI Fisheries regulatory permit on site at all times during work activity in the permit area.	All works.
<input type="checkbox"/> Work area and no-go zone clearly communicated. <ul style="list-style-type: none"> <li>Only conduct authorised works within permit area – measure distances from pathways and bridges, and branch sizes, to confirm compliance.</li> <li>Identify marine/riparian/endangered vegetation as a no-go zone.</li> </ul>	All works. All marine/riparian/endangered vegetation. <i>Wilsonia backhousei</i> flagged where applicable.
<input type="checkbox"/> Low tide	All works off hardstand
<input type="checkbox"/> SOPA environmental induction received	All staff
<input type="checkbox"/> Check waterway for dead or distressed fish twice daily (fish gasping at water surface, fish crowding in pools or at the creek's banks).	Daily at start and end of works. Report incidents to contract manager and Environment team immediately. Cease works until advised to proceed.
<input type="checkbox"/> Document and report any harm caused to SOPA natural or built asset.	Any vegetation particularly mangroves and saltmarsh; any asset such as signage, fence posts etc, within and outside approved works footprint.
<input type="checkbox"/> Pre work site assessment and photo	All works
<input type="checkbox"/> Post work site assessment and photo	All works

**Part 2 – Daily field record**

Date					
Location					
Contractor					
<b>Designated clearance zone &amp; conditions</b> (tick applicable box)	<input type="checkbox"/> Bitumen pathway: 1m horizontal, 3m vertical <input type="checkbox"/> Boardwalk and gravel pathway: 1m horizontal, 2.5m vertical <input type="checkbox"/> Bridges (8 and 13): 1m horizontal, 2.5m vertical. Retain over-arching branches (Refer to map in Permit) <input type="checkbox"/> Bridges (all except 8 and 13): 1m horizontal, no over-arching branches (Refer to map in Permit) <input type="checkbox"/> Viewing areas / interpretation points, Badu Mangroves: minimal pruning to maintain viewing windows of up to 3m wide <input type="checkbox"/> Within 5m of a culvert or pipe opening (roots and woody debris can also be removed) <input type="checkbox"/> Oulton Avenue fence, Badu Mangroves: prune or remove trees leaning on fence on an as-needs basis <input type="checkbox"/> All other structures (excluding fencing along the eastern shore of Homebush Bay near Oulton Avenue): 1m horizontal clearance				
	<table border="1"> <thead> <tr> <th>Location</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>E.g. Bridge 8</td> <td>E.g. 2</td> </tr> </tbody> </table>	Location	Number	E.g. Bridge 8	E.g. 2
Location	Number				
E.g. Bridge 8	E.g. 2				
<b>Mangrove TREES REMOVED</b>	<table border="1"> <thead> <tr> <th>Location</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Location	Number		
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Location	Number				
<b>Mangrove BRANCHES PRUNED</b>	<table border="1"> <thead> <tr> <th>Location</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Location	Number		
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<table border="1"> <thead> <tr> <th>Location</th> <th>Number over 100mm diameter</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Location	Number over 100mm diameter			
Location	Number over 100mm diameter				

# MANGROVE MANAGEMENT RECORD FORM

## Monthly record *(include in monthly contractor report)*

*Note: SOPA must provide this record to DPI annually as per Permit conditions*

Contractor:

Month and year:

Reason	Location	Mangrove trees removed (number)	Mangrove trees pruned (number)	Mangrove branches over 100mm diameter pruned (number)	Comment
Bitumen pathway access					
Gravel pathway access					
Boardwalk access					
Oulton Avenue fencing protection					
Bridge 8 access	Bridge 8, Badu Mangroves				
Bridge 13 access	Bridge 13, Badu Mangroves				
Other bridges access					
Viewing window clearance (provide locations)					
Culvert/pipe outlets					
Public safety / fallen trees					
Other (provide reason)					
Other (provide reason)					
<b>TOTAL</b>					

#### 4.4 Estuarine wetlands – soft landscape maintenance

Estuarine wetlands include mudflat, saltmarsh, mangrove and Swamp Oak Floodplain Forest (SOFF) communities and intergrades.

Works must be in accordance with the Conservation Strategy for estuarine communities (detailed in Part 2 of the Biodiversity Management Plan). This strategy involves maintaining a balance between the various estuarine communities, including mudflats, through active management of tidal gates and removal of mangrove seedlings and colonising SOFF species from mapped saltmarsh and mudflat conservation areas.

Routine soft landscape management activities include weed control, mangrove and SOFF pruning and removal, mangrove seedling removal, pneumatophore removal/channel clearing, formative pruning to promote tree longevity, propagation and planting. Salt treatments may be applied to wetland edges to control terrestrial weeds.

SOPA holds a Permit issued under the *NSW Fisheries Management Act 1994* which conditionally permits pruning and removal of mangroves – conditions are incorporated into this procedure.

Estuarine wetlands are part of lands listed as Newington Armament Depot and Nature Reserve on the NSW Heritage Register. A site-specific exemption applies to ecological management works.

NPWS approval is required for non-routine works within Newington Nature Reserve.

Key environmental risks:

- Trampling of saltmarsh and mangrove pneumatophores; compaction of mudflats, damage to vegetation.
- Disturbance to fauna, particularly migratory shorebirds and microbats.

- Changes to bed elevation due to deposited green waste.

Key requirements:

- Vegetation management works must only be undertaken by skilled bush regenerators, qualified arborists or approved SOPA or NPWS staff, in accordance with the precinct Habitat Management Plan.
- Comply with Newington Nature Reserve Access Procedures
- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife
- Avoid scheduling works in the Waterbird Refuge and Newington Nature Reserve between August and April to minimise disturbance to migratory shorebirds and nesting waterbirds.
- Schedule works in saltmarsh, mangroves and mudflats during low tide (note tides at Sydney Olympic Park are approximately half an hour behind tides at Fort Denison).
- Carry a copy of the NSW FMA Permit and this Environmental Procedure while conducting works.
- Tree works must be conducted by qualified arborists in accordance with Australian Environmental : (AS4373-2007) Pruning of amenity trees. Prune to the minimum extent necessary to achieve maintenance outcomes.
- Use hand-tools only (eg chainsaws, handsaws). No machinery or vehicles may enter estuarine areas.
- Remove all green waste from the wetlands to avoid changes to bed elevation; greenwaste may be retained on site only in

locations approved by the SOPA Habitat Management Coordinator.

- Lift and carry greenwaste, do not drag on ground.
- Inspect waterways for dead or distressed fish (eg gasping for air) twice daily. Report observations of dead or distressed fish immediately to the SOPA manager and the Environment team. Cease all works until further advised.
- Provide details of all mangrove removal and pruning activity using the form provided.

Need for additional approvals

A new regulatory Permit application will be required for:

- works requiring machinery access to waterways;
- mangrove removal for new or extended tidal drainage channels;
- removal of mangrove pneumatophores or seedlings from unmapped locations;
- removal of snags from waterways other than at culvert openings, booms and drainage channels.

Approval of Senior Manager Environment & Ecology is required for:

- removal of any mangrove tree; removal of mangrove branches larger than 100mm diameter (350mm circumference);
- removal of casuarinas within mapped SOFF that are taller than 3metres;
- formative pruning of mangroves to improve tree health or delay tree fall;
- retention of green waste on site;
- placement of scaffolding on the mangrove forest floor for bridge works.



April 2025

**4.4.1 Mangrove seedling removal**

- Removal of mangrove seedlings is approved at the following locations:
  - mapped saltmarsh / mudflat conservation areas (001-GG-0064). Works are not permitted within migratory shorebird season (September to April);
  - mapped drainage channels;
  - gabions and rock walls associated with bridge and flushing channel support structures;
  - constructed seawalls; mangroves growing in sediment at the base of the seawall must not be disturbed except within 1m of a drainage pipe or culvert outlet;
  - viewing areas / interpretation points at Badu Mangroves to maintain viewing windows of up to 3m wide.
- Remove mangrove seedlings from approved areas by hand when <0.5m in height (Permit conditions allow removal of saplings to 1.5m in height only to enable removal of 'missed' plants),
- Use of herbicide is not permitted.
- Minimise soil disturbance when pulling mangrove seedlings. Cut rather than pull:
  - any mangroves in UXO areas of Newington Nature Reserve;
  - any mangroves within one metre of *Wilsonia backhousei*;
  - mangroves greater than 0.5m tall or past the 12-leaf stage.

**4.4.2 Mangrove pneumatophore pruning/removal**

- Removal of mangrove pneumatophores is approved from mapped locations

(001-G-G-0344G), including:

- mapped drainage channels;
- Within 5m of a culvert or pipe opening (roots and woody debris can also be removed);
- Only hand tools (including brush cutters) may be used.

**4.4.3 Pruning or removing mature mangrove trees**

- See Environmental Procedure 4.3 for routine works involving the pruning or removal of mangroves for pathway, boardwalk and infrastructure maintenance.
- With approval of Senior Manager Environment & Ecology, individual trees may be pruned or removed to:
  - improve tree health or longevity (eg leaning trees along the eroding banks of Haslams Creek at risk of tree-fall). Work must be performed by a qualified arborist
  - manage an urgent public safety risk or management issue (eg fallen trees and branches over pathways and infrastructure; fallen trees blocking water flow).

**4.4.4 Pruning or removing SOFF**

- Casuarinas and Myoporum within mapped saltmarsh/mudflat conservation areas may be removed by cutting with hand tools when <1.5m in height (missed plants can be removed up to 3m in height).
- SOFF along pathways, or blocking access to fences, culverts, leachate or other park infrastructure may be pruned/cut as required to maintain maintenance clearances. This includes

addressing 'clump creep' of casuarinas.

- Pathways service roads are to be maintained with a 1m horizontal and 3m vertical clearance.
- Culvert or pipe openings: maintain clearance within 5m of outlets; roots and debris can also be removed.
- All other structures: 1m horizontal clearance.
- Herbicide must not be applied to cut casuarina suckers to prevent the death of adult trees.

**4.4.5 Works in coastal saltmarsh**

Approved works include routine weed sweeps, mangrove seedling removal, and collection of seed and cuttings

- Ensure team members are fully aware of the locations of *Wilsonia backhousei* at the worksite, and minimise trampling. Spray application of herbicide may not be used within 5m of this species.

**4.4.6 Saltmarsh seed collection:**

- Ensure any collection of saltmarsh seed / cuttings for reuse on site is conducted in accordance with Florabank guidelines.
- Seed is to be collected from multiple plants, over as wide an area as possible, and from strong, healthy plants. No more than 20% of seed may be collected from any one plant.
- Individual saltmarsh plants of any species may be relocated to suitable sites within the Park as part of a salvage translocation program, where works have undergone an environmental assessment process.



**MANGROVE MANAGEMENT RECORD FORM – SOFT LANDSCAPE MAINTENANCE**

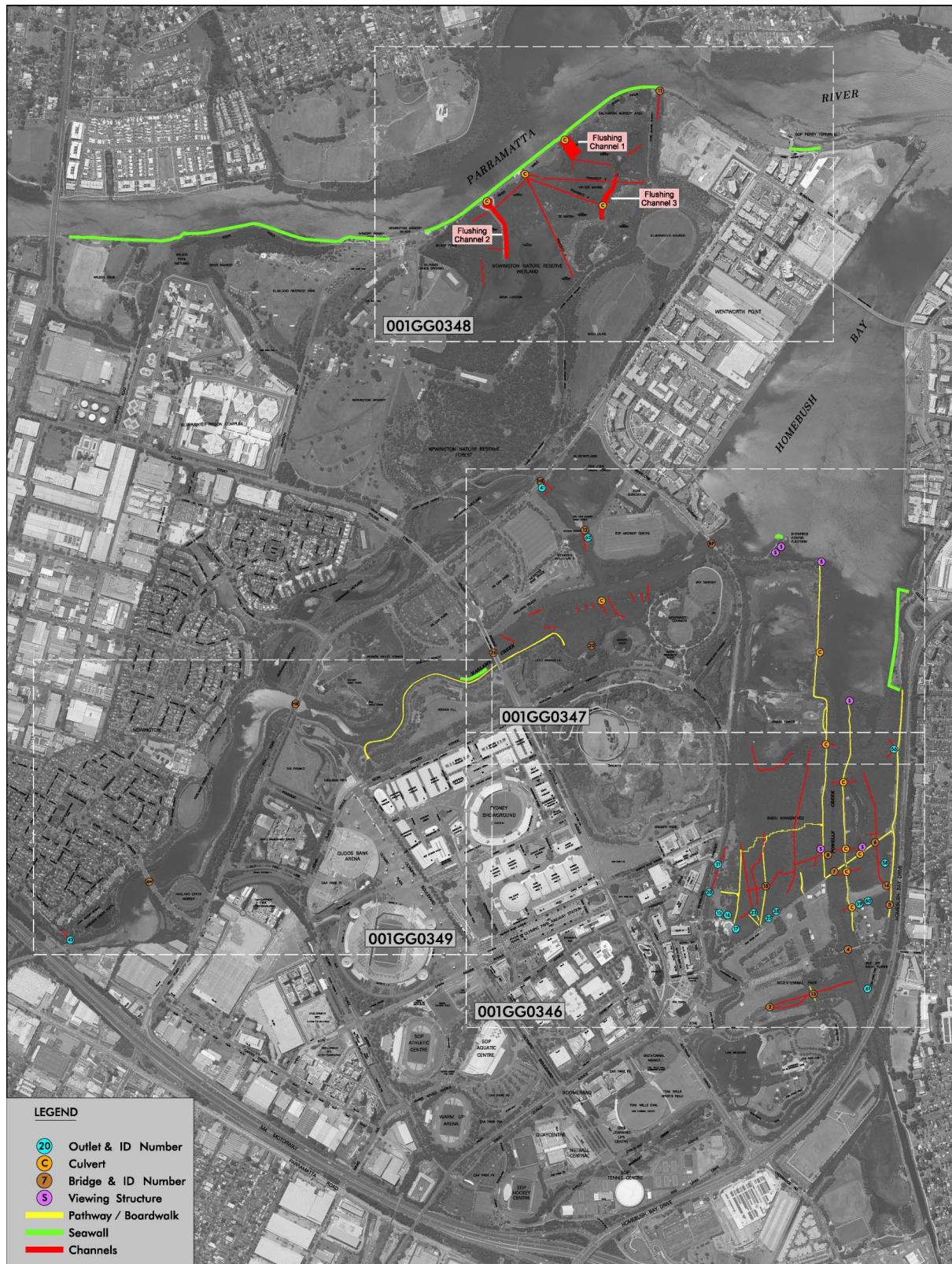
**Monthly record (include in monthly contractor report)**

*Note: SOPA must provide this record to DPI annually as per Permit conditions*

Contractor:

Month and year:

Reason	Location	Seedlings removed (number)	Trees pruned (number)	Channels cleared (length)	Other (number)	Comment
Mangrove seedling removal						
Mangrove seedling removal						
Mangrove seedling removal						
Drainage channel clearing						
Drainage channel clearing						
Drainage channel clearing						
Mangrove tree pruning						
Mangrove tree removal						
Public safety / fallen trees						
Other (provide reason)						
Other (provide reason)						
<b>TOTAL</b>						



	SYDNEY OLYMPIC PARK AUTHORITY 5 OLYMPIC BOLLIVARD SYDNEY OLYMPIC PARK NSW 2127 PH: 002 9776 7388 EMAIL: enquiries@sydneyolympicpark.gov.au	<b>SYDNEY OLYMPIC PARK</b> <b>MANGROVE MANAGEMENT PLAN</b>	
	DISTRIBUTION CONTROL THIS DRAWING REMAINS THE PROPERTY OF THE SYDNEY OLYMPIC PARK AUTHORITY EXCEPT AS PROVIDED IN THE CONDITIONS OF ISSUE. IT SHALL NOT BE COPIED IN WHOLE OR IN PART NOR RE-ISSUED IN ANY FORM TO ANY OTHER PARTY WITHOUT THE WRITTEN APPROVAL OF THE SYDNEY OLYMPIC PARK AUTHORITY.	D.R.G. NO. : 001-G-G-0344 REV. G SCALE : AS PER SCALE BAR PLOT DATE: 14/05/2014	Sheet 1 of 5 Sheets

Mangrove map overview  
001-GG-0344



	SYDNEY OLYMPIC PARK AUTHORITY 5 OLYMPIC BOLLIVARD SYDNEY OLYMPIC PARK NSW 2127 PH: 002 9776 7388 EMAIL: enquiries@sydneyolympicpark.gov.au	<b>SYDNEY OLYMPIC PARK</b> <b>COASTAL SALTMARSH and MANGROVE</b> <b>CONSERVATION AREAS</b> <b>MAP 12</b>	
	DISTRIBUTION CONTROL THIS DRAWING REMAINS THE PROPERTY OF THE SYDNEY OLYMPIC PARK AUTHORITY EXCEPT AS PROVIDED IN THE CONDITIONS OF ISSUE. IT SHALL NOT BE COPIED IN WHOLE OR IN PART NOR RE-ISSUED IN ANY FORM TO ANY OTHER PARTY WITHOUT THE WRITTEN APPROVAL OF THE SYDNEY OLYMPIC PARK AUTHORITY.	D.R.G. NO. : 001-G-G-0064 REV. L SCALE : AS PER SCALE BAR PLOT DATE: 15/05/2014	The purpose of this drawing is to identify 'saltmarsh/mudflat conservation zones', where removal of mangrove seedlings for the purpose of saltmarsh and mudflat conservation is permitted.  Care must be taken when using this drawing for other purposes. The drawing does not accurately show all locations of mangrove and saltmarsh communities within Sydney Olympic Park, for example, areas mapped as 'mangrove conservation zone' include large tracts of saltmarsh and open water.

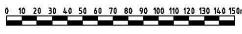
Saltmarsh and mudflat conservation areas  
001-GG-0064



**LEGEND**

- 20 Outlet & ID Number
- C Culvert
- 7 Bridge & ID Number
- S Viewing Structure
- Pathway / Boardwalk
- Seawall
- Channels

PRODUCT OF SOPA SPATIAL INFORMATION SERVICES UNIT

**NOTES**

**SYDNEY OLYMPIC PARK  
MANGROVE MANAGEMENT PLAN**

Sheet 2 of 5 Sheets

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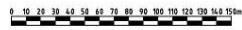
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**SydneyOlympicPark** 

DRG. NO. : 001-G-0-0346 REV. C  
 SCALE : AS PER SCALE BAR  
PLOT DATE: 4/05/2022



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**SYDNEY OLYMPIC PARK  
MANGROVE MANAGEMENT PLAN**

Sheet 4 of 5 Sheets

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**SydneyOlympicPark** 

DRG. NO. : 001-G-0-0348 REV. C  
 SCALE : AS PER SCALE BAR  
 PLOT DATE: 4/05/2022

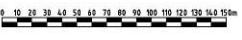
Structures within Newington Nature Reserve  
001-GG-0348



**LEGEND**

- 20 Outlet & ID Number
- C Culvert
- 7 Bridge & ID Number
- S Viewing Structure
- Pathway / Boardwalk
- Seawall
- Channels

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**NOTES**

**SYDNEY OLYMPIC PARK  
MANGROVE MANAGEMENT PLAN**

Sheet 3 of 5 Sheets

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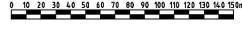
**SydneyOlympicPark** 

D R G . NO . : 001-G-G-0347 REV. D  
 S C A L E : AS PER SCALE BAR  
 PLOT DATE: 4/5/2022

Structures within Haslams Creek, Nuwi Wetland and Waterbird Refuge  
001-G-G-0347



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**SYDNEY OLYMPIC PARK  
MANGROVE MANAGEMENT PLAN**

Sheet 5 of 5 Sheets

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**SydneyOlympicPark**

DRG. NO. : 001-G-G-0349 REV. C  
SCALE : AS PER SCALE BAR  
PLOT DATE: 4/25/2022

Structures – Haslams Creek Flats and Kronos Hill  
001-G-G-0349

## 4.5 Frog habitat – soft landscape maintenance

Approximately 200 hectares of Sydney Olympic Park is habitat for the endangered Green and Golden Bell Frog (Map 001GG0240) and is managed for frog conservation objectives.

Much of this land is within publicly-accessible parkland areas where maintaining landscape presentation standards is also a key objective. To protect the frog and its habitat, protocols apply to routine vegetation management activities such as weeding, slashing, planting, mulching, pruning, macrophyte removal, renewal disturbance, removal of large weed stands.

### Environmental risks:

- Loss or damage of habitat (including weeds).
- Death or injury to Green and Golden Bell Frogs.
- Introduction or spread of *Gambusia holbrooki* and diseases such as Chytrid.
- Disturbance, death or injury to nesting birds, lizards and other fauna.



### Habitat management objectives

- Manage constructed habitat ponds and/or design new ponds to achieve:
  - retention of water for a minimum of 8 weeks;
  - a range of water depths including a minimum depth of 75 cm in part of the waterbody;
  - be unshaded between 10am and 4pm;
  - macrophytes covering 40% - 70% of the waterbody when the pond is full, with perimeter macrophytes being at least 1.5 metres wide where pond design permits;
  - contain shelter habitat such as rock piles;
  - free of *Gambusia*;
  - a perimeter zone of tall dense grasses (over 30cm high) extending a nominal 5 metres from the pond edge, free of invasive exotic grasses;
  - Typha and Phragmites free (except as detailed in Habitat Management plans for ponds A1, H4, VG2, Eastern Pond);
  - linkage by movement corridors or foraging areas to other ponds. Corridors to be minimum 10m wide and dominated by tall dense native grasses (over 30cm high) covering at least 70% of the nominated area.
- Ponds are to be maintained free of Typha and Phragmites (except as detailed in Habitat Management Plans for ponds A1, H4, VG2, Eastern Pond).
- Manage frog pond nodes (clusters of tubs or clusters of constructed ponds) in accordance with Procedure 4.6.
- Maintain a mosaic of habitat stages within precincts, by implementing a periodic renewal disturbance regime (including manipulation of pond wetting

within 10m of the Brickpit edge.

- Frog fences, fish fences and bunds retained in a good state of repair.
- Retain and add rock piles and log piles near ponds and scattered throughout precincts.

### Routine vegetation management includes:

Weed control, slashing, planting, mulching, pruning, macrophyte removal, pond renewal disturbance, maintenance of pathways.

### Routine hydrological management of constructed ponds and tubs includes:

- Topping up water levels during the frog breeding season to maintain suitability as breeding ponds
- Draining and drying ponds to promote macrophyte health and to facilitate works to clear choked ponds
- Cyclic draining of ponds within Narawang Wetland for *Gambusia* control
- Liming of drained Narawang Wetland ponds to manage pH
- Salting of selected ponds and tubs for chytrid management

### Terrestrial habitat - key requirements:

- Vegetation management works must only be undertaken by skilled bush regenerators, qualified arborists or approved SOPA staff, in accordance with the precinct Habitat Management Plan.
- Comply with Brickpit Access Procedures
- Comply with the 'General Requirements' at Procedure 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of 'at-risk wildlife'
- Ecological input to scheduling and scale of works is required in frog habitat areas. Planning must account for seasonal

small, before they set seed or develop into habitat for frogs, birds or lizards, and to minimise disturbance due to weed control.

- Weed primarily using hand tools. Tall annual weeds may be slashed to 200mm high, as required to prevent seeding.
- Check tadpole status of ponds with the Parklands Ecologist before entering waterbodies; do not enter ponds where tadpoles are present. Minimise sediment disturbance during works. Take care to not pierce or otherwise damage pond liners.
- Spray application of herbicide is not permitted in frog habitat unless approved on a case by case basis by the SOPA Contract Manager.
- Extensive removal of reeds must generally be conducted when ponds are dry.
- Slashing of grasses and groundcovers (including weeds) to less than 200mm high is classified as 'works' and Environmental Procedure 2 applies.
- Remove greenwaste, tools, materials and equipment from site daily to prevent wildlife sheltering amongst them. Where greenwaste is approved to be retained on site - pile harvested vegetation on sparsely vegetated ground at least 2 metres from ponds, in locations where it will not fall or blow into a pond or look unsightly when viewed from public pathways. Do not pile greenwaste on rock piles.

#### 4.5 Frog habitat – soft landscape maintenance (continued)

##### Routine activities

Routine vegetation management of constructed and naturally-formed ponds, wetlands and tubs includes:

- Hand weeding, thinning of macrophytes; addition of macrophytes,
- Removal of dense algae mats
- Pond resetting through removal of macrophytes

Routine hydrological management of constructed ponds and tubs includes:

- Topping up water levels during the frog breeding season to maintain suitability as breeding ponds
- Draining and drying ponds to promote macrophyte health and to facilitate works to clear choked ponds
- Cyclic draining of ponds within Narawang Wetland for gambusia control
- Liming of drained Narawang Wetland ponds to manage pH
- Salting of selected ponds and tubs for chytrid management

Routine management of terrestrial areas includes:

- Hand weeding

##### Key requirements – all areas:

- Vegetation management works must only be undertaken by skilled bush

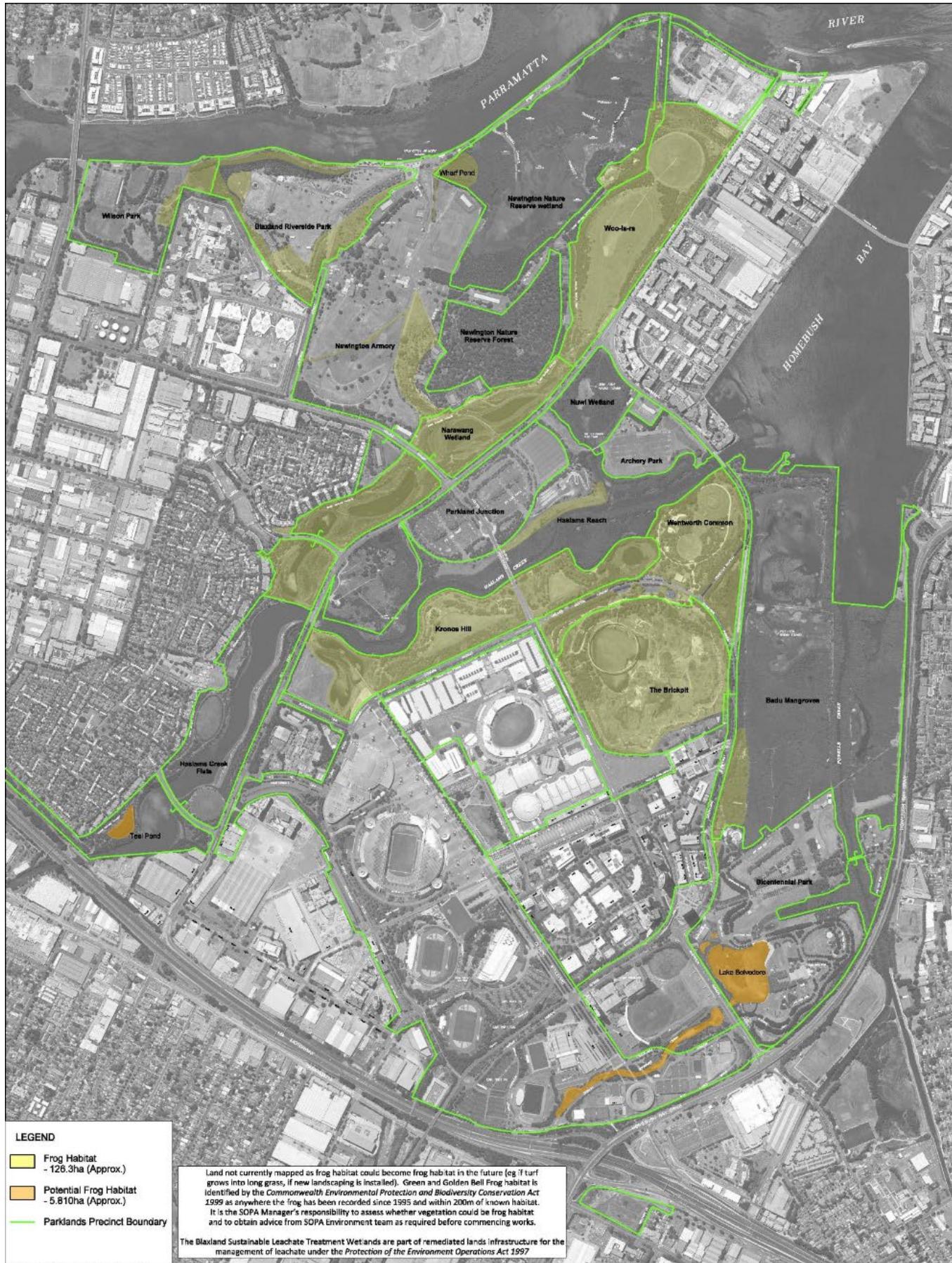
regenerators, qualified arborists or approved SOPA staff, in accordance with the precinct Habitat Management Plan.

- Comply with Brickpit Access Procedures
- Comply with the ‘General Requirements’ at section 1 relating to biosecurity, wildlife protection, herbicide and pesticide use, parklands road rules, and relocation of ‘at-risk wildlife
- Ecological input to scheduling and scale of works is required in frog habitat areas. Planning must account for seasonal frog/bird activity and breeding patterns, and availability of alternate habitat.
- Spray application of herbicide is not permitted in frog habitat unless approved on a case by case basis by the SOPA Contract Manager.
- Slashing of grasses and groundcovers (including weeds) to less than 200mm high is classified as ‘works’ and Environmental Procedure 2 applies.
- Remove greenwaste, tools, materials and equipment from site daily to prevent wildlife sheltering amongst them. Where greenwaste is approved to be retained on site - pile harvested vegetation on sparsely vegetated ground at least 2 metres from ponds, in locations where it will not fall or blow into a pond or look unsightly when viewed from public pathways. Do not pile greenwaste on rock piles.
- Weed primarily using hand tools. Tall

annual weeds may be slashed to 200mm high, as required to prevent seeding.

##### Ponds and wetlands – additional requirements:

- Check tadpole status of ponds with the Parklands Ecologist before entering waterbodies; do not enter ponds where tadpoles are present. Minimise sediment disturbance during works. Take care to not pierce or otherwise damage pond liners.
- Extensive removal of reeds must generally be conducted when ponds are dry.
- Manage selected salted ponds to obtain a salinity rate of 2-3 ppt. Add required salt to ponds during March and maintain salinity levels through to September.
- Monitor drained Narawang Wetlands ponds as they are refilled, for pH. If pH levels are below 5, apply lime at a rate of 1kg/5sqm. Continue weekly monitoring, and reapply lime until pH levels are between 6-8



Green and Golden Bell Frog

Sydney Olympic Park Frog Habitats

April 2025

## 4.6 Frog pond node management

Frog pond nodes have been constructed within the Brickpit, Kronos Hill and Narawang Wetland precincts of Sydney Olympic Park, with additional nodes planned for installation over the next 18 months. These nodes comprise clusters of breeding ponds installed within the broader frog habitat precincts that are able to be highly managed to control threats to the Green and Golden Bell Frog. They provide for wild breeding as well as for release of captive-bred frogs and translocation of wild-bred tadpoles from elsewhere in the Park as part of an approved program (subject to further regulatory approval).

Nodes have the following common features:

- closely-clustered groups of ponds, free of gambusia and connected to the Park's irrigation system for refilling
- emergent/submerged vegetation and stakes/stick for basking and emerging metamorphs
- tubs and tanks are above-ground and so inaccessible to ground-dwelling frogs
- netting to address avian predation; some fully netted to also address fox and cat predation
- nearby gabions / rock piles / log piles to provide sheltering habitat
- some ponds in each node are salted to reduce susceptibility to chytrid fungus
- situated within a broader frog habitat landscape containing ponds and grasslands and wild GGBF populations.

### Description of nodes

- Brickpit C4 enclosure – cluster of 6 raised galvanised metal tanks 2400mm diameter and 640mm deep with a capacity of 2,895L. Gabions set within the pond cluster provide sheltering habitat. All tanks are fitted with a float valve for automated water level

management. Tanks have a bung and can be drained as required. The node is fully netted with enclosure netting of 50-70mm netting, that enables free movement of frogs to and from the enclosure but prevents entry of cats, foxes and birds.

- Narawang Wetland North – cluster of 6 raised plastic cattle troughs, measuring 2120mm diameter x 625mm depth with a capacity of 2000L. The node is netted to control predation by birds; there is potential for addition of enclosure netting in the future. Nearby log and rock piles provide sheltering habitat, and tubs contain macrophytes. All tanks are fitted with a float valve for automated water level management. Tanks have a bung and can be drained as required.
- Narawang Wetland South – cluster of 6 raised plastic cattle troughs, measuring 2120mm diameter x 625mm depth with a capacity of 2000L. The node is netted to control predation by birds; there is potential for addition of enclosure netting in the future. Nearby log and rock piles provide sheltering habitat, and tubs contain macrophytes. All tanks are fitted with a float valve for automated water level management. Tanks have a bung and can be drained as required.
- Kronos Hill O Ponds enclosure – cluster of 5 shallow lined rectangular ponds. Ponds are connected to the WRAMS recycled water system and water management is manually operated. The node is fully netted with netting sized 50-70mm that enables free movement of frogs to and from the enclosure but prevents entry of cats, foxes and birds.



Brickpit C4 enclosure



Narawang Wetland South node



Kronos Hill O Pond enclosure

April 2025

**Key node management objectives:**

Each node is managed to provide GGBF breeding sites / tadpole release sites that can be individually managed for predator control, water level, water quality and vegetation coverage, and where a portion of the ponds can be salted for 'self-medication' of chytrid infection.

**Routine node management actions:**

The management regime for each node and for individual ponds within the nodes will be developed at the start of the frog activity season each year, and will account for whether the program will include an approved tadpole release or translocation program. Management activities will include:

- Check netting integrity at start of the frog activity season each year (August/September) and then every visit thereafter.
- Thin macrophytes prior to commencement of the frog activity season to achieve a coverage of 20-50%
- Consider removal of floating aquatic plants (duckweed, azolla) and algae mats on a case-by case basis with consideration of water temperature, tadpole entrapment and decomposition impacts
- Manage terrestrial vegetation within the node footprint as primarily bare ground or low vegetation to provide for maintenance access. Outside the node footprint, terrestrial vegetation will be managed to provide patches of tall grass/sedges for shelter but prevent any shading of the ponds.
- Complete any planned macrophyte or terrestrial vegetation works within the nodes by September each year.

- 1-2 ponds within each cluster will be salted to increase salinity to 2-3ppt and reduce susceptibility to lethal disease caused by chytrid fungus.

- Water level will be actively maintained throughout the frog activity season

Preparation of ponds for the breeding season

Ponds within the nodes will be prepared to receive GGBF tadpoles (wild-bred or captive release) in September each year, ahead of the GGBF breeding season. Predators and non-target species of tadpoles/frogs will be removed. Activities may include:

- Dipnetting in each tub to remove tadpoles of non-target species (if any). Tadpoles will be released in the nearest suitable waterbody.
- Draining and drying ponds to remove invertebrate predators. During this process, outlets will be monitored for any remaining tadpoles that require relocation.
- Placement of netting over individual tubs to exclude non-target frog species and/or lizards.

Inspection and management of ponds containing GGBF tadpoles

- Inspect ponds at least twice-weekly, checking netting integrity, water level, coverage of algae and floating plants, tadpole numbers and development, and feeding behaviour.
- Monitor water quality weekly, recording salinity, pH, conductivity, total dissolved solids and temperature.
- Monitor weather forecasts to detect predicted extreme weather events such as heatwaves. Should water temperature approach 27 degrees in ponds containing

tadpoles, shade cloth and/or aerators will be installed if not already present.

- Assess ponds for food availability. Many ponds have existing algae and vegetation and will host a clutch of 400 tadpoles without supplementary feeding. If supplementary feeding is considered necessary, foods such as sliced zucchini or tropical fish/trout pellets may be provided. Food consumption is to be closely monitored and any uneaten zucchini removed within 24 hours. If fish pellets are not consumed within 24 hours, consider reducing the volume provided or ceasing to provide food.

April 2025

## 4.7 Wildlife release by wildlife carers

Release of rehabilitated wildlife by wildlife carers must be managed to ensure that the wild population and natural environment are not negatively impacted.

### Environmental risks:

- Spread of pests and disease.
- Displacement of existing wildlife at release site; disturbance to existing species balances.
- Development of unwanted populations of released species eg snakes, possums, waterbirds.

### Key requirements:

- Release of fauna to Sydney Olympic Park is to comply with the [‘Code of practice for injured sick and orphaned fauna NSW’](#)
- Release of fauna to the habitats of Sydney Olympic Park is permitted only with written approval of SOPA Environment & Ecology staff, and at a release site approved by the Authority.
- Release of frogs or tadpoles will not generally be approved because of potential risk of disease introduction; release of snakes will not generally be approved because of potential conflicts with park visitor use.
- Only native fauna species indigenous to the area will be considered for release.
- Fauna release will not be approved at Newington Nature Reserve or Newington Armory (unless the animal was taken into care from this site).

- Factors considered in determining an approval for release include:
  - Origin of the animals – generally only wildlife found at the Park or within 5km of it will be accepted (a copy of the call sheet location record must be provided).
  - Species, number and age of fauna.
  - Availability of suitable habitat.
  - Potential conflicts with existing wildlife.
  - Reason fauna were taken into care; time in care.
  - Veterinarian assessment of suitability for release and ability to survive independently in the wild.
  - Potential for disease introduction.
- Fauna approved for release will be banded / tagged, where requested by SOPA.
- SOPA will record details of all fauna released, their release site, carer name and carer’s Licence number (date recorded in Birdata).
- A SOPA staff member must be present when wildlife is released.

