

# Bushfire Assessment

In relation to

**Reptile & Amphibian Conservation Centre**

**Taronga Zoo**

Prepared for:

**Taronga Conservation Society Australia**



July 2021

Project: 21156

© This document is copyright.

e: [simon@bushfireconsultants.com.au](mailto:simon@bushfireconsultants.com.au)

Mail: PO Box 34 Forster NSW 2428

Office: Level 1, Building Q, Head Street Car Park  
Head Street, Forster NSW 2428

Phone (02) 6555 5522

**ABAC Group Pty Ltd t/as Australian Bushfire Assessment Consultants**

ABN: 75630374060

Telephone: 02 6555 5522

PO Box 34 Forster NSW 2428

***Document Details***

Title: Bushfire Assessment

File No. 21156

Date: July 2021

Prepared for: Taronga Conservation Society Australia

***Authors***

Prepared by:

Simon Carroll

*Graduate Diploma in Design for Bushfire Prone Areas*

*Graduate Diploma in Building Fire Safety & Risk Engineering*

*Bushfire Planning and Design Accredited Practitioner: Level 3 – NSW*

*Accreditation Number BPAD9326*

© This document is copyright.

It is a breach of copyright for this document to be used by any persons/entities other than those for whom this document was prepared. Other than for the purpose for which this document has been prepared and subject to conditions prescribed under the Copyright Act no part of this document may in any form nor by any means be reproduced or stored in a retrieval system or transmitted without the prior written permission of ABAC Group Pty Ltd (t/as ABAC Australian Bushfire Assessment Consultants).

## Table of Contents

1. INTRODUCTION .....	1
2. THE PROPOSAL .....	2
3. THE SITE .....	4
4. <i>PLANNING FOR BUSH FIRE PROTECTION 2019</i> .....	7
5. ASSESSMENT OF VEGETATION AND SLOPE .....	8
6. OBJECTIVES OF <i>PLANNING FOR BUSH FIRE PROTECTION 2019</i> .....	9
7. COMMENT ON BUSHFIRE EVACUATION PROCEDURES .....	11
8. CONCLUSION .....	15
9. RECOMMENDATIONS .....	16
REFERENCES .....	16

## 1. Introduction

---

ABAC Australian Bushfire Assessment Consultants have been commissioned by Taronga Conservation Society Australia (TCSA) to carry out a bushfire assessment in relation to the proposed Reptile and Amphibian Conservation Centre (RACC) at Taronga Zoo.

Secretary's Environmental Assessment Requirements (SEARs) were issued for the project and Item 18 of the Key Issues listed in the SEARs is entitled "Bushfire & Safety", with the requirements listed as:

- *If the proposed development is on or near bush fire prone land, the EIS must include a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with Planning for Bush Fire Protection.*
- *Prepare an assessment on the emergency planning and management measures required to facilitate an emergency services response and the other obligations imposed by clause 43 of the Work Health and Safety Regulation 2000.*

The scope of this bushfire assessment is limited to the consideration of the proposed RACC only.

In relation to the second dot point of item 18 of the SEARs above, the consideration of matters such as obligations imposed by the *Work Health and Safety Regulation 2000* (WHS Regulation) is outside the scope of the bushfire assessment and is a matter for other disciplines.

Clause 43 (*Duty to prepare, maintain and implement emergency plan*) of the WHS Regulation relates to workplace health and safety and does not relate to bushfire assessment considerations. Clause 43 sets out various obligations on a person (or organisation) conducting a business or undertaking at a workplace to ensure that an emergency plan is prepared for the workplace. Clause 43 also sets out maximum penalties if the obligations are not met.

The following matters, inter alia, are outside the scope of this assessment:

- maintenance of vegetation on the site;
- emergency evacuation procedures (except as outlined below); and

- compliance or otherwise of the works with the relevant provisions of the National Construction Code, Volume 1: Building Code of Australia.

The land within the site and surrounds is mapped as bushfire prone land for the purposes of Section 10.3 of the *Environmental Planning & Assessment Act 1979* (EP&A Act).

In relation to the first item of the SEARs above, *Planning for Bushfire Protection 2019* (PBP19) is the current guideline.

It is understood that the proposed work is subject to a Review of Environmental Factors and this assessment is to be referred to the NSW Rural Fire Service (RFS) to satisfy consultation procedures identified in the first dot point to item 18 of the SEARs.

## 2. The Proposal

---

The proposal is for the RACC project at Taronga Zoo. The project is shown on plans prepared by *dwp* (Project: RACC 20-0527) entitled *Taronga Zoo – Reptile + Amphibian Conservation Centre*.

An extract of the drawing entitled *Site Plan – New Works* (Drawing AA1100 Issue E dated 23.06.2021) is at Figure 2.1 on the following page.

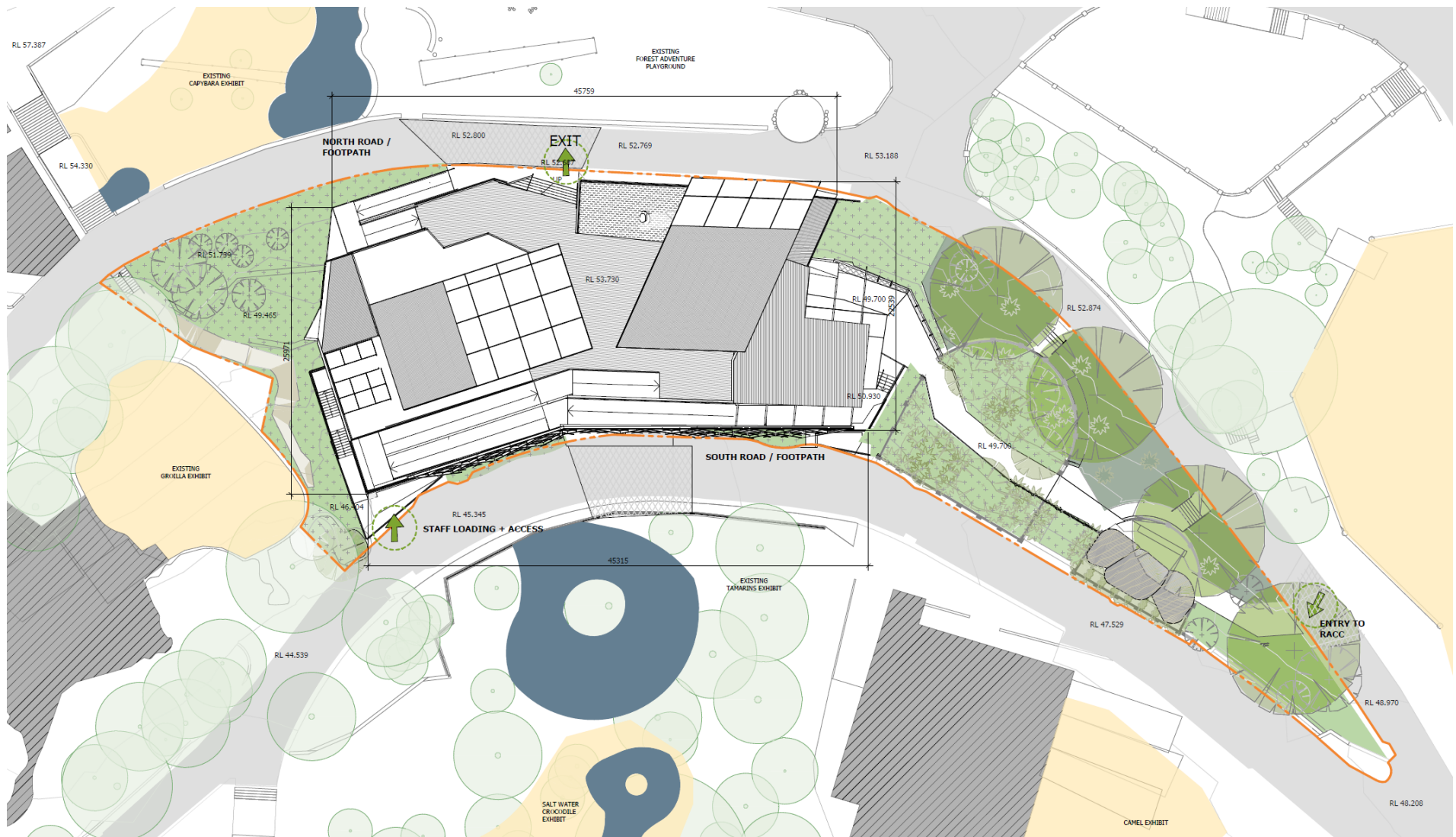


Figure 2.1: Site Plan Extract (Source: Client). North (approx.) to top of page.

### 3. The Site

---

Figure 2.1 indicates that the location of the proposed RACC is south of the Forest Adventure Playground and west of both the New Guinea Aviaries and the Camellia plants group (which, it is understood, has some heritage significance within the context of the Zoo).

The following photographs show the area on and around the proposed RACC facility within Taronga Zoo.



**Photo 2.1: View of the site of the proposed RACC, at right, with the retaining wall and bins marking the approximate western extent of the RACC project.**



**Photo 2.2: View looking past the New Guinea aviaries exhibit (at right), with the proposed RACC location in the cleared area to the right of the path/walkway.**



**Photo 2.3: Looking north through the location of the proposed RACC. The project will involve the removal of most or all the vegetation behind the cleared area, with ramps and walkways proposed to be constructed from the terrace/walkway above/north of the RACC location (see Figure 2.1).**



**Photo 2.4: View of part of the New Guinea Aviaries exhibit to the east of the proposed RACC location.**



**Photo 2.5: View, from about the same location as Photo 2.4, looking east/north-east (away from the proposed RACC) past the New Guinea aviaries exhibit (at left).**



**Photo 2.6: View of part of the Forest Adventure Playground, located north of the proposed RACC.**

#### **4. Planning for Bush Fire Protection 2019**

---

The NSW Rural Fire Service guideline, *Planning for Bush Fire Protection 2019* (PBP19), is applicable to all development on bushfire prone land.

The RACC project is not development for a “*special fire protection purpose*” (SFPP) as defined under the provisions of Section 100B of the *Rural Fires Act 1997* or as listed under Clause 46 of the *Rural Fires Regulation 2013* and there are no specific controls applicable for the purposes of PBP19.

The aim and objectives of PBP19 apply to the proposal.

The aim of PBP19 is *to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*

The objectives of PBP19 are to:

- i. afford buildings and their occupants protection from exposure to a bush fire;*
- ii. provide for a defensible space to be located around buildings;*
- iii. provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*
- iv. ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*
- v. provide for ongoing management and maintenance of BPMs; and*
- vi. ensure that utility services are adequate to meet the needs of firefighters.*

While the proposed RACC is a Class 9 building for the purposes of the *National Construction Code: Volume 1 – Building Code of Australia: Class 2 to 9 buildings* (NCC/BCA) it is not development for a SFPP as discussed above. With reference to NSW G5.2 (Protection) of the NCC/BCA, the NCC/BCA and/or AS3959-2018 do not apply any bushfire-resisting construction requirements to the proposed RACC as it is not “a Class 9 building that is a special fire protection purpose”.

## **5. Assessment of vegetation and slope**

---

The Taronga Zoo site contains a considerable amount of vegetation mainly comprising landscaping and retained vegetation within the larger Zoo complex.

Overall, this vegetation comprises maintained vegetation, managed as part of the operational procedures of the Zoo, and is fragmented by the constructed pathways, retaining structures, and infrastructure associated with the Zoo and within the Zoo grounds. Land within the Zoo grounds around the proposed RACC is considered as managed land, with any retained areas of vegetation being maintained subject to the overall vegetation management regime within the Zoo site.

There is no unmanaged vegetation within 140 metres of the proposed RACC project.

The largest area of potential bushfire hazard vegetation in relation to the RACC project comprises a relatively large area of *forest* vegetation located outside the Zoo site, within an area of National Park on the eastern side of Bradleys Head Road. The proposed RACC is more than 200 metres from the vegetation on the eastern side of Bradleys Head Road.

For the purposes of Section A1.4 of *PBP19*, the effective slope, that is, the slope under *forest* vegetation within the area of National Park on the eastern (opposite) side of Bradleys Head Road, is at least >10-15° downslope within the area of vegetation to the east of the footpath along the eastern side of Bradleys Head Road. Any land within 100 metres of the RACC is within the Zoo grounds.

## 6. Objectives of *Planning for Bush Fire Protection 2019*

---

In relation to the objectives of *Planning for Bush Fire Protection 2019*, the following points are relevant:

**Objective (i)**: *afford buildings and their occupants protection from exposure to a bush fire*

**Comment**: The proposal does not involve the erection of any buildings that will be 'occupied'. It is noted that the proposed RACC project will be one of the many facilities within Taronga Zoo that patrons will pass through while within the grounds and will not involve the accommodation of large numbers of people for any extended period.

**Objective (ii)**: *provide for a defensible space to be located around buildings*

**Comment**: The proposal does not reduce the extent of defensible space available within the Zoo grounds. The proposed RACC is more than 200 metres from the nearest areas of unmanaged potential bushfire hazard vegetation (which is on the eastern side of Bradleys Head Road and within the area of National Park on the eastern side of Bradleys Head Road). To the east of the Zoo grounds, the existing constructed roadway in Bradleys Head Road and footpath along the eastern side of the road provides a defensible space for emergency services to undertake property protection after the passage of a bushfire.

**Objective (iii):** *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings*

**Comment:** As per (ii) above, the proposed RACC project will not reduce the extent of defensible space and there is sufficient separation distance available between the location of the RACC and any unmanaged vegetation outside the Zoo grounds, within the area of National Park on the eastern side of Bradleys Head Road.

**Objective (iv):** *ensure that appropriate operational access and egress for emergency service personnel and occupants is available*

Internally, the Zoo also has its own firefighting capability and access to the RACC by staff undertaking fire suppression activities is via internal pathways/roadways which bound the proposed RACC location to the north and south. The condition and width of the internal roadways in the area south of the exhibit areas are shown in Photos 2.1, 2.2, 2.5 and 2.6. In relation to operational access to the nearest areas of unmanaged potential bushfire hazard vegetation (>200 metres from the proposed RACC), the existing constructed roadway in Bradleys Head Road and footpath along the eastern side of the road provides a defensible space for emergency services to the east of the overall Zoo site after the passage of a bushfire.

**Objective (v):** *provide for ongoing management and maintenance of bushfire protection measures*

**Comment:** The proposed RACC is more than 200 metres from the nearest areas of unmanaged potential bushfire hazard vegetation (which is on the eastern side of Bradleys Head Road and within the area of National Park on the eastern side of Bradleys Head Road). This is based on land within the Zoo grounds around the proposed RACC being considered as managed land, with any retained areas of vegetation being maintained subject to the overall vegetation management regime within the Zoo site.

**Objective (vi):** *ensure that utility services are adequate to meet the needs of firefighters*

**Comment:** Existing utility services are available to the Zoo site – including mains water, fire services to existing buildings and hydrants – to meet the needs of fire fighters.

## 7. Comment on Bushfire Evacuation Procedures

---

As noted previously, the second dot point of item 18 of the SEARs is outside the scope of the bushfire assessment matters. While this is the case, the client has requested that this document include a brief discussion of matters relating to bushfire evacuation in relation to the proposed RACC.

In this regard, the client has provided a copy of the document entitled “Emergency Response Plan: Taronga Zoo” (September 2019, Version 2.2) for review. The Emergency Response Plan states that:

- All procedures have been developed in accordance with *Australian Standard AS 3745-2010 “Planning for emergencies in facilities”*.
- The objective of the Emergency Response Plan is to equip Taronga Zoo staff with the knowledge and skills to control and coordinate an emergency event until the arrival of attending emergency services.
- the focus should be the safe evacuation of workers and visitors rather than property protection or disaster mitigation.
- An emergency can develop from any number of causes.
- To fully comply with Work Health and Safety Legislation, Taronga Zoo management should ensure that a process for identifying, assessing, controlling and reviewing hazards is implemented. This process will assist all parties identify key risk factors that may contribute to an emergency event situation.
- The emergency response plan sets out guidelines to enable Taronga Zoo to plan for and respond to internal and external emergencies. It applies to the property boundary, which encompasses the office, its grounds and ancillary structures.

As noted previously, the RACC facility will comprise a relatively small component of the overall Taronga Zoo complex. The RACC, like other exhibits and publicly accessible facilities within the Zoo, will only be accessible by the public during the hours that the Zoo is open to the public. In circumstances where it is deemed unsafe to open the Zoo to the public for whatever reason, then the exhibit will be inaccessible.

As such, the RACC will be subject to a range of emergency management procedures that apply to the overall Zoo, most of which have nothing to do with bushfire. The existing emergency management procedures for the Zoo, which also include a range of potential events unrelated to bushfire, include measures for the evacuation and relocation of patrons within the Zoo generally, and these include those patrons visiting any of the exhibits.

At the table on page 7 of the Emergency Response Plan, bushfire is identified as a 'special hazard' for the Zoo.

The Plan identifies (in the event of an emergency):

- Primary Evacuation Areas, being:
  - Overflow car park.
  - B2B gate.
  - Ferry Wharf.
  - Staff car park adjacent security portal.
- Safe House Locations, being:
  - Taronga Food Market.
  - The View Restaurant (if open).
  - B2B House, Barn & Wombat Burrows.
  - Taronga Function Centre.
  - Underground Viewing Area.
  - Centenary Theatre.
  - Heritage Boardroom.
  - All lockable vehicles & buildings, except exhibits.
  - Wild Asia Classroom.
  - Seal Show Loading Dock.
  - Taronga Institute of Science of Learning.

Importantly the Emergency Response Plan also identifies that 24 hour on-site security personnel are available to deal with any emergency that may develop.

The Section of the Emergency Response Plan headed 'Specific Risks with Emergency Priority Rating' (commencing on page 16) includes "fire/smoke" (Code Red) and "external emergency" (Code Brown) as specific incident types. The Plan includes bushfire within both the Code Red and Code Brown incident types.

Regarding the risk of bushfire, the Plan identifies:

- The risk rating as “high” for a fire (Code Red) incident; and
- The risk rating as “moderate” for an external emergency (Code Brown) incident.

Later sections of the Plan identify bushfire as a Code Red incident type and, therefore a “high risk. For a high risk, the Emergency Response Plan identifies the following treatment:

- Partial evacuation or lockdown.
- Take immediate action to eliminate and mitigate further risk.
- control the hazard if safe to do so.

Section 3 (Response Procedures) of the Emergency Response Plan identifies code response procedures. Guidelines for response to a bushfire as a “Code Red” emergency are at page 46 of the Plan. These identify that evacuation procedures (for the overall Zoo complex) are to be followed if an evacuation is required.

The location of the proposed RACC facility will be more than 200 metres from the nearest areas of unmanaged potential bushfire hazard vegetation (which is on the eastern side of Bradleys Head Road and within the area of National Park on the eastern side of Bradleys Head Road).

A substantial facility that is located near the eastern boundary of the Zoo with Bradleys Head Road is the ‘Wildlife Retreat at Taronga’.

The Emergency Response Plan includes a range of measures in relation to the Wildlife Retreat, mostly to do with the early detection of bushfire. The section headed ‘Wildlife Retreat at Taronga’ states:

- Taronga Zoo is a highly managed site.
- 24-hour security is present on site all year round.
- a bushfire in the vegetation to the east of the Wildlife Retreat has the potential to impact accommodation buildings due to their close proximity.
- In the event of a bushfire occurring within vegetation between the Taylors Bay foreshore and the eastern side of Bradleys Head Road, any evacuation of guests from the Wildlife Retreat will be into the Zoo.
- precinct to ensure that all occupants of the facility can be accounted for. There is no proposal to evacuate any guests from the site to Bradleys Head Road in such an event.

- The existing 24/7 security system at the Taronga Site has been extended to include a bushfire monitoring system. The bushfire monitoring system is capable of detection and activating an alarm without human intervention and serves as an early-warning system to alert staff and occupants of a bushfire scenario to facilitate early notification and evacuation

The above dot points in relation to the bushfire related matters to do with the Wildlife Retreat indicate that, when considering the proposed RACC location (which is west of the Wildlife Retreat and >200 metres from the eastern boundary of the Zoo grounds with Bradleys Head Road):

- measures are in place for the early detection of any bushfire within the land (National Park) to the east of Bradleys Head Road, between the Taylors Bay foreshore and Bradleys Head Road; and
- In the event of a bushfire occurring within vegetation on the eastern side of Bradleys Head Road, any evacuation of guests will be into the Zoo. The same manner of evacuation – into the Zoo – would apply to the proposed RACC, away from the potential bushfire threat outside the eastern boundary of the Zoo grounds.

If evacuation of patrons was necessary during the times that the Zoo was open to the public, because of bushfire or any other relevant trigger, then the existing emergency management procedures establish how and where those patrons would be evacuated to. If a bushfire event occurred outside opening hours, then the Zoo would remain closed to the public meaning that access would not be available to the Zoo grounds and/or exhibits be prevented for the duration of the emergency event.

## 8. Conclusion

---

The Taronga Zoo site contains a considerable amount of vegetation, mainly comprising landscaping and retained vegetation within the larger Zoo complex. The Zoo site is subject to detailed operational procedures and is stringently managed and monitored to ensure public safety and the safe and efficient operation of the Zoo. Aspects of this management include maintenance of the vegetation within the site and numerous exhibits.

Overall, vegetation around the site of the RACC project includes areas of remnant vegetation, fragmented by constructed pathways, retaining structures, and other infrastructure within the Zoo grounds.

The project area will exclude vegetation within the confines of the RACC. As such, areas of vegetation around the RACC will comprise retained and maintained vegetation which is managed in conjunction with the overall Zoo complex and subject to the overall vegetation management regime within the Zoo site.

The nearest areas of unmanaged potential bushfire hazard vegetation will be greater than 200 metres east of the proposed RACC, on the eastern side of Bradleys Head Road and within the area of National Park on the eastern side of Bradleys Head Road, in the area between the road and the western foreshore of Taylors Bay.

This assessment has noted that the NCC/BCA and/or AS3959-2018 does not apply any bushfire-resisting construction requirements to the proposed RACC as it is not “a *Class 9 building that is a special fire protection purpose*”. If AS3959 did apply, there would be no construction requirements applicable to the proposed RACC as it is more than 100 metres from the nearest areas of unmanaged potential bushfire hazard vegetation. This is based on land within the Zoo grounds around the proposed RACC being considered as managed land, with any retained areas of vegetation being maintained subject to the overall vegetation management regime within the Zoo site.

It is noted that the proposed RACC will not facilitate the accommodation of large numbers of people for any extended period, being one of the many facilities within the Zoo that patrons will pass through while within the grounds.

## 9. Recommendations

---

In relation to the proposed Reptile and Amphibian Conservation Centre (RACC) project at Taronga Zoo it is recommended that the Emergency Response Plan be updated to reference the RACC prior to commissioning the use of the new facility.

## References

---

Australian Building Codes Board (2019)

*National Construction Code: Volume One – Building Code of Australia 2019 (Amendment 1)*

NSW Rural Fire Service (2019)

*Planning for Bush Fire Protection 2019*

Standards Australia (2018)

*Australian Standard 3959-2018: Construction of buildings in bushfire-prone areas*

### NOTE & DISCLAIMER:

1. *Only the plans referenced in this Assessment have been considered in relation to the aim and objectives of Planning for Bush Fire Protection 2019.*
2. *Notwithstanding the precautions recommended, it should always be remembered that bushfires burn under a range of conditions and an element of risk, no matter how small, always remains.*
3. *This Assessment makes no conclusion or inference as to the measures required for the compliance of the project with the relevant provisions of the Building Code of Australia (BCA). Issues related to compliance of the building with the BCA are outside the scope of this Assessment.*