

April 2025

# Taronga Zoo Sky Safari

Appendix DD  
Bushfire Assessment  
RTS Revision 2

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CONSERVATION SOCIETY AUSTRALIA  
*For the Wild*



# **Bushfire Assessment**

## **For**

### **Taronga Zoo Sky Safari Project**

**Prepared for:**  
**Taronga Conservation Society Australia**

**April 2025 (Final – Rev 3)**

**Project: 22442**

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## 1. Executive Summary

This Bushfire Assessment has been prepared by ABAC Australian Bushfire Assessment Consultants to accompany a detailed State Significant Development Application (SSDA) for the redevelopment of the Taronga Zoo Sky Safari at Taronga Zoo ('the Zoo').

The site is legally described as Lot 22 on Deposited Plan 843294 and is Crown Land managed by the Taronga Conservation Society Australia (TSCA).

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-46807958).

This report concludes that the proposed Taronga Zoo Sky Safari development is suitable and warrants approval subject to the implementation of the following mitigation measures:

- A.** The support pylons for the Taronga Zoo Sky Safari project are to be constructed of non-combustible material; and
- B.** The structural elements for the proposed Lower Entrance Station are to be of materials capable of achieving a Fire Resistance Level (FRL) of 30/-/- (noting that this will only apply if any other project requirements for fire-resisting construction are lesser);
- C.** The Taronga Zoo Emergency Response Plan is to be updated to include the proposed Sky Safari and is to include shut down and evacuation procedures for the Taronga Zoo Sky Safari project in the event of a bushfire event;
- D.** Any plan for landscaping and revegetation within any areas associated with the Sky Safari project should be prepared in consultation with an accredited bushfire consultant and should address (in order of priority):
  - (i) compatibility with animal welfare, and maintenance of habitat and containment requirements in any within any exhibit areas under, or directly adjacent to, any part of the Taronga Zoo Sky Safari project; and
  - (ii) Taronga Zoo's own horticulture and public safety requirements; and
  - (iii) the principles of Appendix 4 of *Planning for Bushfire Protection 2019*.

Following the implementation of the above mitigation measures, the remaining impacts are appropriate.

## 2. Introduction

This report has been prepared to accompany an SSDA for the redevelopment of the Sky Safari at Taronga Zoo, which is legally described as Lot 22 on Deposited Plan 843294.

Taronga Conservation Society Australia is a a statutory body representing the Crown. The Minister for Planning and Public Spaces, or their delegate, is the consent authority for the SSDA and this application is lodged with the NSW Department of Planning, Housing and Infrastructure (DPHI) for assessment as the works are located within the Taronga Zoo site and have an estimated development cost that exceeds the \$10 million threshold pursuant to Clause 2(h) of Schedule 2 of the *State Environmental Planning Policy (Planning Systems) 2021*.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 11 August 2022 and issued for the SSD- 46807958. Specifically, this report has been prepared to respond to the SEARs requirement issued below.

Item	Description of requirement
23. Bush Fire Risk	If the development is on bush fire prone land, or a bush fire threat is identified on or adjoining the site, provide a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with <i>Planning for Bush Fire Protection</i> .

The SSDA was placed on public exhibition for 28 days between 24 September to 22 October 2024. Since lodgement, the project team have refined the proposal to address comments from public agencies and the public as well as ongoing design development. The proposed refinements include updates to the Top and Lower Stations to improve queuing and visitor experience and the pylon design to reflect inputs from the cable car contractor.

In terms of the land comprising the Taronga Zoo site, land in the eastern/south-eastern and western parts of the site is land recorded/mapped as bushfire prone land for the purposes of Section 10.3 of the *Environmental Planning & Assessment Act 1979* (EP&A Act).

The scope of this assessment is limited to the consideration of the proposed Taronga Zoo Sky Safari redevelopment project.

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

- maintenance of vegetation on the site;
- emergency evacuation procedures; and
- compliance or otherwise of the works with any relevant provisions of the National Construction Code/Building Code of Australia (NCC/BCA), if applicable.

### **3. Site Description**

Taronga Zoo is located at Bradleys Head Road, Mosman and is situated in the Mosman Local Government area (LGA) and on Cammeragal Country. The site is bounded by Bradleys Head Road to the east, Athol Wharf Road and Sydney Harbour to the south, Little Sirius Cove to the west and Whiting Beach Road to the south-west. Taronga Zoo is legally described as Lot 22 on DP843294 and is Crown Land managed by the TCSA (the Zoological Park Board). Taronga Zoo has been subject to numerous upgrades and redevelopment schemes over time, to stay compliant with contemporary regulations, meet contemporary animal welfare and contemporary visitor experience expectations.

Taronga Zoo has evolved over time from a Zoo that simply provides the traditional visitor experience of viewing animals in exhibits, to a Zoo that focusses on wildlife conservation, animal welfare and providing a range of visitor learning experiences. Taronga Zoo is one of Australia's most popular attractions, and together with Taronga Western Plains Zoo hosts more than 1.8 million visitors annually.

The Sky Safari was an ageing asset within the Zoo and was retired on 31 January 2023. The former Sky Safari route is a lineal route of 450 metres with each one-way journey taking approximately 4 minutes. The retired Sky Safari utilised 9 pylons.

Access to the retired Sky Safari was open to all Zoo visitors generally between the hours of 9.30am-4.15pm as well as on special occasions such as VIVID, or to transport guests to conference facilities. The majority of trips were one way from the Lower Station near the Taronga Zoo Ferry Wharf as they entered the Zoo or from the Top Station near the Top Plaza (Main Entrance) as they exited the Zoo.

The former Sky Safari cable cars had a maximum capacity of six guests and could accommodate wheelchairs up to a width of 610mm but prams or wheelchairs which did not fold could not be transported given the size restraints.

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

The following photo shows the area under the proposed route (following substantially the same route as the now retired Sky Safari) for the Taronga Sky Safari project.



**Photo 1: The southern part of the existing Sky Safari facility. The photo shows that, where the route passes over areas of vegetation, the vegetation is maintained so that a clear separation is achieved between the vegetation and the gondolas.**



## 4. The Proposal

Taronga Zoo is one of Australia's most popular attractions, and together with Taronga Western Plains Zoo hosts more than 1.8 million visitors annually. The Zoo has evolved over time from a Zoo that simply provides the traditional visitor experience of viewing animals in exhibits, to a Zoo that focusses on wildlife conservation, animal welfare and providing a range of visitor learning experiences.

Within Taronga Zoo, the Sky Safari is one of Taronga's most loved experiences and has transported more than 20 million passengers since it was first installed in 1987 and upgraded in 2000. The former Sky Safari was an ageing asset and was formally retired in January 2023. The redevelopment of the existing Sky Safari will allow the Zoo to update the now obsolete infrastructure on site and provide new facilities which provide improved amenities, ease increased demand and assist the public in moving around the Zoo.

Development consent is specifically sought for:

- Site establishment works including removal of the existing Sky Safari;
- Installation of a new 916 metre Sky Safari cable car system including:
  - Construction of six (6) new pylons and associated infrastructure within pylon zones within the Zoo, ranging in height between 5.9 metres (P1) to 36.5 metres (P5).
  - Construction of two new stations at both the upper and lower entrances within the Zoo grounds.
  - Public facilities including accessible queueing areas, ticket booths and public amenities.
  - Associated mechanical plant, servicing and storage areas for ongoing maintenance.
- Landscaping works, including new accessible pathways, planting, shade structures and seating areas and wayfinding signage. Taronga has implemented a tree replacement ratio of 2:1 for all trees removed as part of this development.
- Excavation, site preparation works and tree removal/pruning to allow the works to occur.
- Increased hours of operation.

The proposal is not listed as development for a Special Fire Protection Purpose (SFPP) under either s100B of the *Rural Fires Act 1997* or Clause 47 of the *Rural Fires Regulation 2022*.

As such, the proposal has been considered as 'other development' for the purposes of Chapter 8 of the NSW Rural Fire Service guideline, *Planning for Bush Fire Protection 2019* (PBP).

The proposed route is shown in Figure 4.1.



**Figure 4.1: Aerial view of proposed Sky Safari route (North to top of page). Source: Client**

## 5. Bushfire Prone Land Mapping

In relation to bushfire prone land, it is noted that the *Environmental Planning & Assessment Act 1979* (EP&A Act) identifies bushfire prone land as being land recorded as such on a relevant map certified under section 10.3(2) of the Act.

In terms of the land comprising the Taronga Zoo site, land in the eastern/south-eastern and western parts of the site is land recorded/mapped as bushfire prone land for the purposes of Section 10.3 of the EP&A Act.

Figure 5.1 shows an aerial view of the site, and those parts of the land mapped as bushfire prone land. The approximate route for the Taronga Zoo Sky Safari project is also shown.

Figure 5.1 indicates that the southern part of the Taronga Zoo Sky Safari project (the Lower Entrance Station) will be on mapped as bushfire prone land. The mapped area is related to an area of Category 2 vegetation which extends around the western and south-western parts of the Zoo, in the foreshore areas to Little Sirius Cove and Whiting Beach.

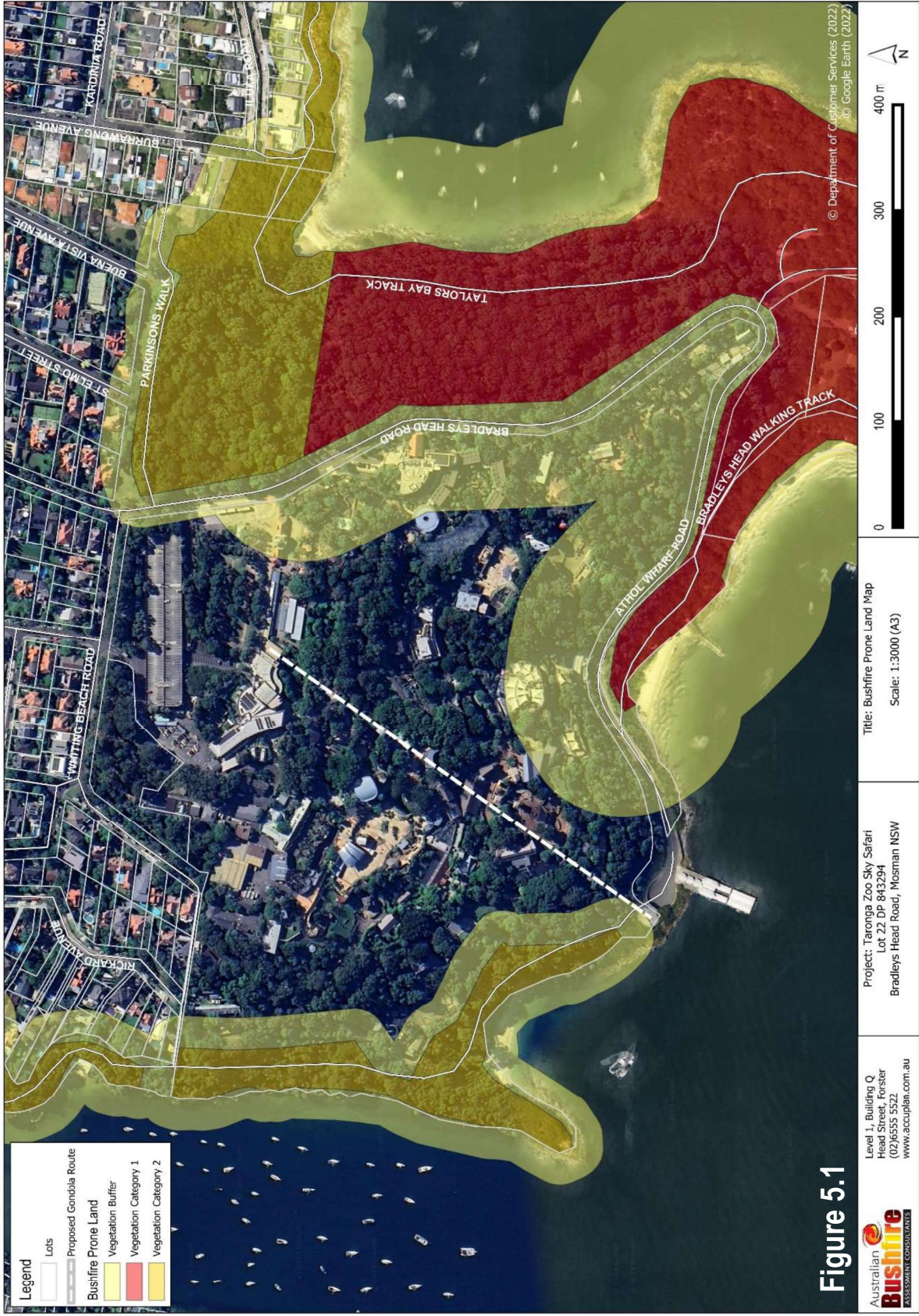
The mapping indicates that the proposed Lower Entrance Station will be located within the eastern extent of the mapped bushfire buffer to an area of Category 2 vegetation to the south-east of Whiting Beach.

To the east of the Lower Entrance Station, areas of Category 1 and Category 2 potential bushfire hazard vegetation are mapped on land in the part of the National Park to the south of Athol Wharf Road, between the Athol Bay foreshore and the southern side of the road. The project is outside this mapped area.

According to the bushfire prone land map, and aside from the southern part of the proposed route, there is no other mapped bushfire prone land directly under the proposed Taronga Zoo Sky Safari route.

Any vegetation under the proposed route is vegetation within the Zoo grounds which are managed in conjunction with the overall Zoo operations.







## 6. Assessment of Vegetation & Slope

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

The area of mapped bushfire prone land affecting the proposed Taronga Zoo Sky Safari route is shown as bushfire buffer (shown yellow) in Figure 5.1. Figure 5.1 indicates that the proposed Lower Entrance Station will be located within the eastern extent of the mapped bushfire buffer to an area of Category 2 vegetation to the south-east of Whiting Beach.

The relevant areas of vegetation in relation to the Taronga Zoo Sky Safari project comprise:

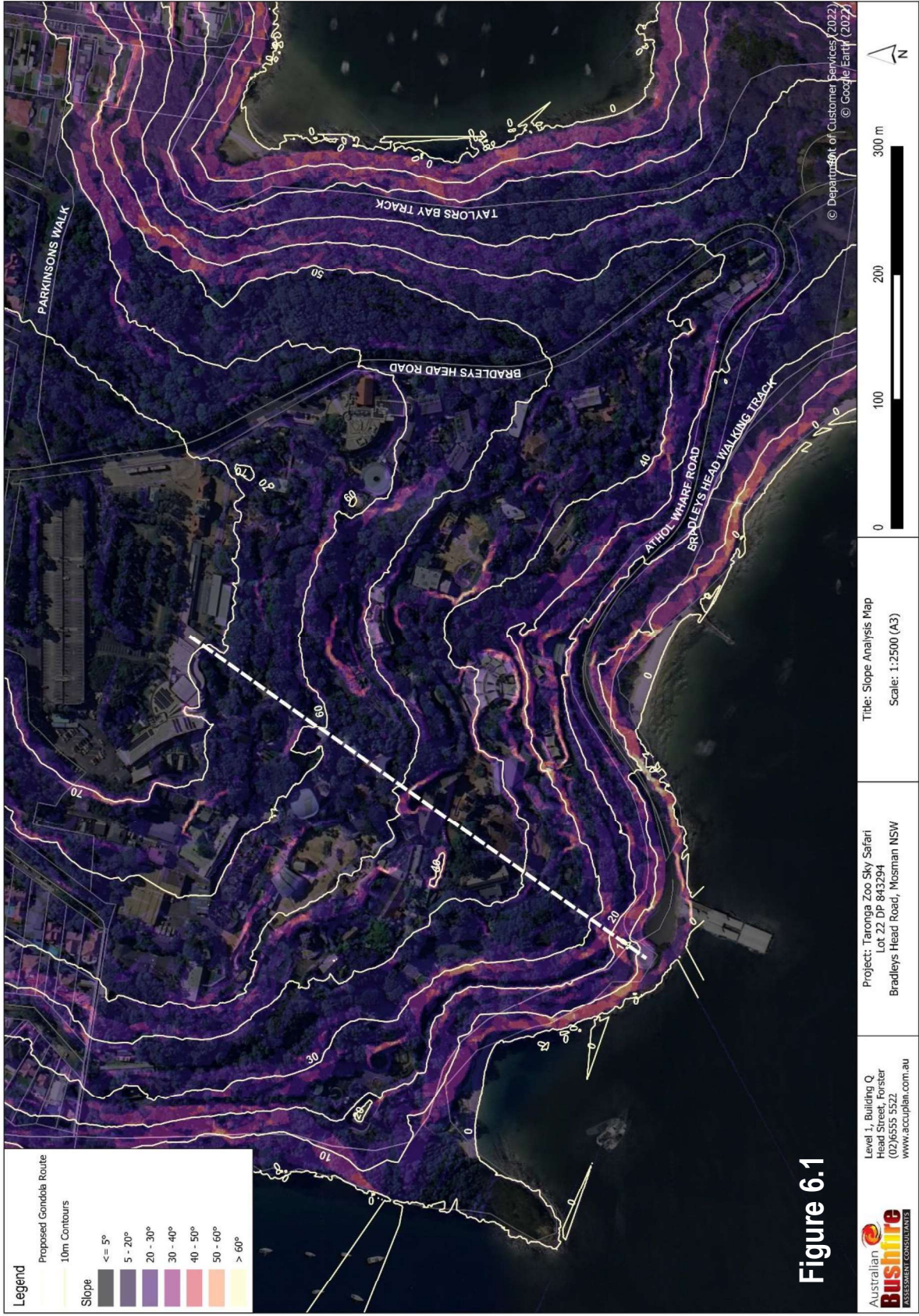
- foreshore vegetation extending south-east from Whiting Beach to the location of the Lower Entrance Station (and vegetation in the Zoo grounds directly to the north/north-west of the Lower Entrance Station which is mapped as bushfire buffer in Figure 5.1); and
- vegetation within the Zoo site (that the proposed route will pass through/over). Generally, this vegetation comprises maintained vegetation, managed as part of the operational procedures of the Zoo, and is fragmented by the constructed pathways, retaining structures, exhibits/enclosures, and other structures and infrastructure within the Zoo.

As landscaping and retained vegetation is an important element within Taronga Zoo, the recommendations of this assessment include:

*Any plan to be prepared for landscaping and revegetation within any areas associated with the Sky Safari project should address (in order of priority):*

- compatibility with animal welfare, and maintenance of habitat and containment requirements in any within any exhibit areas under, or directly adjacent to, any part of the Taronga Zoo Sky Safari project; and*
- Taronga Zoo's own horticulture and public safety requirements; and*
- the principles of Appendix 4 of Planning for Bushfire Protection 2019.*

For the purposes of Section A1.4 of PBP, the effective slope of land is highly variable throughout the Zoo site. This is illustrated in Figure 6.1, which shows the slope of land relative to the proposed route. Figure 6.1 indicates that the steepest areas of land within the Zoo site are under the part of the route which is proposed to extend north-east from the (southern) Lower Entrance Station and which follows the route of the now retired former Sky Safari facility and extends over parts of managed vegetation, cleared public areas, buildings and pathways, plazas and other infrastructure within the Zoo grounds.



## 7. Planning for Bush Fire Protection 2019

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

As noted previously, the proposal is not listed as development for a Special Fire Protection Purpose (SFPP) under either s100B of the *Rural Fires Act 1997* or Clause 47 of the *Rural Fires Regulation 2022*.

As such, the proposal has been considered as 'other development' for the purposes of Chapter 8 of the NSW Rural Fire Service guideline, *Planning for Bush Fire Protection 2019* (PBP).

The aim and objectives of PBP apply to the proposal.

The aim of *Planning for Bush Fire Protection 2019* (PBP) 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 PBP 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.*

## 8. Chapter 8 of Planning for Bush Fire Protection 2019

According to Part 8.1 of *Planning for Bush Fire Protection 2019* (PBP), 'other development' is to:

- (i) *satisfy the aim and objectives of PBP (outlined in Chapter 1 of PBP);*
- (ii) *consider any issues listed for the specific purpose for the development (set out in Chapter 8 of PBP); and*
- (iii) *propose an appropriate combination of bush fire protection measures (BPMs).*

Table 8.1.1 sets out an assessment of the proposal in relation to the objectives of PBP.

The assessment has demonstrated that the objectives of PBP do not fit the proposed Taronga Zoo Sky Safari project as they would, for example, a typical building proposal. Nonetheless, Table 8.1.1 has considered the aspects of the proposal against the general intent of the objectives. The assessment has concluded that, where relevant, the proposal is consistent with the aim and objectives of PBP.

Table 8.1.1		
Objective		Comment
i	<i>afford buildings and their occupants protection from exposure to a bush fire</i>	<p>The proposed development is transport infrastructure for visitors to the Zoo and is not a 'building'. It will convey people between the Taronga Zoo Wharf ferry terminal and main entrance to the Zoo. The route of the Taronga Zoo Sky Safari will follow the course shown in Figures 4.1, 5.1 and 6.1.</p> <p>The Taronga Zoo Sky Safari will not be 'occupied', except for the times when people are using the facility to travel between the stations.</p> <p>Given the nature of the proposal, the means of affording occupants 'protection from exposure to a bushfire' would rely on management in use procedures which include measures for the Taronga Zoo Sky Safari facility to be shut down in the event of any bushfire impacting on the Zoo site (or any bushfire in the general area which may be deemed to pose an imminent risk to the Zoo site).</p> <p>Project details indicate that the overall proposal will incorporate six (6) pylons and two (2) stations/stops.</p> <p>The main construction elements will be non-combustible pylons (presumably of steel construction) with varying heights above ground level, with the cable(s) and cars suspended above the Zoo grounds throughout the route.</p>



**Table 8.1.1**

	<b>Objective</b>	<b>Comment</b>
		<p>As the proposed Lower Entrance Station will be in proximity to areas of potential bushfire hazard vegetation, particularly in the foreshore areas to the north-east of the station, the recommendations of this assessment include that the structural elements for the proposed Lower Entrance Station be constructed of materials capable of achieving a Fire Resistance Level (FRL) of 30/-/- (noting that this will only apply if any other project requirements for fire-resisting construction are lesser).</p>
ii	<p><i>provide for a defensible space to be located around buildings</i></p>	<p>The proposed development is transport infrastructure for visitors to the Zoo and is not a 'building'.</p> <p>The construction and operation of the redeveloped Taronga Zoo Sky Safari facility will involve defined areas around pylons and subject to any ground infrastructure being maintained to ensure the safe and efficient operation of the facility.</p> <p>In general, people using the facility will be in the cable cars above the ground and the provision of defensible space is not relevant in relation to parts of the route between the stations.</p> <p>Obviously, as the Taronga Zoo Sky Safari route is passing over vegetation within the Zoo site, then there may always be an inherent risk to the facility if any bushfire affects that vegetation. The facility itself would rely on its non-combustible construction and non-combustible components for resilience against any bushfire impacts.</p> <p>As discussed in relation to objective (i), the main priority in terms of visitors to the Zoo would be the implementation of management in use procedures which include measures for the Taronga Zoo Sky Safari facility to be shut down in the event of any bushfire impacting on the Zoo site (or any bushfire in the general area which may be deemed to pose an imminent risk to the Zoo site).</p>
iii	<p><i>provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings</i></p>	<p>The main considerations relevant to this objective have been discussed in relation to objectives (i) and (ii) above.</p> <p>There is no apparent potential for the Taronga Zoo Sky Safari facility to contribute to fire spread to other buildings within the Zoo site when considered from a bushfire protection point of view.</p>

Table 8.1.1

	Objective	Comment
iv	<i>ensure that appropriate operational access and egress for emergency service personnel and occupants is available</i>	<p>The combat agency for any fire impacting upon the site is likely to be Fire &amp; Rescue NSW (FRNSW).</p> <p>In relation to the route of the proposed Taronga Zoo Sky Safari facility, there is no apparent potential for emergency vehicle access to the areas directly below all parts of the route.</p> <p>Along parts of the Taronga Zoo Sky Safari route, and/or areas near the route, there is a series of internal roads and pathways that can provide vehicular access to areas around parts of the route.</p> <p>As discussed in relation to other objectives considered in this Table, it is important that management in use procedures be adopted which include measures for the Taronga Zoo Sky Safari facility to be shut down in the event of any bushfire impacting on the Zoo site (or any bushfire in the general area which may be deemed to pose an imminent risk to the Zoo site).</p>
v	<i>provide for ongoing management and maintenance of BPMs</i>	<p>There are no BPMs readily applicable to a development of the nature proposed, except that the use and operation of the Sky Safari facility is to be subject to management in use procedures which include measures for the Sky Safari facility to be shut down in the event of any bushfire impacting on the Zoo site (or any bushfire in the general area which may be deemed to pose an imminent risk to the Zoo site).</p> <p>The main construction elements will be non-combustible pylons (presumably of steel construction) with varying heights above ground level, with the cable(s) and cars suspended above the Zoo grounds throughout the route.</p> <p>Also, as noted previously in this table, this assessment also recommends that the structural elements for the proposed Lower Entrance Station be of materials capable of achieving a Fire Resistance Level (FRL) of 30/-/- (noting that this will only apply if any other project requirements for fire-resisting construction are lesser).</p> <p>The construction and operation of the redeveloped Sky Safari facility will involve defined areas around pylons and any ground infrastructure being maintained to ensure the safe and efficient operation of the facility.</p> <p>In general, any landscaping design associated with the Taronga Zoo Sky Safari project should avoid the introduction of new plantings, or the revegetation of areas directly adjacent to any pylon structures along the proposed route of the Taronga Zoo Sky Safari. This is to limit the potential for any flame impingement on those support elements.</p>

Table 8.1.1		
Objective		Comment
		<p>In this regard, any plan for landscaping and revegetation within any areas associated with the Sky Safari project should be prepared in consultation with an accredited bushfire consultant and should address (in order of priority):</p> <ul style="list-style-type: none"> <li>(i) compatibility with animal welfare, and maintenance of habitat and containment requirements in any within any exhibit areas under, or directly adjacent to, any part of the Taronga Zoo Sky Safari project; and</li> <li>(ii) Taronga Zoo's own horticulture and public safety requirements; and</li> <li>(iii) the principles of Appendix 4 of <i>Planning for Bushfire Protection 2019</i>.</li> </ul>
vi	<i>ensure that utility services are adequate to meet the needs of firefighters</i>	Existing utility services are available to the Zoo site – including mains water, fire services and hydrants – to meet the needs of firefighters.

## 9. NCC/BCA & AS3959-2018

Section 2.1 of PBP notes that building work on bushfire prone land must also comply with the requirements of the National Construction Code/Building Code of Australia (NCC/BCA).

It is assumed that the proposal will be subject to a separate assessment (by others) as to what building regulations might apply to the proposal and whether the proposed Taronga Zoo Sky Safari project is subject to the NCC/BCA.

For the purposes of this assessment, and in the absence of any other information to the contrary, it is assumed that the NCC/BCA will not apply to the proposal.

Based on this assumption, *Australian Standard 3959-2018: Construction of buildings in bushfire-prone areas* will also not apply to the proposal.

While this is the case:

- as part of the route passes over areas of vegetation within the Zoo site, a conservative approach has been adopted whereby the recommendations of this assessment include that the structural elements of the Taronga Zoo Sky Safari project are to be designed and constructed to be non-combustible; and

- As the proposed Lower Entrance Station will be in proximity to areas of potential bushfire hazard vegetation (particularly in the foreshore areas to the north-west of the Station), the recommendations of this assessment include that the structural elements for the proposed Lower Entrance Station be constructed of materials capable of achieving a Fire Resistance Level (FRL) of 30/-/- (noting that this will only apply if any other project requirements for fire-resisting construction are lesser).



## 10. Recommendations: Bushfire Protection Measures

In terms of Bushfire Protection Measures, the following is recommended for the proposed Sky Safari project at Taronga Zoo:

- A.** The support pylons for the Taronga Zoo Sky Safari project are to be constructed of non-combustible material; and
- B.** The structural elements for the proposed lower entrance station are to be of materials capable of achieving a Fire Resistance Level (FRL) of 30/-/- (that this will only apply if any other project requirements for fire-resisting construction are lesser);
- C.** The Taronga Zoo Emergency Response Plan is to be updated to include the proposed Sky Safari and is to include shut down and evacuation procedures for the Taronga Zoo Sky Safari project in the event of a bushfire event;
- D.** Any plan for landscaping and revegetation within any areas associated with the Sky Safari project should be prepared in consultation with an accredited bushfire consultant and should address (in order of priority):
  - (i) compatibility with animal welfare, and maintenance of habitat and containment requirements in any within any exhibit areas under, or directly adjacent to, any part of the Taronga Zoo Sky Safari project; and
  - (ii) Taronga Zoo's own horticulture and public safety requirements; and
  - (iii) the principles of Appendix 4 of *Planning for Bushfire Protection 2019*.

## References

NSW Rural Fire Service (2019)

*Planning for Bush Fire Protection 2019*

Standards Australia (2018)

*AS3959-2018 Construction of buildings in bushfire-prone areas*