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Peter Doyle
Project Manager, Renewal Statutory Planning
Sydney Opera House
Bennelong Point
GPO Box 4274
Sydney NSW 2001

**FUTURE DEVELOPMENT APPLICATIONS FOR THE RENEWAL OF THE
SYDNEY OPERA HOUSE: RELEVANCE OF THE FRAMEWORK FOR
BIODIVERSITY ASSESSMENT**

Cumberland Ecology
PO Box 2474
Carlingford Court 2118
NSW Australia
Telephone (02) 9868 1933
Mobile 0425 333 466
Facsimile (02) 9868 1977
Web: www.cumberlandecology.com.au

Dear Peter,

The purpose of this letter is to consider the need for formal biodiversity assessments to support future development applications for the re-development of the Sydney Opera House. This assessment considers the entire land area covered by the Sydney Opera House and the interior of the buildings (Lot 5 DP 775888 and Lot 4 DP 787933) hereafter referred to collectively as the subject site.

Our assessment is set out below, with figures provided in **Appendix A** and threatened species records summarised in **Appendix B**. Based on our assessment of biodiversity at the Sydney Opera House, we expect that the requirement for a biodiversity development assessment report for development applications should be waived.

This document has been prepared by Dr David Robertson, Director of Cumberland Ecology Pty Ltd. David is an Accredited Assessor (BAAS17027). David's qualifications and experience are set out in **Appendix C**.

1. Background

1.1 Development Approval Pathway

We understand that due to the operation of *State Environmental Planning Policy (State and Regional Development) 2011*, all development at the Sydney Opera House is classed as State Significant Development (unless otherwise exempt). State Significant Development is declared under Part 4, Division 4.1, of the *NSW Environmental Planning and Assessment Act 1979*.

1.2 Assessment Requirements for State Significant Development

Section 7.9 of the NSW *Biodiversity Conservation Act 2016* (BC Act), requires all development applications for State Significant Development to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.

The main steps in the biodiversity assessment process for State Significant Development are as follows:

1. The Planning Agency Head and the Environment Agency Head determines if the Biodiversity Offsets Scheme applies to the State Significant Development and specifies the environmental assessment requirements;
2. The proponent engages an accredited person to assess the development site using the Biodiversity Assessment Method (BAM) and a biodiversity development assessment report is prepared;
3. The approval authority considers any serious and irreversible impacts and determines whether there are additional and appropriate measures to minimise impacts;
4. The approval authority sets an offset obligation as part of the Conditions of Approval; and
5. The proponent meets their offset obligation and begins their development.

The BAM sets out clear and repeatable methods to conduct an assessment of direct and indirect impacts. The BAM is supported by the BAM Tool, which is a web-based tool that quantifies direct impacts using 'biodiversity credits'. Two types of credits are generated by the BAM Tool, ecosystem credits and species credits. Ecosystem credits are calculated based on a number of variables including landscape features, native vegetation and ecosystem credit species (species that are reliably predicted by habitat surrogates). Species credits are calculated based on the number of individuals (flora) or the area of habitat (fauna) of species credit species (species that are not reliably predicted by habitat surrogates).

The BAM includes a requirement to prepare a biodiversity development assessment report for the development site. The biodiversity development assessment report must be prepared by an accredited assessor. A proponent is required to submit the biodiversity development assessment report as part of an Environmental Impact Statement for a State Significant Development.

1.3 Waiver of Requirement to Prepare a Biodiversity Development Assessment Report

Section 7.9 of the BC Act indicates that there are some circumstances in which the Planning Agency Head and the Environment Agency Head will determine that a proposed development is not likely to have a significant impact on biodiversity values and as such, a biodiversity

development assessment report is not required to be prepared. Biodiversity values are defined under the BC Act and the *Biodiversity Conservation Regulation 2017* (BC Regulation), and include:

- Vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state;
- Habitat suitability—being the degree to which the habitat needs of threatened species are present at a particular site;
- Threatened species abundance—being the occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site;
- Vegetation abundance—being the occurrence and abundance of vegetation at a particular site;
- Habitat connectivity—being the degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range;
- Threatened species movement—being the degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle;
- Flight path integrity—being the degree to which the flight paths of protected animals over a particular site are free from interference;
- Water sustainability—being the degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.

For a waiver to be applied for future development at the subject site, it needs to be demonstrated that the above listed biodiversity values will not be significantly impacted.

2. Method

2.1.1 Site Inspection

Dr David Robertson of Cumberland Ecology visited the subject site on Friday, the 9th of February 2018 in the company of Mr Peter Doyle, project manager for Building Renewal Statutory Planning. The subject site was inspected by traversing the external landscape around the Sydney Opera House, and also by examining internal areas that are proposed for redevelopments.

2.1.2 Database Analysis

Database searches were conducted to identify threatened species, populations, that occur within the locality (1 km) using the NSW Office of Environment and Heritage (OEH) BioNet Atlas

database(OEH, 2018). The BioNet Atlas search facility was used to generate records of threatened flora and fauna species and populations listed under the BC Act within the search area. The number, age, and location of such records were considered to provide an indication of the species that could have the potential to occur on or around the subject site.

2.1.3 GIS Mapping

A desktop analysis was completed to identify whether any vegetation communities were present on or nearby the subject site. To do this, the subject site was plotted against the broad scale mapping compiled by the OEH for the Sydney Metropolitan area (OEH, 2016).

The results from the OEH BioNet Atlas search were downloaded and plotted onto an aerial image (Nearmap; dated 1-1-2018) corresponding to the subject site. This subsequently displayed any threatened species within the locality giving an idea of any potential for the species to be present within the subject site.

3. Key Findings

The subject site is an entirely artificial landscape, where a peninsular jutting into Sydney Harbour has been transformed by the construction of the Sydney Opera House. No garden beds or trees occur on the subject site.

As a cultural icon of Sydney and Australia, the building has been meticulously cared for and is constantly heavily used for concerts, performances and for general viewing by the public etc. It is in the interests of management to maintain a clean and hygienic built environment at all times. Such conditions are not conducive to habitation by native flora and fauna.

3.1.1 Native Vegetation

The desktop assessment of vegetation mapping revealed only Urban Exotic/Native vegetation within the 1 km locality. No vegetation, native, or otherwise occurs on the subject site.

For the purpose of this letter, native vegetation is as defined under the Local Land Services Act:

60B Meaning of “native vegetation”

- (1) For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:
 - (a) trees (including any sapling or shrub or any scrub),
 - (b) understorey plants,
 - (c) groundcover (being any type of herbaceous vegetation),
 - (d) plants occurring in a wetland.

- (2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.
- (3) For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:
 - (a) the plant is situated on land that is shown on the native vegetation regulatory map as category 2-vulnerable regulated land, and
 - (b) it would be native vegetation for the purposes of this Part if it were native to New South Wales.
- (4) For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under section 14.7 of the [Biodiversity Conservation Act 2016](#) that specified vegetation is or is not marine vegetation also has effect for the purposes of this Part.

3.1.2 Threatened Flora

No native vegetation occurs on site and no threatened flora species are likely to occur (Figure 1 and 2 **Appendix A**). No existing records of threatened flora species are present on or have been recorded from within a 1 km radius of the subject site. Due to the lack of nearby records and the highly developed nature of the subject site, it is considered unlikely that any threatened flora species would occur within the subject site. Additionally, the site inspection did not reveal any threatened flora species within the subject site.

3.1.3 Threatened Fauna

A limited number of threatened fauna species are known to occur in the vicinity of the subject site (Figure 1 and 2 **Appendix A**). No existing Wildlife Atlas records of threatened fauna species are present on the subject site, however a number of records occur adjacent to the subject site, within a 500 m radius (**Figure 2**). The Grey-headed Flying-fox (*Pteropus poliocephalus*), Wandering Albatross (*Diomedea exulans*) and New Zealand Fur Seal (*Arctocephalus forsteri*) are amongst the threatened fauna that occur in central Sydney and there are records within 500 metres of the subject site (**Figure 2**).

An individual New Zealand Fur Seal has frequented the steps leading into the water at the northern end of the subject site (Doyle pers comm.) – it is also recorded on the OEH BioNet Atlas.

There are many records of Grey Headed Flying Fox near to the subject site as there has been a substantial colony of the species roosting in the Royal Botanic Gardens for many years.

Some Microchiropteran bats are also known to forage in the city. These include but are not limited to Bentwing-bats (*Miniopterus australis* and *Miniopterus schreibersii oceanensis*). These

two species of bats are insectivorous cave roosting bats that often frequent buildings and infrastructure, sheltering in roofs, pipes and culverts, etc. (OEH, 2017a; OEH, 2017b)). It is conceivable that these species could occupy nooks and crannies in the buildings of the subject site

Of the threatened fauna species, only the Microchiropteran bats (particularly Bentwing-bats) have any chance of occurring within the Sydney Opera House. These bats could infiltrate small cracks, crevices and other openings in the Sydney Opera House to roost internally. However, given the meticulous maintenance of the buildings, such colonies are relatively unlikely to occur.

4. Biodiversity Values

The BC Act and the BC Regulation list a suite of biodiversity values that are relevant to assessments that must take place under the BC Act. To demonstrate that proposed actions at the Opera House will not impact upon biodiversity, **Table 1** systematically comments upon the relevance of each value.

Table 1 Assessment of Biodiversity Values within the Subject Site

Biodiversity Value	Assessment within Subject Site
BC Act - Part 1 Section 1.5 (2)	
(a) vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state,	No vegetation occurs on the subject site and none can be impacted by various proposals for the Opera House.
(b) habitat suitability—being the degree to which the habitat needs of threatened species are present at a particular site,	As discussed in the report above, the Opera House has almost no potential to provide habitat for threatened species other than possibly microbats within the roof cavity areas of the buildings.
(c) biodiversity values, or biodiversity-related values, prescribed by the regulations.	See below.
BC Regulation - Part 1 Clause 1.4	
(a) threatened species abundance—being the occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site,	As discussed above, the Sydney Opera House has almost no potential to provide habitat for threatened species other than possibly microbats within the roof cavity areas of the buildings.
(b) vegetation abundance—being the occurrence and abundance of vegetation at a particular site,	No vegetation occurs on the subject site and none can be impacted by various proposals for the Sydney Opera House.
(c) habitat connectivity—being the degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range,	The Sydney Opera House does not provide any notable habitat connectivity for any threatened species.

Table 1 Assessment of Biodiversity Values within the Subject Site

Biodiversity Value	Assessment within Subject Site
(d) threatened species movement—being the degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle,	As above, the subject site does not contribute to the movement of threatened species.
(e) flight path integrity—being the degree to which the flight paths of protected animals over a particular site are free from interference,	The Sydney Opera House will not be changed externally and so will not be changed in any way that would impact upon free-flying animals (threatened or otherwise) by interfering with flight paths.
(f) water sustainability—being the degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.	The waters of the harbour around the Sydney Opera House do sustain some threatened marine species. However, it is our understanding that no further developments are proposed that would impact upon the marine environment. Should any major marine developments be proposed around the periphery of the site in future, such impacts could trigger the need for assessments under the BAM.

5. Conclusion

Little if any scope occurs for redevelopment of the Sydney Opera House to have impacts upon defined biodiversity values generally – especially for internal redevelopments. Similar conclusions can be drawn for redevelopments that occur outside as at most, such redevelopment could occur in the locality of the foraging and sheltering areas for some species such as the Grey-headed Flying Fox.

When assessing impacts likely from development applications for internal redevelopments of the Sydney Opera House there is no justification for considering impacts to threatened species. That is, unless the redevelopment entails significant or substantial modifications of roof cavities. Such developments could conceivably impact upon roosting colonies of Microchiropteran bats such as Bentwing-bats, though the likelihood is low. Further investigations may be required for such development proposals and there is a possibility (albeit low) that assessments under the BAM could be triggered.

When assessing impacts likely from development applications for external redevelopments of the Sydney Opera House there is also very little likelihood of causing significant impacts to threatened species.

On the basis of our investigations, we believe that you should write to the Department of Planning and Environment and ask for a waiver of the need to prepare a biodiversity development assessment report for any subsequent development applications at the Sydney Opera House with the exception of development applications requiring major intrusive

reorganisation or changes to the roof cavities of the building or projects entailing major alterations to the adjacent marine environment. In such cases, searches for roosting bats in the roof cavity areas or marine investigations may be warranted.

If any further information is required, or if you have any questions, please do not hesitate to call me on (02) 9868 1933.

Yours sincerely,



Dr David Robertson

Director

David.robertson@cumberlandecology.com.au

References

OEH (2016). The Native Vegetation of the Sydney Metropolitan Area - VIS_ID 4489. Office of Environment and Heritage, Sydney.

OEH (2017a). Eastern Bentwing-bat - profile. Office of Environment and Heritage, Hurstville.

OEH (2017b). Little Bentwing-bat - Profile. NSW Office of the Environment and Heritage, Hurstville.

OEH (2018). "BioNet Atlas." 2018, from
http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

Appendix A

Figures



Legend

Subject Site

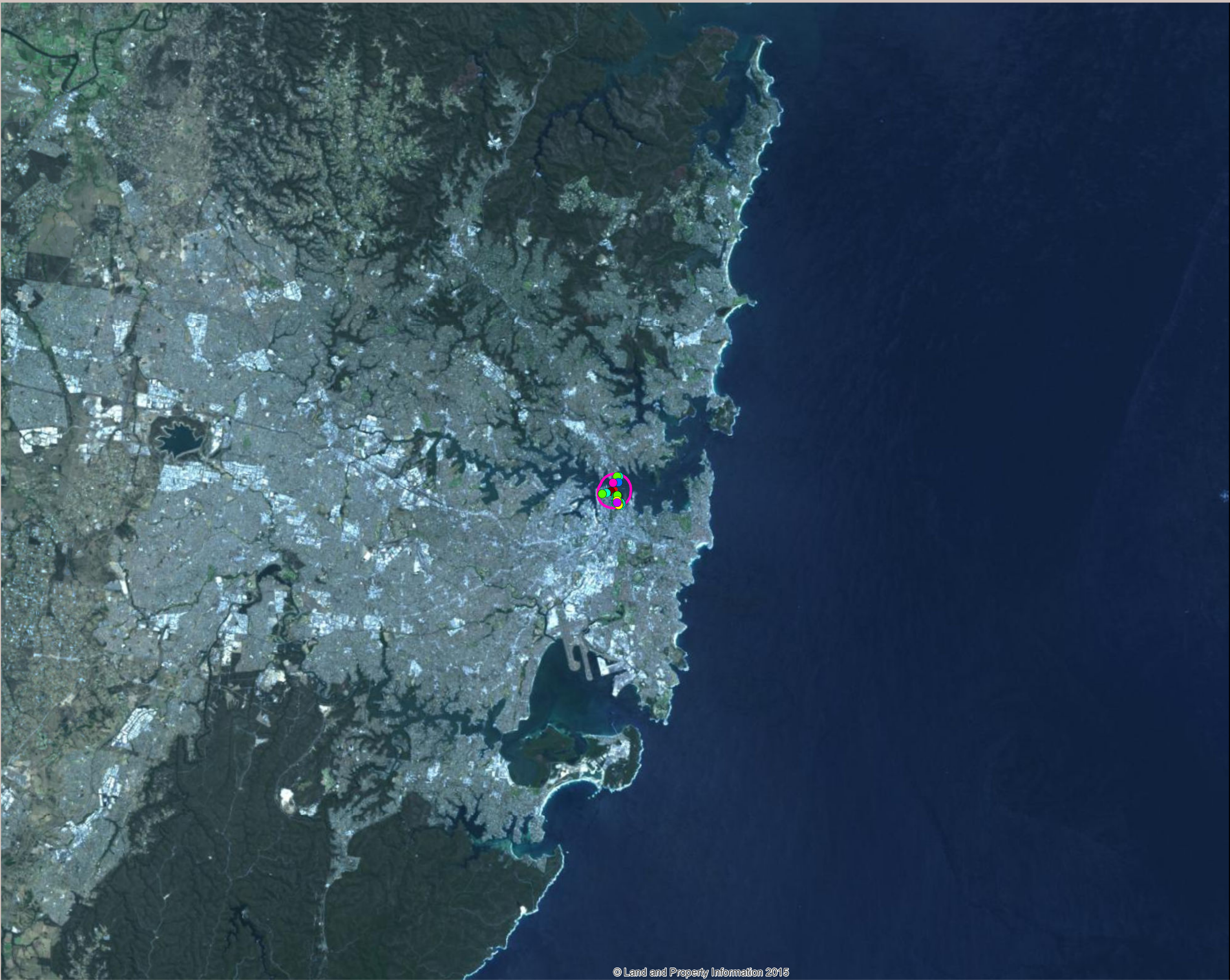
Image Source:
Image © NearMap 2018
Dated 18-1-2018

Coordinate System: MGA Zone 56 (GDA 94)

cumberland
ecology

0 50 100 150 200 m

Figure 1. Location of the subject site



Legend

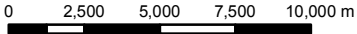
- Subject Site
- Locality 1 km

Threatened Fauna

- Common Tern
- Eastern Bentwing-bat
- Grey-headed Flying-fox
- New Zealand Fur-seal
- Powerful Owl
- Southern Myotis
- Southern Right Whale
- Swift Parrot
- Wandering Albatross
- Wedge-tailed Shearwater
- White-bellied Sea-Eagle



Coordinate System: MGA Zone 56 (GDA 94)



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Figure 2. Threatened Species within the Locality

Appendix B

Threatened Species Data

Table 1 **OEH Bionet Atlas Records (OEH, 2018)**

Class	Scientific Name	Common Name	NSW Status	Comm Status	Date Recorded
Aves	Diomedea exulans	Wandering Albatross	E	E,M	29/06/1985
Aves	Ardenna pacificus	Wedge-tailed Shearwater		M	1/10/1995
Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	V	M	16/01/2017
Aves	Sterna hirundo	Common Tern		M	26/12/1981
Aves	Lathamus discolor	Swift Parrot	E	E,M	25/06/2002
Aves	Ninox strenua	Powerful Owl	V		24/11/2014
Aves	Ninox strenua	Powerful Owl	V		23/01/2014
Aves	Ninox strenua	Powerful Owl	V		5/01/2015
Aves	Ninox strenua	Powerful Owl	V		27/12/2014
Aves	Ninox strenua	Powerful Owl	V		16/01/2015
Aves	Ninox strenua	Powerful Owl	V		19/01/2015
Aves	Ninox strenua	Powerful Owl	V		5/02/2015
Aves	Ninox strenua	Powerful Owl	V		4/03/2015
Aves	Ninox strenua	Powerful Owl	V		24/03/2015
Aves	Ninox strenua	Powerful Owl	V		4/05/2015
Aves	Ninox strenua	Powerful Owl	V		5/06/2015
Aves	Ninox strenua	Powerful Owl	V		22/06/2002
Aves	Ninox strenua	Powerful Owl	V		6/08/2015
Aves	Ninox strenua	Powerful Owl	V		26/08/2015
Aves	Ninox strenua	Powerful Owl	V		20/03/2012
Aves	Ninox strenua	Powerful Owl	V		17/05/2012
Aves	Ninox strenua	Powerful Owl	V		14/07/2012
Aves	Ninox strenua	Powerful Owl	V		27/07/2012
Aves	Ninox strenua	Powerful Owl	V		20/08/2012
Aves	Ninox strenua	Powerful Owl	V		31/10/2014
Aves	Ninox strenua	Powerful Owl	V		3/11/2015
Aves	Ninox strenua	Powerful Owl	V		5/08/2017
Aves	Ninox strenua	Powerful Owl	V		30/11/2004
Aves	Ninox strenua	Powerful Owl	V		1/05/2012
Aves	Ninox strenua	Powerful Owl	V		1/05/2000
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	2/01/2006
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/03/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	19/05/2011

Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/11/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	6/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	22/03/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	21/12/2010
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	1/02/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	1/02/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	6/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	7/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	10/07/2010
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	17/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	1/02/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	21/12/2010
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/11/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	13/12/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	11/08/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	1/02/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	3/02/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	13/12/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	18/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/05/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	7/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	8/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/11/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	14/03/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	5/07/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	25/11/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	7/08/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	14/03/2012

Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	6/09/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	19/04/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	10/05/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	9/05/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/03/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	17/04/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/03/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	14/12/2011
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	9/05/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/03/2012
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	18/01/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	15/02/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/03/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	18/04/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	16/05/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	23/07/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/06/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	15/08/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	19/09/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	21/11/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	17/10/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/02/2009
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/03/2009
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	17/04/2009
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	15/05/2009
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	19/06/2009
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	28/09/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	28/09/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	28/09/2008
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20/05/2004
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	22/07/2010
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	30/08/2002
Mammalia	Miniopterus schreibersii				
Mammalia	oceanensis	Eastern Bentwing-bat	V		8/10/2008
Mammalia	Miniopterus schreibersii				
Mammalia	oceanensis	Eastern Bentwing-bat	V		23/02/2015

	Miniopterus schreibersii				
Mammalia	oceanensis	Eastern Bentwing-bat	V		20/05/2014
Mammalia	Myotis macropus	Southern Myotis	V		23/02/2015
Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	V		27/07/1990
Mammalia	Eubalaena australis	Southern Right Whale	E	E	8/08/2002

Table 2 Likelihood of Occurrence Table

Species			Likelihood of occurrence:				
Class	Scientific Name	Common Name	No. Of Records from Wildlife Atlas 1 km radius	Within buildings	Around the exterior of the Opera House	Likelihood of impacts from DAs for projects within the Opera House.	Likelihood of impacts from DAs for projects outside the Opera House.
Aves	<i>Sterna hirundo</i>	Common Tern	1	Nil	Nil	Nil	Nil
Aves	<i>Ninox strenua</i>	Powerful Owl	25	Nil	Nil	Nil	Nil
Aves	<i>Lathamus discolor</i>	Swift Parrot	1	Nil	Nil	Nil	Nil
Aves	<i>Diomedea exulans</i>	Wandering Albatross	1	Nil	Nil	Nil	Nil
Aves	<i>Ardena pacificus</i>	Wedge-tailed Shearwater	1	Nil	Nil	Nil	Nil
Aves	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	1	Nil	Nil	Nil	Nil
Mammalia	<i>Miniopterus schreibersii</i> <i>oceanus</i>	Eastern Bentwing	3	limited chance to occur in roof cavity	may forage in locality	Low chance of impact if major works to the roof cavity or associated infrastructure are to occur.	Nil
Mammalia	<i>Pteropus poliocephalus</i>	Grey Headed Flying Fox	71	Nil	Animals frequently seen overflying site associated with botanical gardens.	Nil	Nil
Mammalia	<i>Miniopterus australis</i>	Little Bentwing	0	limited chance to occur in roof cavity	may forage in locality	Low chance of impact if major works to the roof cavity or	Nil

Table 2 Likelihood of Occurrence Table

Species			Likelihood of occurrence:				
						associated infrastructure are to occur.	
Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	1	Nil	Occasional individual seen on northern steps. Otherwise minimal.	Nil	Nil
Mammalia	Myotis macropus	Southern Myotis	1	limited chance to occur in roof cavity	may forage in locality	Low chance of impact if major works to the roof cavity or associated infrastructure are to occur.	Nil
Mammalia	Eubalaena australis	Southern Right Whale	1	Nil	Nil	Nil	Nil

Appendix C

CV - Dr David Robertson

Dr. David Robertson

Director



Dr David Robertson is a senior ecologist with more than 28 year's experience in ecological survey, impact assessment, and research. David is the director of Cumberland Ecology.

Recent consultancy work has included:

- Senior consultant for numerous mining projects in Australia and in the Philippines;
- Court appointed expert for the NSW Land and Environment Court;
- Flora and fauna investigations for Environmental Impact Assessments;
- Development of ecological management plans and habitat reconstruction;
- Negotiations about the level of mitigation measures required for flora and fauna impacts, and development of packages for compensatory habitats.

Key Industry Sectors

- Extractive Industry.
- Power Generation.
- Water.
- Transport.

Education

- Bachelor of Science (Honours), Ecology, University of Melbourne, 1980.
- Doctor of Philosophy, Ecology, University of Melbourne, 1986.

Relevant Experience

Environmental Impact Assessment

Directed numerous large ecological assessments for major EIA projects in a variety of service sectors in Australia and internationally. These include the power industry, water supply, road construction and mining.

Threatened species assessments

Directed or managed numerous threatened species assessments in Australia and overseas to

address legislative and policy requirements. Projects were conducted in numerous jurisdictions, involving legal and policy reviews. Work on threatened species has included preliminary survey and impact assessment, detailed impact assessment and mitigation, monitoring and plans of management.

Provision of Strategic Ecological Advice

Strategic ecological advice has been provided to aid the selection of potential development sites in Australia, Hong Kong, Philippines, Thailand, Sri Lanka and China. Included development of selection criteria (e.g. results from community consultation, biodiversity status, land use, project requirements, conservations principles such as connectivity, fragmentation, island theory, edge effects, potential for restoration).

Aquatic Studies

Conducted wide range of aquatic studies, including fish, macro-invertebrates, aquatic and intertidal vegetation (saltmarsh, mangroves); Wetland creation and management projects and aquatic impact assessments.

Statements of evidence and expert testimony

Dr David Robertson is a highly experienced and credible expert witness and is capable of providing expert evidence in both terrestrial and aquatic areas of ecology. David has provided expert evidence for Australian Senate Select Committees, Australian Heritage Commission, Commissions of Inquiry, Land and Environment Court hearings and at Mining Wardens inquiries.

Professional Affiliations

- Ecological Society of Australia
- EIANZ
- CEnvP

