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Adam Smith
APP
Level 7, 116 Miller Street,
NORTH SYDNEY, NSW 2060

18 March 2021

Reference: 0585704

Dear Adam,

Subject: **Species Impact Statement (SIS) Peer Review – Kings Hill Development on 3221 Pacific Highway and 35 Six Mile Road, Kings Hill**

Dr David Dique of Environmental Resources Management Australia Pty Ltd ('**ERM**') writes to PM No. 1 Pty Ltd to document the outcomes of an independent peer review of the Kings Hill Development ('**KHD**') Species Impact Statement ('**SIS**') prepared by RPS (2020).

David is a Principal Ecologist that has held state government and private consultancy roles throughout his career. From an academic and research background, David has a detailed understanding of principles that underpin biodiversity research, survey and assessment, management, rehabilitation and conservation across a variety of landscapes and habitats throughout NSW and Qld. Over the last 20 years, David has become recognised as a specialist in koala ecology, research, conservation and management planning. A copy of David's curriculum vitae is provided in Attachment A.

This independent peer review considered the adequacy of the SIS and conclusions drawn in the Assessments of Significance. Specially, the Concept Proposal, including proposed avoidance and mitigation measures, have been considered in forming a view on the adequacy of the SIS and whether there is likely to be significant impact to listed threatened species known or with a high/moderate likelihood of occurrence in the subject site. The review also considered information available through the 2020 Port Stephens Koala Population Study (WWF, 2020), technical and legal memo advice provided by the proponent and a single day site visit.

The following points highlight the outcomes of this review:

- I note the substantial amount of data presented in the SIS that has been used to describe the specific values of the subject site for each species. The data has been obtained from detailed field surveys (by suitably qualified ecologists and species specialists) and generally in accordance with regulator survey guideline and CER requirements. Indeed, the data provides insight into the values of the subject site for protected species not typically observed for similar proposals of this scale and nature.

- The SIS describes a suite of avoidance and mitigation measures that are proposed as part of the Concept Proposal. Of critical importance is the protection in perpetuity of habitat within the Conservation Area, together with habitat quality enhancements and connectivity initiatives that are integral to the Concept Proposal and support the conclusions drawn in the SIS. Indeed, the proposed "local solution" aims to balance the needs of the Concept Proposal with species protection within the bounds of the project area aligned with requirements of the 7-part test

- The SIS defines the extent of habitat removal of up to 212.14 ha for some species. This quantum of impact would ordinarily lead to a conclusion of a significant impact. However, I have considered the local avoidance and mitigation measures that are integral to the Concept Proposal as part of my review and the positive impacts that may result from implementation of such measures. In particular, one of the avoidance and mitigation measures proposed is the site preparation sequence where clearing is to be over a period of 8+ years and managed by a vegetation management plan is important for minimising impacts to fauna.
- I have reviewed the detail associated with the assessment of significance for 11 species identified with "moderate" likelihood of occurrence to be present on the subject site. The risk presented to these species as a result of the Concept Proposal is low, and together with the proposed avoidance and mitigation measures, I am satisfied that there will not be a significant impact to these species as a result of the Concept Proposal;
- For those species categorised as "known" and "likely" to occur within the subject site, I have further reviewed the detail associated with the assessment of significance for each of the 24 species. In doing so, I have made a comparative analysis of impacts associated with the original concept (ie not inclusive of the key avoidance and mitigation measures as presented as part of the Concept Proposal), and the potential impacts associated with the Concept Proposal inclusive of avoidance and mitigation measures. I am satisfied that the conclusions drawn and presented in the SIS that there will be no significant impact to the subject species is based on a foundation of adequately collected data and knowledge of the values at the subject site together with well-defined and considered avoidance and mitigation measures.

The outcomes of this peer review is presented with the following structure:

- Proposed Development: this section provides a summary of the Concept Proposal including a brief description of the key avoidance and management measures that is integral to delivering conservation outcomes associated with the proposed development;
- Subject Species: a description of those species that have been considered in the SIS;
- Outcomes of Assessments of Significance: a comparative analysis of findings of the peer review of the SIS and conclusions associated with an evaluation of the outcomes of Assessment of Significance for the subject species.

1. PROPOSED DEVELOPMENT

1.1 Summary of the Concept Proposal

In 2002, the subject site was identified as being a major residential release area and was rezoned in 2010 by Port Stephens Council for the development of approximately 3,500 residential dwellings. It should be noted that the land of the Development Application relates to land owned by KHD who owns approximately 64% of land in the Urban Release Area ('**URA**').

The Development Application was submitted to Port Stephens Council ('**Council**') on 23 November 2018 (DA 16-2018-772-1). Following a request from Council for improved plans and additional information relating to the ecology assessment, the proposed development was amended and resubmitted in May 2019.

The application was then further revised and RPS presented a final SIS, dated July 2020, to address matters raised as part of public consultation and Council's ongoing assessment, the changes made provided more evidence and details on the environmental management measures proposed by KHD (RPS, 2020).

The Concept Proposal involves a residential subdivision, including seven Residential Precincts, Town Centre, Mixed Use Precinct as well as integrated stormwater and bushfire strategies. These urban precincts will include infrastructure and services such as water supply, roads, sewer, stormwater and recreation areas. It should be noted that the Concept Proposal has an indicative yield of 1,900 residential lots. Any land not identified for urban development is to form part of the Environmental Conservation Area.

The Concept Proposal also includes the clearing of land within identified residential sectors, the establishment of environmental protection measures and vegetation enhancement works within the Environmental Conservation Areas. It should be noted that a total of 212.14 ha of native vegetation comprising habitat recognised as of value to listed threatened species and 59.87 ha of cleared lands will be progressively impacted upon (in stages) by the Concept Proposal over an 8+ year timeframe

As part of the Development Application process, the preparation of a SIS from 2018 through to finalisation in 2020 has assisted in providing an improved understanding of biodiversity values and potential impacts associated with the Concept Proposal. Importantly, documented within the SIS are important avoidance and mitigation measures such that the original developable area of the subject site has been substantially reduced. This in turn increased the proposed Conservation Area from 39.8% to 47.2% of the subject site. To illustrate this key aspect of avoiding/managing potential impacts to listed threatened species, figures of the zone based and updated Concept Proposal is provided in Figure 1-1 and Figure 1-2 respectively.

Notably, the subject site contains vegetation that is connected to larger areas of vegetation outside of the subject site, with some associated with the conservation network.

Legend

- Subject Site
- Study Area
- Cadastre

Port Stephens Local Environmental Plan 2013

- B2 Local Centre
- B4 Mixed Use
- E2 Environmental Conservation
- E3 Environmental Management
- R1 General Residential
- R2 Low Density Residential
- RE1 Public Recreation
- RU1 Primary Production
- RU2 Rural Landscape
- SP1 Special Activities
- SP2 Infrastructure
- W1 Natural Waterways

N

SIX MILE ROAD
WINSTON ROAD
NEWLINE ROAD
SEAHAM ROAD
NOBLES ROAD
REES JAMES ROAD
RANGERS ROAD
DAIRYMAN DRIVE
ROSIE ROAD
PACIFIC HIGHWAY

Disused Waste Management Facility (capped Council Tip)

Current Waste Management Facility

RU1 RU2 E3 R1 SP2 B4 E2 B2 RE1 W1 SP1 R2

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200 100 0 200 400 600 800 1,000 m

SCALE: 1:20,000 AT A3 SIZE

TITLE : FIGURE 1.2: LAND ZONING OF THE STUDY AREA

LOCATION : KINGS HILL

DATUM:GDA 1994

PROJECTION: GDA 1994 MGA Zone 56

DATE : **23/07/2020**

PURPOSE: **ECOLOGY**

VERSION (PLAN BY): D A3 (Natalie.Wood)

PATH: J:\JOBS\130k\130430 Raymond Terrace\10 - Drafting\Arcgis Map Documents\Eco\Report\3. SIS\20200719 SIS Final Version\130430 Figure 1.2 Land Zoning of the study area D A3 20200719.mxd

CLIENT: **PM NO 1 PTY LIMITED**

JOB REF: **PR130430**

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MAKING COMPLEX EASY

Legend

- Subject Site
- Proposal Footprint
- Conservation
- Indicative Water Reservoir Location
- Phase 1
- Phase 2
- Phase 3

N

SIX MILE ROAD

WINSTON ROAD

NEWLINE ROAD

PACIFIC HIGHWAY

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200 100 0 200 400 600 800 1,000 m

SCALE: 1:14,000 AT A3 SIZE

TITLE : FIGURE 2.6: SITE PREPARATION SEQUENCE

LOCATION : KINGS HILL

DATUM:GDA 1994

PROJECTION: GDA 1994 MGA Zone 56

DATE : **23/07/2020**

PURPOSE: **ECOLOGY**

VERSION (PLAN BY): B A3 (Natalie.Wood)

PATH: J:\JOBS\130k\130430 Raymond Terrace\10 - Drafting\Arcgis Map Documents\Eco\Report\3. SIS\20200719 SIS Final Version\130430 Figure 2.6 Site Preparation Sequence B A3 20200719.mxd

CLIENT: **PM NO 1 PTY LIMITED**

JOB REF: **PR130430**

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MAKING COMPLEX EASY

1.2 Key Avoidance and Mitigation Measures of the Concept Proposal

The SIS prepared by RPS (2020) provides a description of key avoidance and mitigation measures of the Concept Proposal. The SIS argues that the measures will enhance and protect important ecological areas, and allow the environment and listed threatened species affected by the Concept Proposal to transition away from or adjust to the impacts associated with vegetation disturbance and clearing. To ensure conservation objectives are met and not compromised by the proposed urban development, specific avoidance, restoration, mitigation and conservation measures have been described and incorporated into the proposed Concept Proposal.

This is an important concept, as the proposed avoidance and mitigation measures are integral to the overall Concept Proposal, and therefore must be considered in assessing the potential impacts to listed threatened species known or likely to occur within the subject site. As stated previously, the Concept Proposal has substantially reduced the original developable area of the subject site and increased the proposed Conservation Area from 39.8% to 47.2% of the subject site. This represents an 18.6% increase in land available for listed threatened species that would not have otherwise been available in the original proposal, and will be protected in perpetuity.

A second important aspect of the avoidance and mitigation measures is the staging of the Concept Proposal, such that clearing of vegetation will occur across a minimum of 8 years. This provides opportunities to work closely with ecology specialists to allow for listed threatened species to move across the subject site, and provide adequate time for species to adjust to the changes occurring across the subject site. The staging combines early conservation protection measures (such as habitat protection, koala proof fencing), together with habitat restoration and enhancement works (such as revegetation, microhabitat placement) while staging vegetation clearing activities. Importantly, the changes are proposed to occur across an 8+ year timeframe, and not at immediate approval, should a DA be granted.

Finally, the Concept Proposal also includes mitigation measures aimed at improving habitat for listed species through a series of important habitat enhancement initiatives, providing benefit to a range of species. Table 1-1 is a summary of the proposed mitigation measures located in the SIS. Additional detail can be found in the SIS (RPS, 2020).

Table 1-1 Summary of Proposed Mitigation Measures

Impacts	Proposed Mitigation Measures
Impact avoidance	■ Avoid area with high foliage nutrient value for the Koala and area actively used by the Koala including breeding female activity ■ Substantially increase patch integrity by limiting edge to area ratio ■ Avoid area with high hollow-bearing tree density ■ Avoid the majority of habitat occupied by *Corybas dowlingiiI*.
Habitat retention and protection	■ Establishment of conservation area ■ In-perpetuity conservation mechanism
Site preparation sequence	■ Revegetation of currently cleared treeless lands surrounding proposed Wetland 803

Impacts	Proposed Mitigation Measures
	■ Installation of natural and artificial hollows for hollow dependent species ■ Emplacement of logs to improve ground habitat complexity for small mammals ■ Weed management to improve vegetation structure, floristic composition and natural regeneration potential
Stormwater management	■ Inclusion of bio-filtration basins with a combination of Gross Pollutant Traps. ■ Rain water tanks have been included into the design ■ To prevent flows from minor events, a splitter pit will be installed immediately upstream of the bioretention basin.
Vegetation clearing sequencing and procedure	■ Three steps have been defined to deliver a sequenced clearing outcome and they are: - Step 1: Exotic flora removal - Step 2: Partial vegetation removal - Step 3: Complete vegetation removal.
Water reservoirs	■ An allowance of 0.6 ha is provided for the clearing of native vegetation at the two proposed water reservoirs ■ If the location is amended any vegetation clearing would be 'like for like' in area and vegetation type.
Koala Fence, Gates and Grids	■ The interface between the urban use and conservation area is to be characterised by a Koala proof fence with furniture specifications for cultures and Koala bridges and grids ■ The fence is to be readily visible from the perimeter roadside environment and constructed to allow access or recreational uses and biodiversity management.

2. SUBJECT SPECIES

To determine the subject species requiring further assessment in the SIS, information obtained from database analysis and review of current literature for records of threatened species occurring within the locality were examined for the likelihood of occurrence of those species with potential to occur within the subject site (RPS, 2020). As such, from the database analysis and review of literature a total of 75 threatened species were identified (25 threatened flora and 50 threatened fauna) to potentially occur on the subject site. A total of 35 species were identified for further assessment as part of the SIS, and noted as subject species. These species were categorised as either moderate, high or known (RPS, 2020) based on information obtained for each species for the following:

- Habitat descriptions provided in the Threatened Species Profile Database;
- The currency of threatened species observations and proximity to the subject site;

- The result of targeted surveys undertaken on multiple occasions, and by multiple specialists across the subject site; and
- The effects of existing key threatening processes.

Section 4 of the SIS presents further information on individual subject species and how the likelihood of occurrence was assessed (RPS, 2020). The likelihood of occurrence conclusions are the result of a conservative assessment, where those species with a moderate likelihood of occurrence are assessed within the SIS.

Table 2-1 below presents the 35 subject species either known to occur or have a high or moderate likelihood of occurrence as assessed within the SIS.

Table 2-1 Subject Species

Subject Species	Likelihood of Occurrence
Flora	
Corybas dowlingii Red Helmet Orchid	Known
Maundia triglochinoides Small Water-ribbons	Known
Pterostylis chaetophora Taree Rustyhood Orchid	Known
Fauna	
Calyptorhynchus lathami Glossy-black Cockatoo	Known
Climacteris picumnus victoriae Brown Treecreeper	Known
Daphoenositta chrysoptera Varied Sittella	Known
Glossopsitta pusilla Little Lorikeet	Known
Pomatostomus temporalis temporalis Grey-crowned Babbler	Known
Haliaeetus leucogaster White-bellied Sea-Eagle	Known
Lophoictinia isura Square-tailed Kite	Moderate
Pandion cristatus Osprey	Known
Anseranas semipalmata Magpie Goose	Moderate
Botaurus poiciloptilus Australasian Bittern	Moderate
Ixobrychus flavicollis Black Bittern	Moderate
Artamus cyanopterus cyanopterus	Known

Subject Species	Likelihood of Occurrence
Dusky Woodswallow	
Ephippiorhynchus asiaticus Black-necked Stork	Moderate
Ninox strenua Powerful Owl	Known
Tyto novaehollandiae Masked Owl	High
Anthochaera phrygia Regent Honeyeater	Moderate
Lathamus discolor Swift Parrot	Moderate
Petroica boodang Scarlet Robin	Known
Petaurus norfolcensis Squirrel Glider	Moderate
Phascolarctos cinereus Koala	Known
Phascogale tapoatafa Brush-tailed Phascogale	Known
Dasyurus maculatus Spotted-tail Quoll	High
Pteropus poliocephalus Grey-headed Flying-fox	Known
Mormopterus norfolkensis Eastern Freetail-bat	Known
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	Known
Miniopterus australis Little Bentwing-bat	Known
Falsistrellus tasmaniensis Eastern False Pipistrelle	Moderate
Scoteanax rueppellii Greater Broad-nosed Bat	High
Saccolaimus flaviventris Yellow-bellied Sheath-tail Bat	High
Myotis macropus Southern Myotis	High
Litoria aurea Green and Golden Bell Frog	Moderate
Crinia tinnula Wallum Froglet	Moderate

3. OUTCOMES OF ASSESSMENTS OF SIGNIFICANCE

A review of the SIS and associated seven part tests was undertaken for the known and high species identified in Table 2-1. Specific consideration was given to the avoidance and mitigation measures that are integral to the Concept Proposal in evaluating the Assessments of Significance as detailed in the SIS.

For those subject species considered to have a moderate likelihood of occurrence within the subject site, I have formed the opinion that:

- The risk presented to these species as a result of the Concept Proposal is low given that some species may occur within small parts of the subject site (for example migratory species that may only occur in the wetland in the western part of the subject site);
- Records of the presence of “moderate” species in the Locality are rare or not current, and despite considerable targeted field surveys across multiple visits and by multiple specialists, there remains little evidence of species presence;
- Despite the considerable field survey effort, the “moderate” species were assessed in the SIS and the outcomes of assessments of significance presented; and
- Given the conservative nature of the assessments, I support the conclusions that there is unlikely to be significant impacts to those “moderate” species assessed and included in the SIS.

For those species categorised as known and likely to occur within the subject site, I have further reviewed the detail associated with the assessment of significance for each of the 24 species and summarised my findings in Table 3-1. In doing so, I have provided a summary of the disturbance and displacement for each subject species as a result of the original concept (ie not inclusive of the key avoidance and mitigation measures as presented as part of the Concept Proposal), the potential impacts associated with the Concept Proposal inclusive of avoidance and mitigation measures, the importance of the Conservation Area for each subject species and the potential impacts as is presented in the SIS. My findings for each subject species is in the last column of Table 3-1, and considers species specific habitat requirements, potential species specific impacts associated with the Concept Proposal (inclusive of key avoidance and mitigation measures) and my opinion on the adequacy of the assessments of significance in accordance with the criteria of the seven-part tests.

It is important to note, that for some of these species, without mitigation, the extent of quantified habitat removal of up to 212.14 ha would ordinarily lead to a conclusion of a significant impact. However, I have considered the avoidance and mitigation measures that are integral to the Concept Proposal as part of my review and the positive impacts that may result. Indeed, where possible, I have used the information contained within the SIS and additional studies undertaken by specialists to support quantification of the positive impacts, as part of determining the overall level of significance of impact for each subject species.

Table 3-1 Evaluation of SIS

Subject Species	Zone Based Impact	KHD's Proposed Concept Plan with Avoidance and Mitigation	SIS Potential Impact	Summary of Review/Findings
Red Helmet Orchid	■ A count of 1,585 individual plants were recorded within the subject site, with 118 individuals in the impact area and 1,467 individuals occurring within the proposed Conservation Area.	■ Approximately 118 plants displaced ■ 7.5% reduction in population and 92.% of the population conserved	■ Species will not become fragmented or isolated ■ The number of individuals displaced will not adversely affect the total number of individuals known nor alter the distribution of the species ■ Species will be managed via an in-perpetuity conservation agreement	■ Agree with SIS conclusion - The enhanced corridor connections (Conservation Area) are of sufficient dimensions to act as habitat and will not fragment or isolate the habitat of this species - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Small Water-ribbons	■ Observed in an unmanaged and constructed inline dam near the mid reach of an ephemeral creek outside the floodplain ■ Also observed in inline dams located in the Conservation Area within / adjacent to the floodplain	■ Approximately 40% of population displaced (0.08 ha) ■ The Conservation Area comprises 0.15 ha of habitat that is to be conserved	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS Conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality -
Taree Rustyhood Orchid	■ Species occurs in small low number clusters within the area to be cleared, with an individual count of approximately 20 ■ Approximately 460 individuals were observed within the Conservation Area	■ Up to 20 individuals displaced ■ 0.85 ha of habitat disturbed ■ 4.36 ha, approximately 460 individuals conserved	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The enhanced corridor connections (Conservation Area) are of sufficient dimensions to act as habitat and will not fragment or isolate the habitat of this species
Glossy-black Cockatoo	■ 29.83 ha of foraging habitat to be disturbed	■ No breeding habitat is to be removed as part of the Concept Proposal.	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained foraging habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality. No breeding habitat will be impacted - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Brown Treecreeper	■ Removal of 206.64 ha of habitat	■ Removal of 206.64 ha of habitat ■ Conservation area conserving 214.07 ha of habitat	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Varied Sittella	■ Removal of 212.14 ha of habitat	■ Approximately 38.47 ha of avoided foraging/breeding habitat ■ Conservation Area comprises of 214.07 ha of foraging/breeding habitat	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species

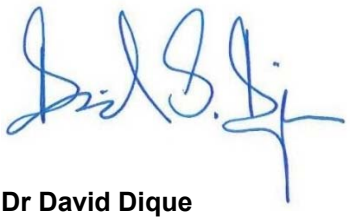
Subject Species	Zone Based Impact	KHD's Proposed Concept Plan with Avoidance and Mitigation	SIS Potential Impact	Summary of Review/Findings
				- Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Little Lorikeet	■ Removal of 212.14 ha of habitat	■ Approximately 38.47 ha of avoided foraging/breeding habitat ■ Conservation Area comprises of 214.07 ha of foraging/breeding habitat	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Grey-crowned Babbler	■ Species observed around a wetland in the Conservation Area and in vegetation dominated by Forest Redgum north of the wetland and in the western part of the area to be cleared ■ Removal of 32.21 ha of habitat	■ Conversation Area comprises 12.44 of like for like habitat area ■ Revegetated area of 9.40 ha adjacent to Conservation Area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
White-bellied Sea-Eagle	■ Removal of 9.68 ha of habitat	■ Conservation Area comprises 9.99 ha breeding habitat	■ Species will be managed via an in-perpetuity conservation agreement ■ Cleared lands located in close proximity to nest trees will be revegetated	■ Agree with SIS conclusion - Conserved breeding habitat within the Conservation Area - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Osprey	■ No removal of habitat for this species	■ Conservation Area comprises approximately 14.85 of potential habitat	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - no removal of habitat is proposed - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Dusky Woodswallow	■ Species observed on occasion within the subject site flying over a wetland in the Conservation Area ■ 212.14 ha of habitat disturbed	■ Conservation Area comprises 219.56 ha of like for like habitat ■ Approximately 7.5 ha of increase in Conservation Area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species

Subject Species	Zone Based Impact	KHD's Proposed Concept Plan with Avoidance and Mitigation	SIS Potential Impact	Summary of Review/Findings
Powerful Owl	■ The species is observed on occasion on the site in the Conservation Area and area to be cleared ■ 206.64 of habitat disturbed	■ Increase in Conservation Area of approximately 10 ha ■ Conservation Area of 216.49 ha	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Masked Owl	■ Observed once within the site in the Conservation Area ■ 206.64 ha habitat disturbed	■ 38.47 ha foraging/breeding habitat avoided ■ Conservation Area comprises 216.49 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Scarlet Robin	■ Rarely identified on site with observation mostly in the Conservation Area ■ 206.64 ha habitat disturbed	■ 38.47 ha of occupied habitat avoided ■ Conservation Area comprises 214.07 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS Conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Koala	■ 152 ha of Koala habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 189.46 ha like for like area ■ Revegetation of 9.4 ha adjacent to Conservation Area	■ Species will be managed via an in-perpetuity conservation agreement ■ Construction of Koala fence, road grids, and bridges ■ Feral dog management	■ Agree with SIS conclusion - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Habitat enhancement will improve carrying capacity of koala population within the subject site and connectivity to surrounding habitat. The occurrence of signs of koalas in the subject site is low, and likely that in the order of 10 individuals resides in the subject site, so improved carrying capacity resulting from enhancement works will manage the impact of loss of habitat

Subject Species	Zone Based Impact	KHD's Proposed Concept Plan with Avoidance and Mitigation	SIS Potential Impact	Summary of Review/Findings
				- Importantly, the koala population is connected to the genetic population located to the west of the Pacific Highway, and is regarded as being more genetically diverse - Fragmentation is not increased with the Concept Proposal, indeed there are more protected corridors allowing for safe movement
Brush-tailed Phascogale	■ Occurs through site in low densities, with higher activities in dense hollow-bearing trees and mature forest with rough-barked trees ■ 206.60 ha of potential habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 216.49 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Given the mobility of the species and movement created throughout the locality via corridors in the Conservation Area, and higher quality habitat occurs within the Conservation Area - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally
Spotted-tail Quoll	■ 206.60 ha habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 216.49 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Given the mobility of the species and movement created throughout the locality via corridors in the Conservation Area, and higher quality habitat occurs within the Conservation Area - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally
Grey-headed Flying-fox	■ Periodically observed within subject site ■ 212.14 ha of foraging habitat disturbed	■ 38.47 ha of foraging habitat avoided ■ Conversation Area comprises 216.49 ha like for like area ■ Revegetation of 19.4 ha of high value winter – spring nectar producing eucalypts	■ Revegetation works to provide a source of high value food during the bottleneck feeding period ■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat removed will not have adverse impacts on the long-term survival of the species
Eastern Freetail-bat	■ Foraging and roosting habitat is widespread throughout the site ■ 47.94 ha habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 101.66 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat retained will support the long-term survival of the species

Subject Species	Zone Based Impact	KHD's Proposed Concept Plan with Avoidance and Mitigation	SIS Potential Impact	Summary of Review/Findings
Eastern Bentwing-bat	■ Foraging habitat is widespread throughout the site ■ 212.14 ha habitat disturbed	■ 38.47 ha of foraging habitat avoided ■ Conversation Area comprises 216.49 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally
Little Bentwing-bat	■ Foraging habitat is widespread throughout the site ■ 212.14 ha habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 216.49 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally
Greater Broad-nosed Bat	■ Foraging and roosting habitat is widespread throughout the site ■ 47.94 ha habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 101.66 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat retained will support the long-term survival of the species
Yellow-bellied Sheath-tail Bat	■ 164.20 ha habitat disturbed	■ 38.47 ha of foraging/breeding habitat avoided ■ Conversation Area comprises 112.41 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat retained will support the long-term survival of the species
Southern Myotis	■ 11.58 potential breeding habitat disturbed	■ Conversation Area comprises 21.65 ha like for like area	■ Species will be managed via an in-perpetuity conservation agreement ■ Habitat area protected is considered sufficiently large and appropriate to allow for sustained use over time	■ Agree with SIS conclusion - Retained habitat is to be modified to improve habitat conditions for the species and will therefore not impact on habitat quality - The Concept Proposal incorporates enhanced wildlife movement corridors within the Conservation Area and the corridors are of sufficient dimensions to act as habitat and will therefore not fragment or isolate the species locally or regionally - Given the in-perpetuity protection and management of the Conservation Area is to maintain the local viable population of the species, it is considered that the habitat retained will support the long-term survival of the species

Yours sincerely,



Dr David Dique
Partner

ATTACHMENT A DR DAVID DIQUE'S CV

David Dique

Partner

David is a Principal Ecologist that has held state government and private consultancy roles throughout his career. From an academic and research background, David has a detailed understanding of principles that underpin biodiversity research, survey and assessment, management, rehabilitation and conservation. This, coupled with experience in biodiversity conservation planning and policy development from state government, has enabled David to provide high level strategic approvals advice for major projects in the resources and infrastructure sectors. David's terrestrial biodiversity experience covers a wide range of landscapes, habitats and species from the southern highlands of NSW to Cape York in Qld.

Over the last 25 years, David has become recognised as a specialist in koala ecology, research, conservation and management planning. David completed his PhD on koalas in South-east Queensland in 2004, and since then has played key roles on expert panels for State and Federal Governments in koala management policy development. This includes developing the Queensland koala habitat mapping, participation as an invited expert on a panel for the review of the status of koalas in Australia and contributing as an invited expert for the development the EPBC Act koala referral guidelines.

Experience: 25 yrs experience: public and private sector roles (inc. extensive publication record)

Koala Expert Panel Member

- National review of status of koalas, 2012
- Input to development of EPBC Act Referral Guideline for the Vulnerable Koala, 2013
- Contributor to Qld Expert Panel Report, 2017
- Lead for Qld Government SEQ koala habitat mapping, 2009

Email: David.Dique@erm.com

Education

- 2004 – Doctor of Philosophy: University of Queensland, Brisbane Qld
- 1994 – Bachelor of Natural Resources (Hons 1): UNE, Armidale NSW
- 2014 – EIANZ Certified Environmental Practitioner (Ecology Specialist)
- Department of Environment (DoE) Suitably qualified ecologist

Languages

- English, native speaker

Fields of Competence

- Koala ecology and conservation planning
- Ecological survey design and assessment
- Biodiversity impact assessment
- Biodiversity policy and legislation
- Threatened Species habitat mapping
- Biodiversity Offsets
- State and Federal strategic approvals
- EPBC referral and MNES reporting
- Rehabilitation Management
- Contract Management
- Major project delivery
- Environmental due diligence
- EA compliance and auditing
- IFC and World Bank Biodiversity assessments

Key Industry Sectors

- Government
- Infrastructure
- Oil & Gas
- Mining

Key Projects

Koala

- Project Director for review and submissions for appointment of technical specialist to implement a Koala Management Program for Cooroy to Curra (Stage D) Bruce Highway Upgrade Project, DTMR
- Project Director for SEQ Koala Habitat Mapping Project extending from Noosa to the Gold Coast covering 700,000 ha of bushland, DEHP
- Project Director for approvals documentation for K2ARB section of Inland Rail (includes koala impact assessment and management), ARTC
- Project Director and Project Manager for two Koala Survey and Habitat Mapping projects across several local government areas in SEQ
- Project Director for Brisbane Valley Highway koala assessment and habitat mapping, Esk, DTMR
- Project Director for koala surveys, impact assessment and ecology baseline reporting for Bruce Highway Upgrade Cooroy to Curra (Stage D), DTMR
- Project Director for koala and ecology assessments for feasibility assessment for Dedicated Freight Rail Corridor (section of the Inland Rail Project), Toowoomba to Brisbane, Port of Brisbane
- Project Director for ecology assessment (inc. advice on koala offsets) for Bruce Highway Upgrade Cooroy to Curra (Stage A) EIS, DTMR
- Project Manager for koala survey and assessment at a proposed industrial development site at Pimpama, Gold Coast, DTMR
- Technical lead for EPBC Act referral preparation and regulator liaison, specialist advice on impacts to koalas, Pacific Highway upgrade, RLMS, Kempsey
- Project Director for koala surveys and habitat mapping on Stradbroke Island, RCC
- Project Manager for koala assessment and ecological assessment for proposed Gap Creek Road and Redland Bay Rd upgrades, SEQ, BCC
- Project Director for several koala assessments in SEQ to meet State and Federal referral/offsetting requirements, SEQ, DTMR, DHPW, Earthtrade
- Project Director for koala habitat mapping and offsetting advice for Anya, QCLNG Project, QGC
- Project Director for SEQ Water Grid vegetation offsets. Secured 1000 ha offset for 19 Development Applications, WCRWP
- Project Manager flora/fauna surveys and preparation of REF for Town Water Supply pipelines (50km) as part of the Western Corridor Recycled Water Pipeline project, including koala offsetting

Other Relevant Projects

- Technical Lead Ecology for windfarm ecological assessments as part of the EIS for three confidential windfarm projects in NSW, Wind Prospects
- Technical lead for Alpha Rail EIS, ecology, for a 500km proposed rail alignment, strategic approvals advice for the Alpha mine and rail component of the project through federal approvals process, Hancock/GVK, Alpha
- Technical lead for Carmichael Coal mine, ecology and threatened species management and strategic approvals advice for mine and rail for Carmichael Coal Mine, Adani, Galilee Basin
- Project Director for EPBC Act referral preparation, provision of strategic approvals advice and ecological assessment for 250km pipeline from Moranbah to Alpha, Sunwater
- Project Director for pre-clearance surveys and threatened species surveys for 420km gas pipeline, Santos GLNG, Roma to Gladstone
- Project Director for Rehabilitation Management Plan and analogue site assessment for 420km gas pipeline, Santos GLNG, Roma to Gladstone
- Project Director for ATP 852 gas field expansion, EA amendment, QCLNG Project
- Project Director for Confidential gas field project EA amendment, Western Surat Basin, Senex Energy
- Project Director for Third Party Environmental Compliance Audits of APLNG, GLNG, QCLNG, Surat Basin
- Project Director for analogue site identification, assessment and preparation of rehabilitation

plans for gas fields and pipeline for QGC, QCLNG, Surat Basin

- Project Director for the development of the QCLNG Project offset plan under State and Commonwealth statutory approvals, QGC Surat Basin
- Project Director for MNES reporting and Referral preparation for expansion of operations in Spring Gully, APLNG, Surat Basin
- Project Director for a variety of Tier 2 approvals and permits (e.g. water way barrier works, vegetation clearing permits) for Origin and QGC, APLNG and QCLNG, Surat Basin
- Project Director for Wildlife Management Plan, pipeline construction team, QGC, QCLNG, Roma
- Project Director for Teresa Coal Mine EIS and strategic approvals advice, Linc Energy, Emerald
- Technical lead for flora/fauna surveys, threatened species management and strategic approvals advice for Aurukun Bauxite Mine EIS, Chalco, Cape York,