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7 December 2020

Steven Cox
Senior Team Leader Planning
Biodiversity Conservation Division
Department of Planning, Industry and Environment
Level 4/26 Honeysuckle Drive
Newcastle NSW 2300

Dear Steven,

BIODIVERSITY STRATEGY - PLANNING PROPOSAL FOR DOYALSON WYEE RSL CLUB

Central Coast Council and Doyalson Wyee RSL (the proponent) met with Biodiversity Conservation Division (BCD) on 3 November 2020 to discuss the biodiversity strategy proposed for the Planning Proposal for Doyalson Wyee RSL Club located on 49-65 Wentworth Avenue and 80-120 Pacific Highway, Doyalson.

Consultation with BCD is required by the Gateway Determination issued by NSW Department of Planning, Industry and Environment (DPIE) on 12 October 2020.

In the meeting, BCD requested a submission addressing how the proposed biodiversity connectivity corridors are responding to regional biodiversity connectivity and the objectives outlined in the following Plans/Strategy:

- North Wyong Structure Plan
- Central Coast Regional Plan
- Draft Central Coast Biodiversity Strategy

1. BACKGROUND

A Biodiversity Assessment was undertaken by Eco Logical Australia Pty Ltd (June 2019) and was prepared based on **2 years** of fields surveys of the study area since 2017. Resulting in a compliant survey in accordance with the Biodiversity Assessment Methodology (BAM; OEH, 2017), including all associated surveys on threatened species.

Extensive consultation and workshop between Eco Logical, Urbis and Council were undertaken post Council's review of the Biodiversity assessment.

The project team consulted with Council in multiple occasions, in the form of email, teleconference and video conference and throughout **August to November 2019**. The Biodiversity Assessment was also **updated on three occasions** in 2019 to satisfy survey and Council's biodiversity investigation requirements.

In September 2019, Council requested:

> *"The southern portion of the proposal area contains known foraging habitat and potential breeding habitat for the vulnerable Glossy Black-Cockatoo. Incorporating an east-west green/wildlife corridor of a minimum width of 40 m that aims to retain breeding and foraging habitat for the species in the southern portion of the proposal area would demonstrate avoid and minimise principals and also reduce the species credit requirement for the proposal."*

In response to Council's request, Eco Logical prepared a letter outlining the assessment of the biodiversity corridors established under the indicative Concept Plan, as an alternative approach in lieu of establishing an east-west corridor.

A copy of the letter is attached at Appendix A.

The assessment concluded that:

- Glossy Black Cockatoo was identified during field surveys, and as such all suitable vegetation has been mapped as requiring 'species credits' should it be impacted at the DA stage. This species is highly mobile and does not require canopy connectivity to facilitate movement throughout the landscape.
- The entire site is fenced, or separated from areas of adjacent native vegetation. In particular, the western boundary of the site is separated from other areas of native vegetation, by a dual carriage way (Pacific Highway), which is likely impassable for many fauna species.
- Connectivity is currently limited within the study area and to other adjacent areas of remnant vegetation. Large gaps and fenced areas are prevalent on all sides of the study area. Some areas connected to adjacent vegetation will be retained along the eastern boundary of the proposed development.
- Connectivity cannot be strengthened across the Pacific Highway.
- The study area was not identified as part of a wildlife corridor in the Wyong Flora and Fauna Survey Guidelines.
- The Indicative Concept Plan will maintain (and likely improve) connectivity in the north of the study area, due to connection to the retained vegetation in the crown land parcel, as well as through retention of vegetation and planting in and around open space areas.
- All residual impacts of the proposal will be offset in accordance with the Biodiversity Offset Scheme at the DA stage.

Furthermore, the letter strongly advises against encouraging fauna crossing of the Pacific Highway, given the high risk of fatal animal strikes that are likely to result.

As an outcome of this assessment, the project team and Council has agreed not to adopt the east-west corridor. Alternative biodiversity corridors were incorporated as part of the Planning Proposal as discussed below.

2. PROPOSED BIODIVERSITY CONNECTIVITY CORRIDORS

As an agreed outcome of the extensive consultation with Central Coast Council (Council) and the assessment outlined above, the Proposal has developed a Biodiversity and Open Space Plan (refer to Figure 1), which considers the known biodiversity values including threatened species on the site.

The Plan proposes to distribute open and green space within the site and to establish a primary south-north biodiversity corridor and a secondary east-west corridor. The indicative Concept Plan was also informed by these corridors.

The applicant will work with Council on the most appropriate planning mechanism to implement the biodiversity outcome of the site (location and width of biodiversity corridors).

The Biodiversity and Open Space Plan includes:

- Reinstate a riparian corridor around the 2nd order stream in the north
- Proposal to increase vegetation and connectivity along the northern boundary (which is currently unvegetated)
- Planting and vegetation management along the western boundary, which is currently unmanaged.
- Planting and vegetation management in and around proposed open space uses within the north and east of the development area
- Retention and management of native vegetation along the eastern boundary
- Replanting along the periphery of the Jemena Gas Easement, where possible
- Retention of 17 hollow-bearing trees in a 0.76 ha central park open space
- Consideration of Glossy Black-cockatoo feed species for street tree planting (to be developed at DA Stage)

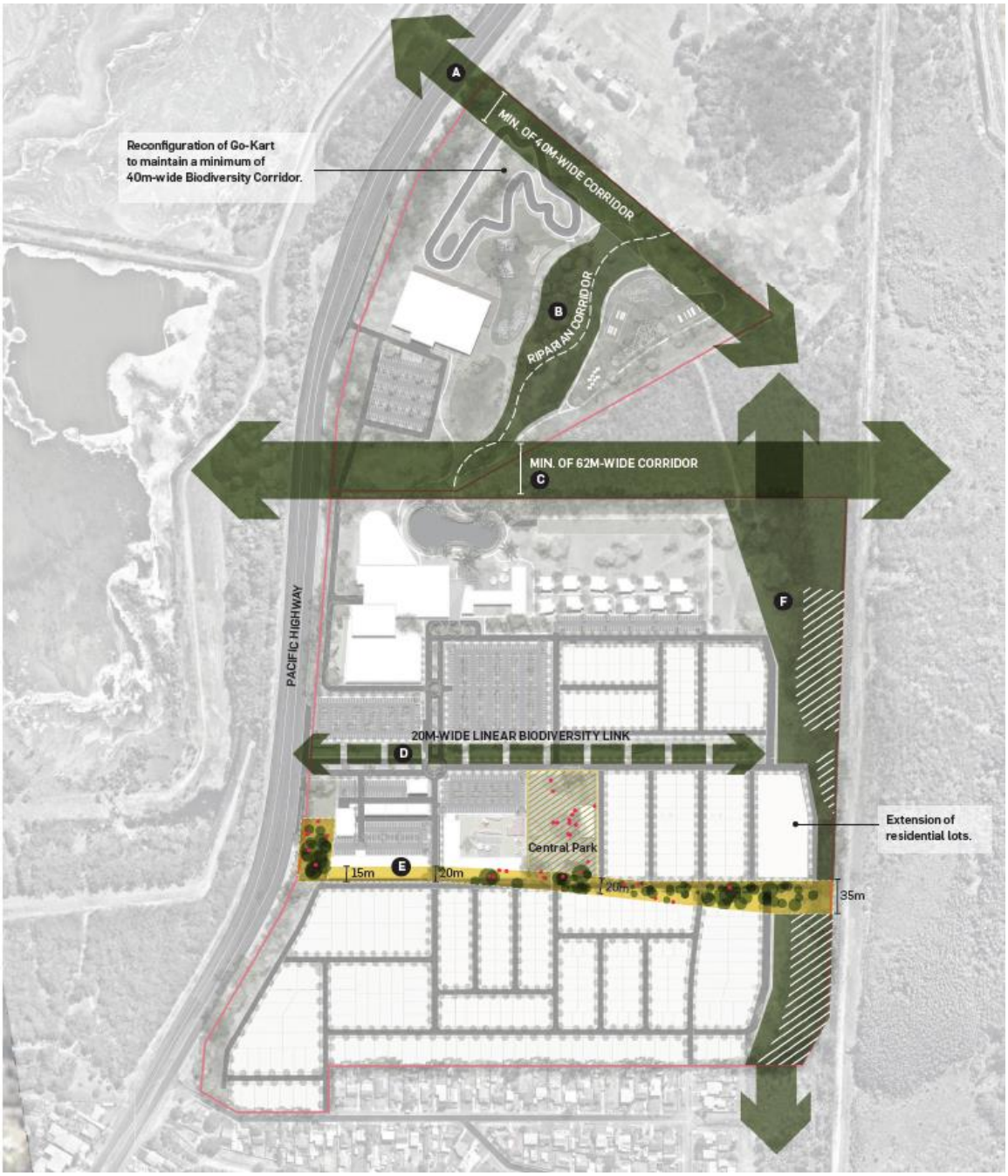
Overall, the development will:

- Result in the removal of 0.1ha (4%) of endangered ecological community (EEC), and the removal of 8.9ha (70%) of other native vegetation. This is a total of 9ha (58%).
- Retaining **90% of EEC (2.7ha)** and **30% of other native vegetation (3.9ha)**. This is a total of **6.6ha (42%)**.
- Of the retained vegetation, **36 hollow bearing trees (56%)** are retained within the open space (Central Park), road corridor and buffer zones (biodiversity corridor E).
- 4.3ha of native vegetation will be revegetated onsite, which forms part of the biodiversity corridors. The total area of retained vegetation and rehabilitated vegetation is **10.9ha**, which is more than the total area of removed vegetation (9ha).
- The removal of EEC and native vegetation has been assessed in accordance with the Biodiversity Assessment Method and the following mitigations have been incorporated to minimise biodiversity impact:
  - The biodiversity impact is offset off-site in accordance with BCAR.
  - The rehabilitation of native vegetation is a wholistic approach to rehabilitate biodiversity value onsite.

In addition to the 10.9ha of retained and rehabilitated vegetation, managed open space area and planted gas easement all contribute to the overall biodiversity value of the site and contribute to a number of biodiversity corridors.

The biodiversity and open space plan will result in improved biodiversity connectivity to the north of the site and aims to maintain and improve biodiversity connectivity to the south where possible. The secondary east-west green corridor is likely to provide steppingstones for locally known fauna species.

Figure 1 Biodiversity and Open Space Plan



Source: Urbis

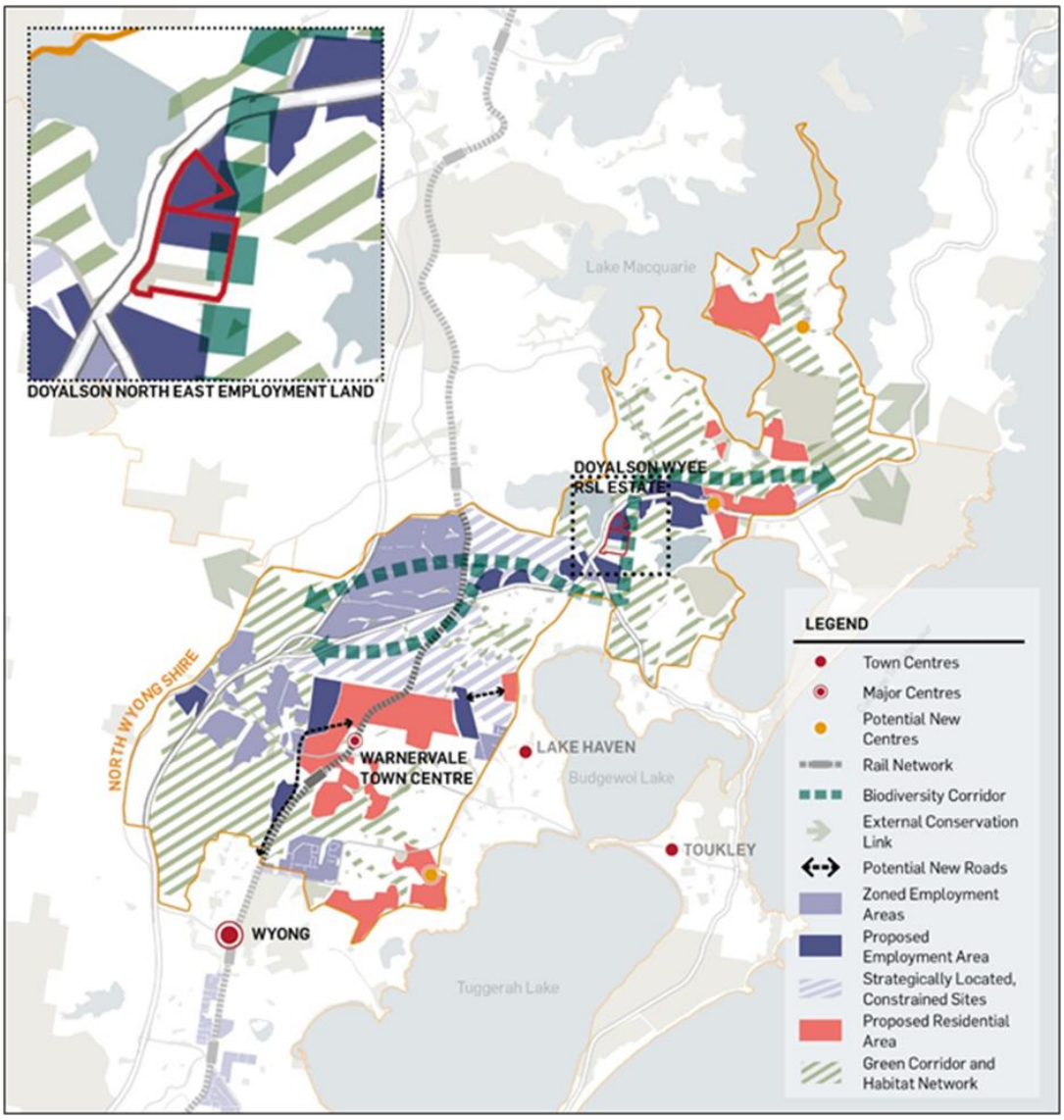
3. NORTH WYONG SHIRE STRUCTURE PLAN

The North Wyong Shire Structure Plan (NWSSP) was prepared by DPIE and adopted in October 2012.

The NWSSP identifies the majority of the Central Coast's new greenfield residential development and all of the region's greenfield employment development to 2031.

The site has been identified within Precinct 15 – Doyalson North East Employment (refer to Figure 2). A northern green corridor is located along the eastern boundary of the site.

Figure 2 North Wyong Shire Structure Plan



Source: Urbis

As outlined in Figure 1, the Planning Proposal proposes to establish a primary south-north biodiversity corridor. The proposed south-north corridor retains and manages native vegetation (including EECs) and the planting of new vegetation to integrate with open space area, which will contribute and strengthen the green corridor envisioned in the North Wyong Shire Structure Plan.

The proposal responds to the objectives of the North Wyong Shire green corridor as outlined below:

Table 1 North Wyong Shire Structure Plan Green Corridor

Objectives	**Response**
To improve the extent and condition of biodiversity in the region;	The proposed development will retain the existing vegetation within the identified Biodiversity Corridor. Within the site, the masterplan proposes to revegetate areas that are currently cleared to create new local links to vegetation outside to the site. The condition of retained vegetation (currently unmanaged) within the site will be improved through management under a Vegetation Management Plan.
To ensure connectivity for organisms at a landscape and regional scale;	The proposed development will retain the existing Biodiversity Corridor and create new local links that will maintain connectivity at a landscape scale. The proposed development will not affect connectivity of organisms at a regional scale.
To provide landscape permeability to improve long-term ecological resilience;	The current barrier to movement at a landscape scale is the existing Pacific Highway, which will not be altered under the proposed development. As described above, the proposed development will retain the existing Biodiversity Corridor and create new local links that will maintain connectivity at a landscape scale. The creation of additional links internally will improve permeability of avifauna locally.
To facilitate adaptation to climate change through the protection and conservation of areas which enable fauna migration and dispersal, and the dispersal of plants;	The impacts of climate change to biodiversity values locally will not be exacerbated by the proposed development.

Objectives	Response
	As described above, the proposed development will retain the existing Biodiversity Corridor and create new local links that will maintain connectivity at a landscape scale. Fauna migration and dispersal of plants will not be affected by the proposed development.
To maintain and enhance water flows, water quality, aquatic environments and groundwater dependent ecosystems;	The existing 2nd order stream onsite will be revegetated and managed under the proposed development, leading to a local gain in the condition of aquatic environments.
To protect and conserve Aboriginal cultural heritage;	A preliminary Archaeological assessment was undertaken for the site; the assessment included a search of the OEH Aboriginal Heritage Information Management System (AHIMS) database. The search was conducted over a 5x5 kilometre search area, centred around the site. There were no Aboriginal archaeological sites located within the study area. The site also does not contain any state or local heritage items.
To improve the visual amenity of the region, and provide an attractive landscape setting for future development;	The Planning Proposal is an opportunity to transform the site into an “Australian Resort”. A key component of this is the retention and integration of existing landscaping features, including significant vegetation. Landscaping is a defining element of the visual character of the site. The retained vegetation has been incorporated into the overall landscaping and open space design to create a green backdrop, provide shading and maintain the natural environment.
To provide opportunities for public and private conservation	The proposal will require ecosystem and species credits under the Biodiversity Offset Scheme to be retired prior to development. As

Objectives	Response
	such the establishment of Biodiversity Stewardship Sites (BSS) (or equivalent conservation outcomes) will be required. This will provide conservation opportunity for public and private landholders through establishment of BSS's on land.
To provide for a range of land uses, where appropriate that do not adversely affect the overall function of the corridor, including dwellings, passive recreation and infrastructure; and	The proposed development will retain the existing vegetation within the identified Biodiversity Corridor. Within the site, the masterplan proposes to revegetate areas that are currently cleared to create new local links to vegetation outside to the site. The condition of retained vegetation (currently unmanaged) within the site will be improved through management under a Vegetation Management Plan. Other land uses, including development have been cited predominately on cleared land.
To improve the health and well-being of the population	Landscaping is a defining element of the visual character of the site. The retained vegetation has been incorporated into the overall landscaping and open space design to create a green backdrop, provide shading for incoming residents and maintain the natural environment.

4. CENTRAL COAST REGIONAL PLAN

The Central Coast Regional Plan (CCRP) 2036 was prepared by DPIE and adopted in October 2016. The CCRP stablishes the strategic planning framework to deliver a prosperous and sustainable future for the Central Coast's current and future residents.

Similar to the NWSSP, a north eastly biodiversity corridor has been identified through the site (refer to

It should be noted that the corridor location in the North Wyong Shire Structure Plan and the 2036 Regional Plan is in consistent, and the proposed corridor (based on ground survey works) aims to practically resolve the inconsistency, optimise the retention of native vegetation onsite and reinstate the corridor with replanting.

Figure 3). This corridor aims to connect the coast to the foothills and providing an inter-regional landscape break.

The vision of the CCRP is to be delivered through four goals, and one of the goals relates to "*protection for the natural environment and careful, sustainable management of agricultural and resource lands"*.

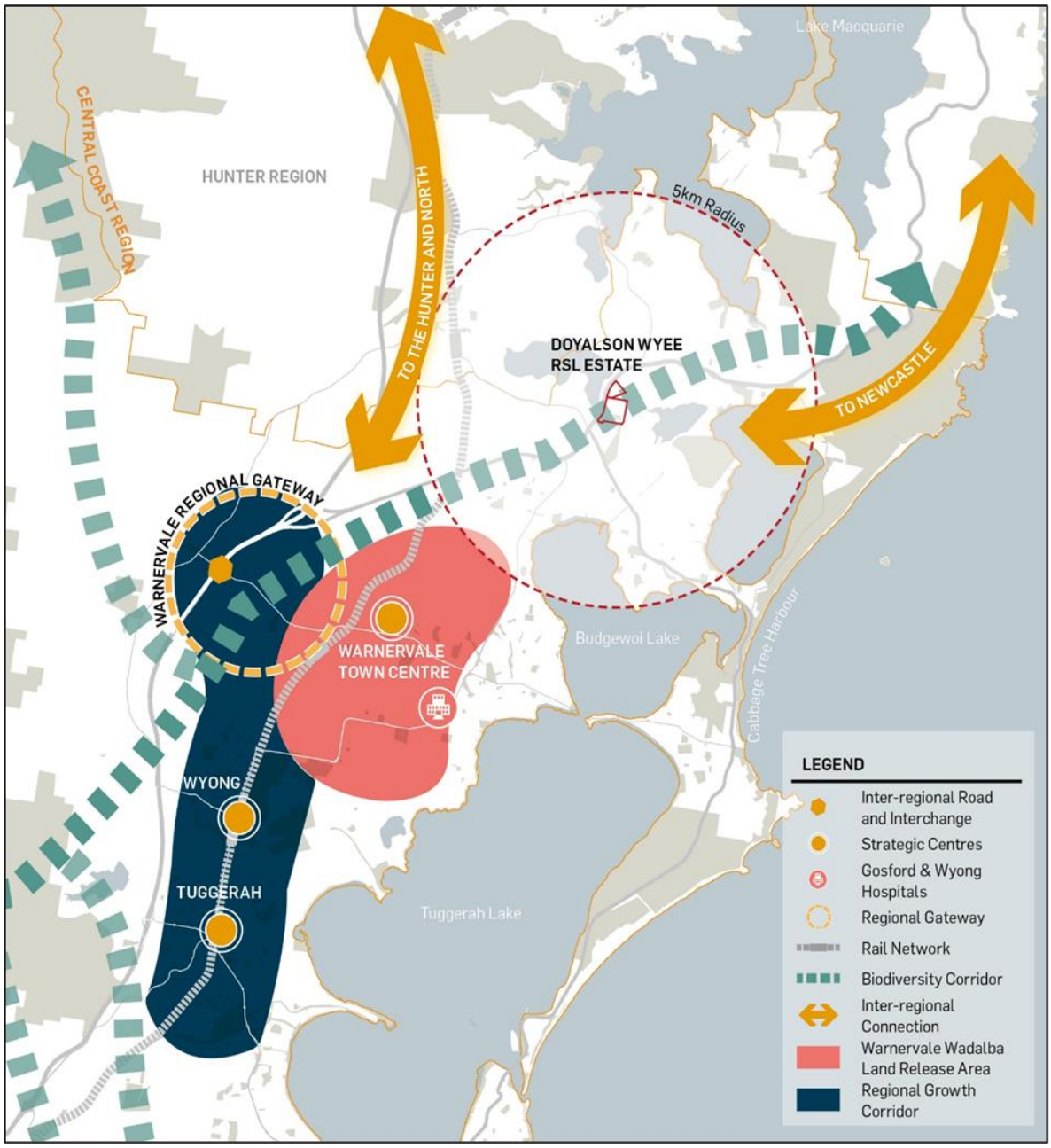
The proposed biodiversity corridor contributes to this goal in the following ways:

- Connectivity is currently limited within the site and to other adjacent areas of remnant vegetation. Large gaps and fenced areas are prevalent on all sides of the site. Some areas connected to adjacent vegetation will be retained along the eastern boundary of the proposed development.
- The proposed biodiversity corridor recognise the importance of retaining and protecting flora and fauna and is consistent with the corridor established under the CCRP.
- The proposed biodiversity corridor retains the existing riparian corridor and large areas of existing vegetation. New landscaping is also provided and managed to further enhance the landscape setting of the site.
- The proposal sensitively manages the natural landscape and incorporate the existing landscape setting into the master planning and landscaping design of the site, by creating an Australian Resort that celebrates a healthy natural environment and a recreational lifestyle.
- The proposed biodiversity corridor will result in improved biodiversity connectivity in the north of the site and has aimed to maintain and improve biodiversity connectivity in the southern portion where possible.
- Proposed secondary east-west green corridors is likely to provide steppingstones for locally known fauna species.
- A Vegetation Management Plan for retained areas of vegetation, which will include weed control, restoration, and habitat enhancement works will be incorporated at the DA stage. This proposal will improve biodiversity in the north of the site.

All residual impacts of the proposal will be offset in accordance with the Biodiversity Offset Scheme at the Development Application stage.

It should be noted that the corridor location in the North Wyong Shire Structure Plan and the 2036 Regional Plan is in consistent, and the proposed corridor (based on ground survey works) aims to practically resolve the inconsistency, optimise the retention of native vegetation onsite and reinstate the corridor with replanting.

Figure 3 Central Coast Regional Plan



Source: Urbis

5. DRAFT CENTRAL COAST BIODIVERSITY STRATEGY

The draft Central Coast Biodiversity Strategy (draft Strategy) has been developed by Central Coast Council and is the first strategy that combines the two former Councils in conservation planning and presents a scientifically-robust roadmap for the future of the biodiversity of the Central Coast.

The draft strategy was exhibited between September and November 2019 and is currently being finalised by Council.

The site has not been identified as a natural asset site or open space area proposed for acquisition.

The draft strategy identifies a framework for action with four themes:

1. Planning and Managing Biodiversity in Council's Natural Area
2. Ensuring adequate resourcing to enable Council to effectively manage its natural areas and expand the conservation estate
3. Promoting community appreciation and participation in biodiversity conservation
4. Protecting biodiversity through land use planning and information management
5. Demonstrating leadership in biodiversity conservation

Of these four themes, only theme 4 is applicable to local development, including this Planning Proposal.

Theme 4, *Protecting biodiversity through land use planning and information management* provides Council guidance for decision-making in order to achieve the objectives of the strategy.

The strategy uses three datasets to shape land-use policy and decision making including areas of high conservation value, connectivity between areas of high conservation value, and locally significant vegetation. The relationship of the proposed development to these datasets is described below.

Dataset	Response
Areas of high conservation value (i.e. high quality habitat, presence of iconic, rare and threatened features, and their contribution to the biodiversity of the region)	Whilst detailed priority mapping is not publicly available, the development site is likely to contain areas of high conservation value, including vegetation in 'moderate-good' condition, as well as Threatened Ecological Communities (TEC) listed under the BC Act. As assessed within the Biodiversity Assessment Report prepared by Eco Logical Australia, the development has been designed to retain, where possible, as much TEC vegetation as possible, and proposes to revegetate areas of highest conservation significance. The Concept Plan primarily locates development in areas of cleared land where there is no biodiversity value. The residual unavoidable impacts on species habitat and EEC vegetation were calculated in accordance with BAM, by utilising the Biodiversity

Dataset	Response
	Assessment Method Credit Calculator (BAMC). The BAMC is calculated based on a worst-case scenario, is precautionary in nature, and that a maximum of 189 ecosystem credits are required to offset the unavoidable impacts to native vegetation. The credits will be adjusted once the final footprint is determined and submitted formally with the first development application. The number of credits actually required is likely to be significantly less than 189.
The connectivity between areas of high conservation value (i.e. biodiversity corridors)	The priority corridors are mapped using the local network of protected public land, vegetation condition, polygon shape/configuration, and proximity to areas of identified core habitat. The spatial dataset supporting the connectivity of high conservation value is not available for review for this project.
Locally significant vegetation	No locally significant vegetation identified in Table 4 or Table 5 of the strategic plan would be impacted by the proposal.

6. CONCLUSION

The proposed biodiversity corridors will result in improved biodiversity connectivity to the north of the site and aims to maintain and improve biodiversity connectivity to the south where possible. The secondary east-west green corridor is likely to provide steppingstones for locally known fauna species.

The applicant will work with Council on the most appropriate planning mechanism to implement the biodiversity outcome of the site (location and width of biodiversity corridors).

The proposed south-north corridor retains and manages native vegetation (including EECs) and the planting of new vegetation to integrate with open space area, which will contribute and strengthen the green corridor envisioned in the North Wyong Shire Structure Plan.

The proposed corridors will also contribute to the regional northeast biodiversity corridor envisioned in the Central Coast Regional Plan 2036.

It should be noted that the corridor location in the North Wyong Shire Structure Plan and the 2036 Regional Plan is in consistent, and the proposed corridor (based on ground survey works) aims to practically resolve the inconsistency, optimise the retention of native vegetation onsite and reinstate the corridor with replanting.

The site has not been identified as a natural asset site or open space area proposed for acquisition in the draft Central Coast Biodiversity Strategy.

The Planning Proposal overall responds to Theme 4 of the draft Central Coast Biodiversity Strategy and primarily locates development in areas of cleared land where there is no biodiversity value. The residual unavoidable impacts on species habitat and EEC vegetation has been assessed in accordance with the Biodiversity Assessment Method and will be offset in accordance with BCAR.

Overall the Planning Proposal and the proposed biodiversity corridors respond to the regional biodiversity connectivity and the objectives outlined in the regional Plans and Strategy, therefore should be supported by the BCD.

If you have any questions or queries, please do not hesitate to contact Anna Wang on 0424 568 155 or the undersigned.

Yours sincerely,

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Level 7, Suites 28 & 29
19 Bolton Street
Newcastle NSW 2300
t: (02) 4910 3406

16 September 2019

Our ref: 18NEW10504

Doyalson Wyee RSL Ltd
c/o Urbis
Level 23, Darling Park Tower 2, 201 Sussex Street
Sydney, NSW 2000, Australia

Attention: Brett Elliss

Dear Brett,

Connectivity discussion for the Doyalson Wyee RSL Planning Proposal

Eco Logical Australia (ELA) were engaged by Doyalson Wyee RSL Ltd to undertake a biodiversity assessment to support the Planning proposal to undertake a rezoning of Lot 7340 DP1166918, Lots 1 – 9 DP215875, Lot 7 & 11 DP240685, Lot 1 DP503655, Lot 49 DP707586, and Lot 62 DP755266 (the site) to enable the future development of the site.

The biodiversity assessment was prepared and submitted to Central Coast Council (Council) on three occasions in the past 12 months. Recently, Council have requested:

> *"The southern portion of the proposal area contains known foraging habitat and potential breeding habitat for the vulnerable Glossy Black-Cockatoo. Incorporating an east-west green/wildlife corridor of a minimum width of 40 m that aims to retain breeding and foraging habitat for the species in the southern portion of the proposal area would demonstrate avoid and minimise principals and also reduce the species credit requirement for the proposal."*

The proponent has requested that ELA provide advice and an assessment of any biodiversity corridors established under the Concept plan as an alternative approach in lieu of establishing an east-west connecting corridor across the site for the purpose of fauna movement. This letter provides analysis of the possible benefits for birds and arboreal mammals in particular as these were raised by Council in a recent teleconference.

This assessment concluded that:

- Glossy Black Cockatoo was identified during field surveys, and as such all suitable vegetation has been mapped as requiring 'species credits' should it be impacted at the DA stage. This species is highly mobile and does not require canopy connectivity to facilitate movement throughout the landscape.
- The entire site is fenced, or separated from areas of adjacent native vegetation. In particular, the western boundary of the site is separated from other areas of native vegetation, by a dual carriage way (Pacific Highway), which is likely impassable for many fauna species.

- The study area was not identified as part of a wildlife corridor in the Wyong Flora and Fauna Survey Guidelines.
- The proposed concept plan will maintain (and likely improve) connectivity in the north of the study area, due to connection to the retained vegetation in the crown land parcel, as well as through retention of vegetation and planting in and around open space areas.
- All residual impacts of the proposal will be offset in accordance with the Biodiversity Offset Scheme at the DA stage.

Furthermore, this letter strongly advises against encouraging fauna crossing of the Pacific Highway, given the high risk of fatal animal strikes that are likely to result.

If you have any questions, please contact me directly on 02 4910 3413.

Yours sincerely,

Alex Pursche
Senior Ecologist

CURRENT CONNECTIVITY ASSESSMENT

Connectivity links

ELA have conducted fields surveys of the study area since 2017, resulting in a compliant survey in accordance with the Biodiversity Assessment Methodology (BAM; OEH, 2017), including all associated threatened species surveys. Despite the level of survey effort undertaken (in excess of the NSW guidelines), the only threatened species identified utilising the site was *Calyptorhynchus lathami* (Glossy Black-cockatoo), which was observed foraging in one of the *Allocasuarina littoralis* (Black She-oak) present onsite. This species of Cockatoo is locally recorded on the Central Coast and is highly mobile. As a result of the observation of this species, all vegetation onsite that includes potential breeding habitat (being vegetation containing hollow-bearing trees and *Allocasuarina* sp.) was mapped as requiring species credits.

Targeted surveys for other threatened species included camera trapping, Elliot trapping, and spotlighting for *Petaurus norfolcensis* (Squirrel Glider), which is also known to the Central Coast. Squirrel Glider was not identified during surveys, and this is likely due to the isolated, fragmented, and degraded vegetation within the site. Connectivity link assessment was undertaken for likely connection points between vegetation within and outside the study area (Figure 1), specifically for this species to understand whether or not the species may be using the study area. This included consideration of the glide distance from adjacent vegetation on the western side of the Pacific Highway. Glide distances based on metrics developed by Goldingay & Taylor (2009) whereby the traversable gap is calculated using the following Equation 1:

$$D = 1.8 \times (H - 2)$$

where D = distance of glide, and H = launch height.

A summary of the traversable potential for all identified gaps is discussed in Table 1. This connectivity assessment identified that:

- The entire site is fenced, largely preventing any macropod access, but also potentially a barrier to many other species. Fencing along the eastern boundary of the study area includes 2m chain link fencing.
- The southern boundary of the study area is adjacent to residential housing which is fenced and cleared of native vegetation.
- The western boundary of the study area is separated from any other areas of native vegetation by a 50 m gap comprising a 4 lane dual carriageway along the Pacific Highway. Both sides of the road easement are fenced. A maximum glide distance of 18 – 32 m for the Squirrel Glider has been calculated for these areas based on a canopy height of 12 – 20 m. The maximum glide distance is well below that required for Squirrel Gliders to clear the highway and also doesn't take into account the highest point of the tree canopy is likely to be even further back from the canopy edges where the distance between patches was measured from.
- The northern boundary of the study area is separated from native vegetation by approximately 77m of cleared farm land.
- The eastern boundary of the study area is fenced and separated from adjacent vegetation by a 30m wide managed powerline easement.

- The study area is connected to crown land in the north east. This area of vegetation is outside the planning proposal.

The study area is potentially connected to the east, whereby the gap between stands of native vegetation is slightly smaller, and is not subject to the intensity of traffic as is the western boundary. This boundary is still fenced using 2m chain link fence.

The study area was also not identified as part of a wildlife corridor in the Wyong Flora and Fauna Survey Guidelines (Figure 2). There are larger established potential corridors to the east and south, which are wider and more vegetated than any patches of vegetation within the study area.

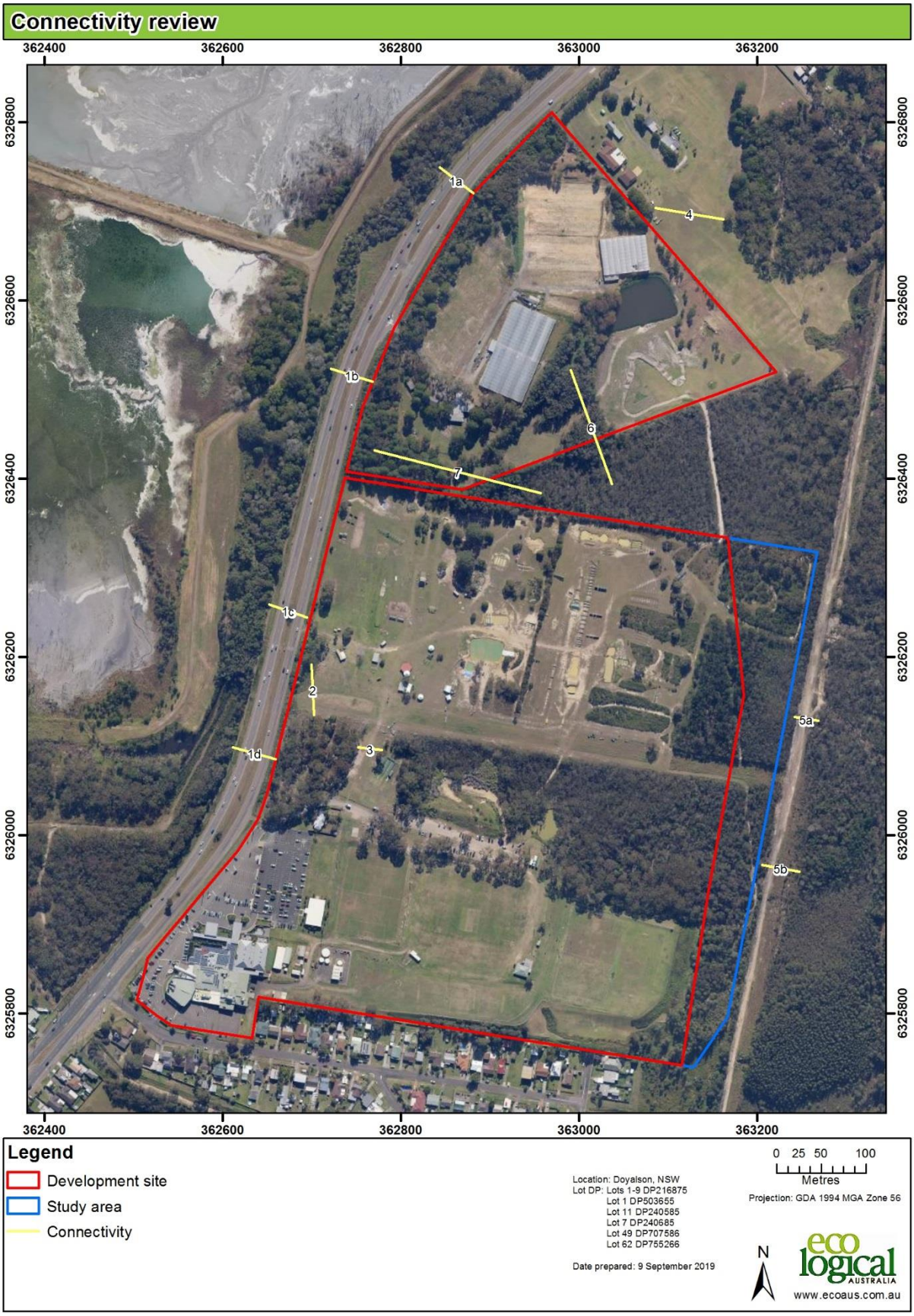

Figure 1 Connectivity links surrounding the study area

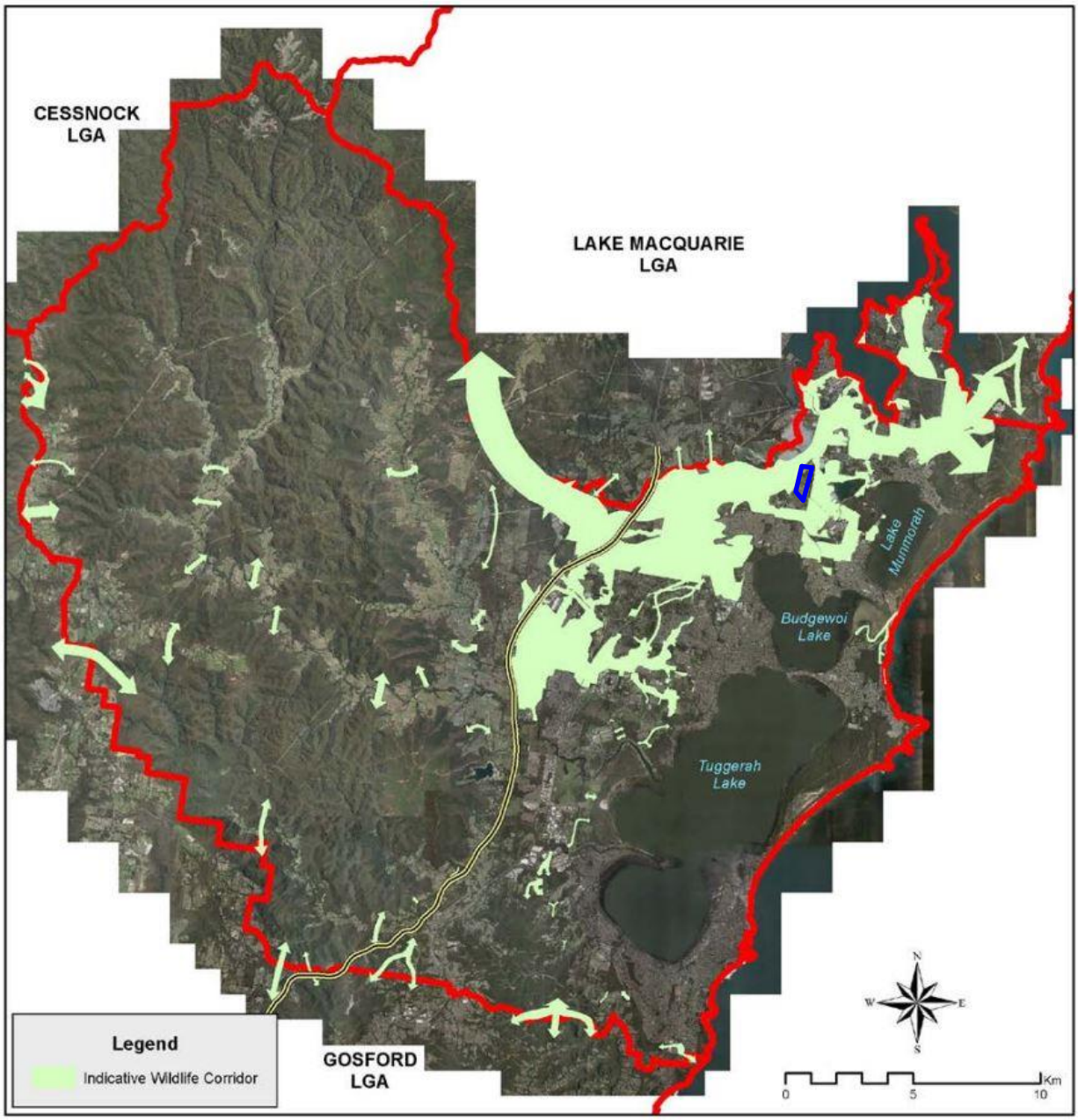

Figure 2 Wildlife corridor mapping (Wyong Council Flora and fauna Survey Guidelines; Study area marked in blue)

Table 1 Connectivity review.

Link	Link description	Species utilisation suitability
1a – 1d (external)	Gap width 45 – 50m. Pacific Highway, dual carriageway with two lanes in each direction, plus median strip, plus mown road verge. Fenced on both sides of the road easement. Western fence is 2m chain link with multiple rows of barbed wire above. Tree heights on western side vary from 8 – 12 m. Vegetation includes *Eucalyptus robusta* and *Melaleuca quinquenervia*, as well as priority weeds *Cinnamomum camphor* and *Ligustrum sp.*. Tree heights on eastern side vary from 12 – 20m. Vegetation includes *Eucalyptus haemastoma*, and *E. robusta*. Gap 1b is a stand of planted *Pinus radiata* with *C. camphora.* See Photograph 1 & 2.	Suitable for avifauna which can cross large gaps and avoid road strike. Unlikely to be traversed by gliding arboreal mammals (gap width in excess of glide distance). High risk of vehicle strike and human activity in the area may elicit avoidance behaviours further increasing the risk. Additionally, as each side of the road is fenced if an arboreal mammal did glide and initially avoid vehicular strike, the animal would remain exposed in the highway easement. Given this hazardous scenario it is unlikely to be a regular crossing for arboreal mammals. Maximum glide in westerly direction unlikely to be more than 32 m (using Equation 1 above). Gap width is in excess of glide distance by 13 – 18m. Maximum glide in easterly direction unlikely to be more than 18 m (using Equation 1 above). Gap width is in excess of glide distance by 27 – 32m. Impossible to be traversed by macropods as both sides are fenced. High risk of road strike for other arboreal mammals (such as possums etc.).
2 (internal)	Gap width 55 – 60 m. Tree heights vary from 12 – 20m. Gap between trees over managed grassland. No Mid-storey cover. Northern patch of vegetation is an isolated patch of *E. haemastoma*.	Suitable for avifauna which can cross large gaps. Unlikely to be traversed by arboreal mammals (gap width in excess of glide distance). Maximum glide distance from vegetation is no more than 32m which is 23 – 28 m less than gap width. Limited forage and no breeding refuge present at northern vegetation patch. Exposure to higher risk of predation by cats and foxes, due to limits in glide distance. Traversable by macropods (although none observed during site inspections.
3 (internal)	Gap width is 27m Tree heights vary from 12 – 20m. Both patches of vegetation contain *E. haemastoma*. Gap between trees over managed grassland. No Mid-storey cover.	Suitable for avifauna which can cross large gaps. Potential to be traversed by arboreal mammals due to being within glide distance, although none observed during field studies. Higher exposure to predation risk by cats and foxes, due to variations in maximum glide distance along edges. Traversable by macropods (although none observed during site inspections.
4 (external)	Gap width is 77m Tree heights vary from 10 – 15 m. Northern patch of vegetation contains *E. haemastoma*. Gap between trees over managed grassland. No Mid-storey cover.	Suitable for avifauna which can cross large gaps. Unlikely to be traversed by arboreal mammals (gap width in excess of glide distance). Maximum glide distance from vegetation us no more than 18 m which is 59 m less than gap width. Limited forage and no breeding refuge present at northern vegetation patch. Higher exposure to predation risk by cats and foxes, due to limits in glide distance. Traversable by macropods (although none observed during site inspections.

Link	Link description	Species utilisation suitability
5a -5b (external)	Gap width varies from 30 – 50. Maintained powerline easement. Fenced on western edge of easement. Mid-storey removed, and ground layer managed for vehicle access. Tree heights vary from 8 – 12 m. Vegetation on eastern side is *Allocasuarina littoralis* and *Glochidion ferdinandi*. Weed species such as *C. camphora* are also present.	Suitable for avifauna which can cross large gaps. Unlikely to be traversed by arboreal mammals (gap width in excess of glide distance). Maximum glide distance from vegetation is no more than 20 m which is 10 – 20 m less than gap width. Actual glide distance required is larger as most vegetation is regenerating *Casuarina glauca* and does not produce suitable launch and land sites. Limited forage and no breeding refuge present at eastern vegetation patch. Higher exposure to predation risk by cats and foxes, due to limits in glide distance.
6 & 7 (internal to external)	No gap to adjacent vegetation Planted exotic and native vegetation, as well as remnant *C. glauca* and *M. quinquenervia* in paddock. Mid-storey removed. Ground layer managed grassland.	Suitable for avifauna which can cross large gaps. Suitable for arboreal mammals. Low potential for fauna-vehicle interactions.

Photograph 1 Connectivity Link 1b across Pacific Highway – 49 m gap with fencing on both boundaries. Slashed median and power lines on either side of the road currently prevent any future connectivity being achieved

Photograph 2 Connectivity link 1d across Pacific Highway – 50m gap with fencing on both boundaries.

Photograph 3 Connectivity link 2 –57m gap with fencing on southern boundary. Northern vegetation patch isolated and degraded.

Photograph 4 Connectivity link 3 –27m unfenced gap

Photograph 5 Connectivity link 4 into neighbouring property – 77m gap

Photograph 6 Connectivity link 5 into neighbouring property –30m power line easement gap with fencing along eastern boundary

Photograph 7 Connectivity link 6 & 7 –No gaps, with large patch of Allocasuarina retained in crown land and connectivity retained under Open Space Plan.

FUTURE CONNECTIVITY ASSESSMENT

The proponent has developed a biodiversity and open space plan (Figure 3) which considers the known biodiversity values including threatened species from the study area, and proposes to distribute open and green space within the future development of the site. The biodiversity and open space plan includes:

- A riparian corridor around the 2nd order stream in the north
- Proposal to increase vegetation and connectivity along the northern boundary (which is currently unvegetated)
- Planting and vegetation management along the western boundary, which is currently unmanaged.
- Planting and vegetation management in and around proposed open space uses within the north and east of the development area
- Retention and management of native vegetation along the eastern boundary
- Planting along the periphery of the Jemena Gas Easement, where possible
- Retention of 17 hollow-bearing trees in a 0.76 ha central park open space, and retention of addtional hollow bearing trees along Pacific Highway frontage.
- Consideration of Glossy Black-cockatoo feed species for street tree planting (to be developed at DA Stage)

The biodiversity and open space plan will result in improved biodiversity connectivity along the eastern boundary and to the north of the study area, and has aimed to maintain and improve biodiversity connectivity in the southern portion where possible. Other green corridors within the study area are likely to provide stepping stones for locally known fauna species.

All impacts associated with any other loss of native vegetation or threatened species habitat will be fully offset as measured by the BAM and in accordance with the Biodiversity Offset Scheme under the NSW *Biodiversity Conservation Act 2016* (BC Act).

Limitations on east-west corridor enhancement

ELA notes that there is a considerable body of evidence to suggest the 50 m road gap along the Pacific Highway is potentially detrimental to local biodiversity, and any enhancement of vegetation around this roadway should be carefully considered. Any attempt to increase connectivity within the study area to areas on the adjacent side of the Pacific Highway is likely to lead to an increase in road strike, which would be detrimental to the local biodiversity and community. Any increased potential for animal/vehicle interaction may lead to injury of local residents.

Any enhancement of vegetation within the study area will always be limited by the lack of vegetation within the median strip of the Pacific Highway, the lack of any other crossing mechanism, and the ever-present risk of vehicle strike on such a busy road. The presence of powerlines along both eastern and western road-verges as well as fencing also prohibits any future enhancement within the roadway.

CONCLUSION

This letter provides additional information in relation fauna corridors at the Doyalson Wyee RSL Club lands. For consideration of the current Biodiversity and Open Space Plan, it is important to reiterate the following features of the study area and planning proposal:

- Connectivity is currently limited within the study area and to other adjacent areas of remnant vegetation. Large gaps and fenced areas are prevalent on all sides of the study area. Some areas connected to adjacent vegetation will be retained along the eastern boundary of the proposed development.
- Connectivity cannot be strengthened across the Pacific Highway.
- No Squirrel Gliders were identified within the study area, despite targeted surveys. The lack of connectivity may contribute to this result. Foraging and breeding habitat has been identified within the study area for Glossy Black-cockatoo. Suitable habitat for this species occurs extensively throughout the local area. Habitat for this species will remain locally under the current Planning Proposal, including large areas adjacent to the study area.
- A Vegetation Management Plan for retained areas of vegetation, which will include weed control, restoration, and habitat enhancement works will be incorporated at the DA stage. This proposal will improve biodiversity in the north of the study area.
- All residual impacts of the proposal will be offset in accordance with the Biodiversity Offset Scheme at the Development Application stage.

Figure 3 Biodiversity and open space plan