

Ecology

The BDAR has been reviewed and the following comments require further clarification before any determination can be made:

Outstanding Issues

1. **Landscape Features (Section 3.3)**

The percent native vegetation cover has been calculated using the extent of native vegetation within the site as opposed to the extent of native vegetation occurring within the 1500m buffer assessment area (shown in Figure 6). The percent native vegetation cover is used as a filter by the BAM-C to predict threatened species likely to occur or use habitat on the subject land. The BAM-C case and BDAR will need to be updated to reflect the percent native vegetation cover within the 1500m assessment area.

The native vegetation cover within the 1500 m buffer has been calculated and the BDAR has been amended to reflect this (see Section 3.3 Native vegetation cover within the assessment area). The BAM-C has also been amended.

2. **Plant Community Types (PCTs) (Sections 2.2, 4.2)**

The justification for the selected PCTs appear to be based on the presence of a small number of recorded species and no additional justification is provided. The BDAR must provide an evidence-based justification of the decision pathway used in identification of each PCT (e.g. vegetation composition and structure, landscape position/geomorphology etc.).

It is noted that PCT 3445 is not listed as occurring within the Upper Hunter sub-bioregion or Dungog LGA. Additionally, this PCT is described as occurring “near-coastal hills in habitats exposed to maritime breezes in the Wallis and Myall Lakes area on the Lower North Coast with an outlying occurrence on the Hunter Coast” and apart from *E. tereticornis*, the canopy species associated with this PCT do not appear to be consistent with the vegetation recorded on site.

A review of the PCTs has been undertaken. The BDAR and BAM-C have been amended as required. This review has determined that neither PCT 3445 and PCT 3444 would be the best fit for the site’s vegetation due to the site’s location and landscape features. A range of locally mapped PCTs were considered and it was concluded that PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest would be the best fit for the entire area of the site’s native vegetation. PCT 3446 is a variable community with a mix of canopy species. It contains all of the site’s canopy species and matches well with the floristics, topography, soil characteristics and location of the community. Note that there are localised occurrences of *Eucalyptus canaliculata* and *E. tereticornis* on the site. It was not deemed necessary to separate these areas into a different PCT as this kind of variability is typical of PCT 3446. Detailed justification for the selection of PCT 3446 has been provided in the BDAR.

3. **Non-native vegetation (Section 4.2.4)**

All parts of the subject land that do not contain native vegetation must be clearly shown on the Site Map. Justification as to why these areas do not support any native vegetation must be provided in the BDAR. No plots or other repeatable quantitative method was undertaken within this vegetation zone to confirm the absence of native vegetation. If groundcover within the identified areas of “exotic grassland” is determined to be native (i.e., >15% cover), vegetation plots in accordance with BAM should be undertaken to determine the condition (vegetation integrity score) of the zone. Given the size of the site and variation of groundcover throughout the site, this may require additional vegetation zones to differentiate between “low condition vegetation” and vegetation in “moderate to good condition” (i.e., a VIS >15 for EEC derived vegetation).

Grassland plots were undertaken in the derived grassland areas of the site. These indicate a predominance of exotic species (>85%) and thus the vegetation has been mapped as non-native. See Figure of the BDAR for the locations of the grassland plots. The grassland plot data has been inserted in Appendix of the BDAR. Figure 6 of the BDAR has been amended to include non-native vegetation.

4. Vegetation Zones and Vegetation Integrity Scores (Sections 4.4, 4.5)

It is not clear what plot data has been used to calculate the VIS for each vegetation zone. The specific plot data used for each vegetation zone should be clearly identified within the BDAR. There also appears to be errors in the reported VIS scores when the provided plot data is entered into BAM-C.

From Figures 2-4 and 5, it appears that Plots 3 and 5 are the only plots undertaken within the areas identified as PCT 3445. An overall impact area of 3.35 hectares was identified for this zone and a minimum of two plots is required for entry into the BAM-C. When entered into the BAM-C, the plot data provided for Plots 3 and 5 (Appendix D) results in a significantly higher VIS than the 56.1 reported in the BDAR (see below). This difference in reported VIS would incorrectly result in a significantly lower credit obligation and must be reviewed. Additionally, a summary of plot data values entered into BAM-C and copies of original datasheets should also be provided in the BDAR.

Plot data has been re-entered into the BAM-C with the new PCT and VZs.

5. Staged Development and Vegetation Zones

It is noted that the vegetation zones have been classified based on the staged development of the site, and the vegetation condition for each PCT is the same. I assume this has been done to calculate the credits required for each stage of the development.

If the proponent wishes to stage the development and the associated retirement of credits, the BDAR should be amended to reflect each proposed stage and the credits (both species credit species and ecosystem) associated with the impacts of each stage. They will also need to update site maps to clearly show the proposed staged areas.

The credits generated for staged developments would be embedded in the project consent (if approved) and the proponent must retire the credits associated with each stage prior to impacting that associated staged area.

To facilitate this, a separate BAM-C case and credit report should be produced for each stage.

The associated retirement of credits, the BDAR has been amended to reflect each proposed stage and the credits (both species credit species and ecosystem) associated with the impacts of each stage. The maps has also been updated in the BDAR to clearly show the proposed staged areas.

6. Targeted Threatened Flora Surveys

The following issues regarding the adequacy of threatened flora surveys within the site require additional input or clarification:

- The targeted threatened flora surveys do not cover the extent of the proposal area (see Figure 10). It is noted that Table 16 states that "Parallel field transverse method in accordance with NSW Guide to Surveying Threatened Plants (DPIE, 2020)" was undertaken for the species considered. This guide should be reviewed and survey effort should be consistent with the intended target species. At a minimum the surveys must cover the proposed impact area.*
- The date of surveys and survey effort is also not consistent with the timing and effort listed in Table 18.*
- Table 18 states that surveys were completed for Pterostylis chaetophora on 22 November 2021. No map showing the survey coverage is provided. Bionet also states that this species flowers from September to early November which is outside the stated survey period. Species*

surveys should only occur during the time specified for that species, unless there is justification to vary this timing and this is provided in the BDAR.

- The BDAR has not considered the potential presence of threatened flora species recorded in the local area including *Eucalyptus glaucina* (Slaty Red Gum) and *Cynanchum elegans* (White-flowered Wax Plant). Both these species have been recorded nearby in similar habitat to that available on site and both of these species should be considered in the BDAR. *E. glaucina* in particular can be locally common and surveys should consider the potential presence of this species.

It is noted that *Eucalyptus globulus* (Tasmanian Blue Gum) was recorded in Plot 3. The site lies outside the natural distribution of this species and the presence of this species is questionable. Young growth of *Eucalyptus glaucina* and *E. globulus* are notably glaucous and there may be potential to misidentify these species

- There may be additional threatened species that require consideration following revision of the PCTs present within the site.

The GPS tracking is not available for November 2021 and is incomplete for the May 2023 and July 2023 periods, due to technical issues. The targeted threatened flora survey was repeated in September and October 2024. During this survey, the entire proposed impact area was traversed at a minimum of 10 m wide transects. The BDAR has been amended accordingly and Figure has been amended to include the most recent September 2024 survey tracking.

The *Eucalyptus globulus* entered into Plot 3 was a typo. The species recorded in Plot was in fact, *E. globoidea*. The Plot 3 data has been amended accordingly.

7. Targeted Threatened Fauna Surveys

The following issues regarding the adequacy of targeted fauna surveys within the site require additional input or clarification:

- Surveys for Southern Myotis should be consistent with the threatened bat survey guideline (DPIE, 2021). Bat detectors should be placed over suitable waterbodies to detect feeding Southern Myotis. The location of ANABAT surveys is not provided however the photos provided in Appendix E do not appear to be targeting suitable habitat. The BDAR should provide justification as to the adequacy of the targeted survey. Otherwise, an expert report is required to exclude presence or assume presence and account for the Southern Myotis species credits in accordance with BAM.

Bat call detectors were indeed placed near aquatic habitat in the site, specifically to target southern myotis. Figure 18 in the updated BDAR has been amended to include these locations.

- Surveys for Threatened Owls and other hollow-dependent fauna. It is noted within the BDAR that there are numerous hollow-bearing trees and no further information is provided. The location and class of hollows should be detailed within the BDAR. For threatened Owls, surveys should be conducted in accordance with the requirements listed on BioNet. Otherwise, an expert report is required to exclude presence or assume presence and account for the species credits in accordance with BAM.

Nocturnal spotlighting call playback surveys were repeated in September 2024. Call playback involved the following methodology (in line with BioNet): A 10-minute listening and observation time prior to broadcasting was undertaken. Calls were then broadcast for no more than 15 seconds followed by at least 30 seconds of listening and watching time. The broadcasting and listening/watching process was repeated at each location for 15 minutes for each target owl. Following this, owls were searched for within a 1 ha area

around the broadcast location. The BDAR and Figure 17 have been amended accordingly with this information.

A hollow-bearing tree survey was also undertaken in September 2024. The BDAR and Figure 16 have been amended accordingly.

- Surveys for Brush-tailed Phascogale should be consistent with the requirements listed on BioNet which state:

“Survey must be undertaken using baited cameras. The bait type used must remain as an effective attractant until replaced. Honeyed oat balls will need to be replaced daily. Other effective baiting methods include using a baited canister with small holes and capped at either end, to limit bait theft by other species, or honey-water, sprayed very liberally in front of each camera. The baited canister and honey-water will require less frequent replenishment of the bait compared to a bait ball. Cameras should be set at head height, or above, facing the branch or tree trunk where a honey-based bait has been placed. Cameras must remain in place for a minimum of 4 weeks with cameras checked and baits replaced after 2 weeks. A minimum of 4 cameras, independent of the size of the subject land, must be used for sites up to 1 ha, then an additional 2 cameras for every ha of suitable habitat thereafter. Cameras must be evenly spaced across the site. Where potential habitat is disconnected by gaps of 50 m or more, each habitat patch should have a minimum of 4 cameras for the first ha, and 2 cameras for every ha thereafter. Malfunctioning cameras must be replaced and additional cameras and time must be invested to address the lost survey effort. That is, at least 22 working, baited, evenly spaced camera traps are required for the first 10 ha of suitable habitat.”

The camera trap locations, shown in Figure 9, do not appear to meet the Brush-tailed Phascogale survey requirements. Additionally, the camera trap photos suggest the camera traps were targeting a range of species (ground, baited, unbaited) and it is not clear which cameras were targeting what species. Additional information or justification is required. Otherwise, an expert report is required to exclude presence or assume presence and account for the species credits in accordance with BAM

Camera trapping surveys involved the deployment of 14 camera traps for a period of 4 weeks, within either the impact area or just on the border of the impact area and the conservation area. Baits included honeyed oat balls placed in bait canisters, and these were checked at the 2-week interval. Cameras were set in trees, at head height. It is noted that the BioNet requirements for brush-tailed phascogale surveys require a minimum of 4 cameras for the first ha and then 2 cameras for every ha after that. The impact area is 4.61 ha of native vegetation, which requires 11-12 cameras. Therefore, the 14 cameras deployed would meet the minimum survey requirements. Camera spacing was designed to reflect the areas of ‘directly impacted vegetation’ within the residential lots (i.e., the areas impacted by the building envelopes and APZs shown in Figure 12 of the BDAR). It is considered that this combined with the hair trap and spotlighting survey effort would satisfy the survey requirements for the target arboreal mammals. The BDAR has been amended to provide a more detailed description and justification of the camera trapping survey effort.

- Surveys for Koala should be consistent with the Koala BAM Survey Guide (DPE, 2022). The survey undertaken for the BDAR does not appear to meet the requirements and additional information or justification is required. Otherwise, an expert report is required to exclude presence or assume presence and account for the species credits in accordance with BAM.

Additional comment regarding the adequacy of the Koala Assessment report is provided below.

Targeted surveys for koala were repeated in September and October 2024, using the Spot Assessment Technique (SAT), in accordance with DPE (2022) *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*, as follows:

- A central tree was located and marked. Moving outwards from the centre tree, 29 of the nearest trees (in suitable habitat) were identified.
- A radial search for koala scats was undertaken beneath each of the 30 trees, within a prescribed search area extending 1 m from the base of each tree. Scat search effort was a minimum of two person-minutes for each tree.
- A total of 3 SAT surveys were undertaken. Considering that the impact area is 4.61 ha, this would satisfy the minimum effort when dividing the approx. number of ha by 2.25 as stated in DPE (2022). SAT locations were also spaced out in accordance with the 150 m grid spacing requirement in DPE (2022).

It is considered that with this recent survey effort combined with additional spotlighting in September and October 2024, the survey effort now meets the minimum requirements for koala. The BDAR and Figure 14 has been amended accordingly.

8. Koala Assessment Report

As above, the inadequacy of surveys undertaken for Koalas appears to be reflected in the findings of the Koala Assessment Report (KAR). The KAR does not identify the presence of Eucalyptus tereticornis (Forest Red Gum), a preferred local food tree, which is reported as a major component of the vegetation on site in the BDAR.

It is noted that historical Koala records occur around the site and are much more common around the Dungog township where surveys and public observations occur more regularly. The vegetation within the site has connectivity to large tracts of habitat extending to the south and west of the site and further consideration should be given to the potential availability and importance of preferred habitat occurring within the site.

As per above, koala SAT surveys and additional spotlighting was undertaken in September and October 2024, in accordance with DPE (2022) *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*. The KAR has been amended to reflect this and also to acknowledge the presence of *Eucalyptus tereticornis* in the site. Refer to Appendix I of the updated BDAR.

9. Avoid and Minimise Impacts and Assessment of Impacts

The Biodiversity Conservation Act requires applicants to demonstrate they have applied the avoid-minimise-offset hierarchy during the impact assessment process.

The impact assessment notes the proposed development of the site would result in the removal / selective clearing of 4.5 hectares. The applicant is requested to provide additional information on the following:

- *The assessment does not consider any potential impacts associated with the change of land use to residential. What measures will be imposed to ensure habitat retained within each lot is protected in the long-term.*
- *Assessed impacts from the proposed development appear to be limited to the road reserve and building envelopes and APZs. No consideration has been given to impacts associated with lot boundaries and fencing, lot access, service easements, stormwater treatment areas, and OSSM.*

As per the BAM Stage 2 guideline (DPE, 2023), other infrastructure and residential uses, e.g. fences, effluent disposal, sheds, gazebos, stock, etc., would result in further unregulated clearing and degradation of the vegetation, so it should be treated as 100% loss on such small lots unless a mechanism could be established by conditions of consent to protect that vegetation from such uses (BAM 2020 Subsection 7.1.2(1.e.)).

For this proposal, on lots where significant areas of adjoining vegetation can be retained (e.g., Lots 231, 325, 326, 327, 328, 329, 333, and possibly 337, 336, and 334) a Section 88B instrument and VMP may be a suitable mechanism to protect retained areas.

For Lots where the proposed impacts would result in the removal of most vegetation within the Lot (eg., Lots 305, 306, 310, 382) it should be assumed that the changing land use and increased edge effects would result in a 100% loss unless a suitable mechanism to protect retained habitat can be provided.

- *The BDAR does not provide any information on the location of important habitat attributes including hollow-bearing trees or preferred Koala food trees. This information should be provided and used to inform the location of impact areas.*
- *The proposal will effectively reduce connectivity or isolate habitat to be retained within the central part of the site from large tracts of habitat to the south of the proposal area. What measures are proposed to retain connectivity and / or provide justification for isolation of habitat within the site.*

The BDAR has been amended with the following avoidance and minimisation proposals:

- A total of 21 ha of land around the site's western boundaries will be retained within a conservation area (Lot 338). Within this area, a total of 6.5 ha of existing PCT 3446 occurs. The remaining area of land will be allowed to naturally restore back to native vegetation, resulting in an increase of approximately 21 ha of native vegetation. A proposed Vegetation Management Plan will prescribe the management measures to protect and restore native vegetation in the conservation area.
- Additionally, 14.7 ha of PCT 3446 is to be retained within the residential lots. This includes the majority of the site's central bushland area along a tributary of Cangon Creek. It is proposed that these areas of vegetation are protected in perpetuity by a s.88B covenant under the *Conveyancing Act 1919*.

These are significant measures that would have a net benefit in terms of native vegetation and threatened species habitat coverage across the site. They would also ameliorate any indirect impacts from edge effects etc. and would ensure that habitat connectivity is maintained (and improved). The BDAR has been amended to include these measures.

Note also, a hollow-bearing tree survey was undertaken in September 2024. The BDAR and Figure 16 have been amended accordingly.

10. Matters of National Environmental Significance (MNES)

An assessment addressing the requirements of the EPBC Act has not been provided.

A MNES assessment has been undertaken and is provided in Appendix J of the BDAR.