Department of Planning and Environment

Our ref: DOC22/324389
Your ref: SSD-10807896

Mr Dominic Crinnion
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Dear Mr Crinnion

Thunderbolt Wind Farm (SSD-10807896) – environmental impact statement

Thank you for your request dated 26 April 2022 to the Biodiversity, Conservation and Science Directorate (BCS) of the Department of Planning and Environment (DPE) inviting comments on the Environmental Impact Statement (EIS) for the Thunderbolt wind farm.

BCS has reviewed the biodiversity development assessment report accompanying the EIS.

BCS's biodiversity recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**. Guidelines for mapping the extent of woodland critically endangered and endangered ecological communities are provided in **Attachment C**.

If you require any further information regarding this matter, please contact Liz Mazzer, Senior Conservation Planning Officer, via liz.mazzer@environment.nsw.gov.au or (02) 6883 5325.

Yours sincerely

Samantha Wynn

Samantha Wynn
Senior Team Leader Planning North West
Biodiversity, Conservation and Science Directorate

24 May 2022

Attachment A – BCS's Recommendations

Attachment B – BCS's Detailed Comments

Attachment C – BCD North East Branch – Principles for mapping the extent of woodland critically endangered and endangered ecological communities

BCS's recommendations

Thunderbolt Wind Farm – Biodiversity Development Assessment Report

BAM	Biodiversity Assessment Method
BBAMP	Bird and bat adaptive management plan
BDAR	Biodiversity Development Assessment Report
PCT	Plant Community Type
SAII	Serious and Irreversible Impacts
TBDC	Threatened Biodiversity Data Collection

Recommendations

1.1 The prescribed impact assessment must directly address all of section 6.1.5 of the BAM.

1.2 The source of the criterion presented be provided.

2.1 A draft bird and bat adaptive management plan be prepared in consultation with BCS and included in the prescribed impact assessment.

2.2 At a minimum, the draft bird and bat adaptive management plan should include monitoring methodology, offset quanta for bird and bat collision, fatality or injury and a trigger, action, response plan.

2.3 Proposed mitigation measures for prescribed impacts such as blade strike and barotrauma should be presented in the BDAR.

2.4 Options to compensate for unavoidable prescribed impacts, and the decision pathway and justification for suggested credit numbers or other compensatory actions, should be clearly documented in the BDAR.

3.1 Ecosystem credits be calculated for the indirect impacts of turbine operation on native vegetation.

4.1 Further assessment of turbine barrier effects on fauna is required.

5.1 The full methodology used for bird and bat utilisation surveys be included in the prescribed impact assessment.

5.2 All results be presented and analysed in the prescribed impact assessment, including analysis of the relative likely impacts of individual turbines.

6.1 BCS be consulted about the bird utilisation survey methodology.

6.2 Further bird utilisation surveys are conducted.

7.1 BCS be consulted again about bat survey methodology.

7.2 Consultation with bat experts be documented and incorporated into the bat impact assessment and used to review SAII.

7.3 Further bat utilisation surveys be conducted.

8.1 PCT mapping of DNG be reviewed following the *BCD North East Branch – Principles for mapping the extent of woodland critically endangered and endangered ecological communities.*

8.2 Areas assessed as woodland should be allocated to woodland zones and biodiversity credits recalculated.

9.1 Data in the BAM calculator be checked to ensure accuracy with plot data and spatial data.

9.2 Allocation of vegetation zones for PCT 559 be reviewed.

9.3 All BAM plots used for credit calculations be included in the spatial file.

9.4 The BDAR and BAM calculator be updated to incorporate changes.

10.1 The updated BDAR must include the finalised biodiversity credit reports dated within 14 days of certification of the BDAR.

Attachment B

BCS's detailed comments

Thunderbolt Wind Farm – Biodiversity Development Assessment Report

1. The draft turbine strike prescribed impact assessment does not meet BAM requirements

The draft prescribed impact assessment (sections 4 to 10 of Appendix F of the BDAR) addresses a number of criterion. The document does not state where these criterions are from. The criterion provided do not address all of the requirements of section 6.1.5 of the BAM, in particular:

- predict and map the habitual flight paths for nomadic and migratory species likely to fly over the proposed development site.
- map the likely habitat for resident threatened aerial and raptor species.
- The technique, effort and timing of targeted surveys for each species must be documented and justified in the BDAR.

Recommendations

1.1 The prescribed impact assessment must directly address all of section 6.1.5 of the BAM.

1.2 The source of the criterion presented be provided.

2 Offsets should be calculated for prescribed impacts

Whilst the assessment of prescribed impacts does not result in the generation of biodiversity credits, the consent authority has the discretion to increase the number of biodiversity credits to be retired due to environmental, social and economic impacts of the proposed development, including for prescribed impacts. If mitigation measures or adaptive management do not adequately address the potential impacts, the retirement of additional relevant biodiversity credits or implementing conservation actions may be an acceptable approach.

A bird and bat adaptive management plan (BBAMP) is to be prepared to help mitigate prescribed impacts. Section 4.4 of the BDAR states that the plan will develop trigger levels and mitigation measures and will be prepared in consultation with BCS.

BCS considers that the BBAMP should include:

- A proposed monitoring methodology
- Offset quanta for each bird and bat collision, fatality or injury. The proposed credit quantum should be reviewed and fully justified by the accredited assessor. Credit quanta should be calculated according to the conservation status of individual species that may be struck, for example:
    - For a vulnerable species - a one-off retirement of ten credits for each individual struck.
    - For an endangered species – a one-off retirement 15 credits for each individual struck.
    - For a critically endangered species – a one-off retirement of 20 credits for each individual struck.
- For protected (non-threatened) species, the impact to the protected species should be offset where:

- There are no effective and scientifically validated mitigation measures available to reduce the likelihood of future strikes of a protected (non-threatened) species; and
- Continued turbine strike impacts are likely to have consequences for the persistence of populations.

- A trigger, action, response plan (TARP) with specific and measurable triggers. Triggers for corrective actions should be based on strike rate extrapolations when assessed annually.
- Mitigation implementation protocols (eg shutting down turbines during migration events)
- Trials of alternative technologies (eg painting rotor blades to make them more visible to birds)

The BBAMP is an important tool for monitoring and mitigating prescribed impacts. As such, a draft BBAMP should be included with the prescribed impact assessment. The draft BBAMP should be prepared in consultation with BCS.

Recommendations

2.1 A draft bird and bat adaptive management plan be prepared in consultation with BCS and included in the prescribed impact assessment.

2.2 At a minimum, the draft bird and bat adaptive management plan should include monitoring methodology, offset quanta for bird and bat collision, fatality or injury and a trigger, action, response plan.

2.3 Proposed mitigation measures for prescribed impacts such as blade strike and barotrauma should be presented in the BDAR.

2.4 Options to compensate for unavoidable prescribed impacts, and the decision pathway and justification for suggested credit numbers or other compensatory actions, should be clearly documented in the BDAR.

3 Indirect biodiversity impacts should be offset

Section 1.1 of the draft prescribed impact assessment states that the rotor swept area will cover 2.56 hectares per turbine, or approximately 82 hectares of total aerial space for the 32 proposed turbines. Figure 11.1 of the draft prescribed impact assessment provides a map of the potential aerial impact zone. This zone has been mapped by putting a 100-meter buffer on each turbine. While there is no rationale provided for the size of this buffer, it indicates an aerial impact area of approximately three hectares per turbine, or 96 hectares in total.

Indirect impacts are addressed in section 5.1.2 of the BDAR. The assessment of indirect impacts concludes that there will be little substantial change to water, noise, weed species, pest animal, lighting or air quality related impacts on land adjacent to the subject land. The indirect impact of the turbines on adjacent native vegetation and its fauna has not been addressed.

Retained vegetation adjacent to the blade swept areas and surrounding buffer may be subject to indirect impacts, for example discouraging birds from nesting or roosting near turbines. Where indirect impacts cannot be appropriately mitigated through the implementation of onsite measures, BCS recommends that a credit requirement is calculated to offset these indirect impacts to biodiversity.

It will be necessary for the accredited assessor to determine the type and extent of indirect impacts, as well as the area of native vegetation affected by those impacts.

Spinning turbine blades are likely to have an indirect impact on birds and bats by removing the availability of some habitat components, such as air space above areas of native vegetation used for foraging and movement, including for migration.

To enable the development of an appropriate offset for the rotor swept area, a circle should be drawn around each turbine pedestal (as has been done in figure 11.1 of the draft prescribed impact assessment). The radius of this circle should be no smaller than the length of one turbine blade in addition to a buffer from the rotor swept area subject to indirect impacts. The selected radius is to be described and justified in the BDAR.

The area of native vegetation that lies within this *'indirect impact'* area will need to be calculated. Given that indirect impacts will result in only a partial loss of biodiversity from these areas, the credit requirement generated should reflect this.

This can be achieved in two ways.

a) A partial loss percentage should be applied to the area of vegetation present in the '*indirect impact area'*. For example, the partial loss could be between 5% and 20%, or it may be less or more, but usually not more than 50%. This percentage would again depend on the nature of the indirect impacts identified, the impact mitigation proposed, the intensity of the development and the proximity and susceptibility of the retained vegetation.

   The partial loss percentage will need to be fully justified in the BDAR.

   Once the partial loss percentage has been determined and appropriately justified it can then be prorated, for the purposes of the credit calculation, across the total indirect impact area by splitting the area up into separate management zones. If this option is taken an assessor should split the indirect impact area into a total-loss zone (defined by the indirect impact percentage) and a zero loss zone. For instance, if a wind turbine buffer is 5ha and the associated indirect impacts is determined to be 50% partial loss, the management zones would include a 2.5ha zone of total-loss and a 2.5ha zone of zero loss. Each management zone should be appropriately labelled in the calculator i.e. *'indirect impact management zone'*, or similar, with the future site values for each zone adjusted accordingly.

b) The total area of vegetation affected by indirect impacts within the '*indirect impact area*' can be included as the '*indirect impact management zone'* in the calculator, with the *'future site value scores'* adjusted to reflect a partial loss resulting from the indirect impacts anticipated.

This suggested calculation method should only be applied in this context, given the inherent difficulty in associating the indirect impacts associated with wind turbines to specific compositional, functional or structural attributes of vegetation zones. This method should not be considered an endorsed method for partial loss calculations associated with other development types.

The use of either approach will generate an ecosystem credit requirement for the indirect impacts of the construction and operation of the wind farm on biodiversity. The retirement of these credits at an offset site will ensure that similar vegetation communities are protected and managed for conservation purposes in perpetuity.

All steps undertaken to determine the offset requirement for indirect impacts in accordance with the above must be documented within the BDAR and reflected where necessary in the credit calculator.

Recommendation

3.1 Ecosystem credits be calculated for the indirect impacts of turbine operation on native vegetation.

4 Information is required on potential barrier impacts

The BDAR does not consider that groups / rows of turbines are likely to cause barrier effects to aerial species. An assessment of the potential barrier effects of the turbines to species moving across the landscape should be added to the BDAR. This information should feed into calculations of individual turbine risk ratings and predicted strike rates.

Recommendation

4.1 Further assessment of turbine barrier effects on fauna is required.

5 More information is required about the bird and bat utilisation surveys

Section 2.0 of the draft prescribed impact assessment provides a brief outline of the methods used for the bird and bat utilisation surveys. However, there is not enough detail about survey effort or techniques. This information should be provided to further inform prescribed impacts and support any conclusion made regarding the project.

There is also inadequate information provided relating to results. The only results provided are some species lists. There is no analysis of likely flight paths or identification of turbines that are likely to have higher impacts.

There is conflicting information regarding when the bird utilisation surveys were conducted. Table B 1.2 indicates that bird utilisation surveys were conducted in August 2020, June 2021, August 2021, and October 2021. Section 2.1 of the prescribed impact assessment states that bird and bat utilisation surveys were conducted in May 2020 and February 2021. Clear information about survey timing is needed to ensure that surveys are conducted at times when species are most likely to be detected.

Recommendations

5.1 The full methodology used for bird and bat utilisation surveys be included in the prescribed impact assessment.

5.2 All results be presented and analysed in the prescribed impact assessment, including analysis of the relative likely impacts of individual turbines.

6 The bird utilisation assessment does not adequately cover the project site

Only three bird survey sites were monitored across the project area. One of these was located 2.7 kilometres from the nearest turbine, in the far east of the project area. No bird survey sites were monitored in the most densely vegetated areas to the north and west of the project area. Ideally, Bird Utilisation Study sites should be placed approximately every two kilometres along turbine arrays to ensure that a composite map of flight paths of at-risk birds can be complied for the entire wind farm.

Owl call playback was only conducted at one site within the project area. One ‘owl site’ was located in the north-east of the project area, but no explanation is provided as to what an ‘owl site’ is.

No survey or analysis of likely habitat (such as tree hollows or raptor nests) is provided.

Recommendations

6.1 BCS be consulted about the bird utilisation survey methodology.

6.2 Further bird utilisation surveys are conducted.

7 The bat utilisation survey is not adequate

BCS provided advice to the accredited assessor on 21 August 2020. Advice in this email included:

- Three acoustic detectors be put on each met mast at ground level, canopy height (20 to 30 metres) and above the canopy (70 to 80 meters)
- The bat survey should ensure all woody vegetation zones with native canopy over the subject land are covered. The spatial intensity of survey should be based on the number of turbines that are proposed in vegetation zones containing woody vegetation with native canopy, and blade swept areas that are within 200 meters of a vegetation zone containing native canopy.
- A bat expert should be consulted about whether there are maternity sites for microbats in the area

There is no indication regarding the height of the acoustic detectors. BCS notes that there is one met mast near turbine 30, and that an acoustic detector was also located at this site in February 2021. While not included in the draft prescribed impact assessment, the spatial data indicates that this acoustic detector may have been put at a height of 30 meters. Spatial data also indicates that other acoustic detectors were placed in trees at head height, and on a stump at belt level.

BCS also notes that one of the acoustic detectors was located approximately 2.5 kilometres east of the nearest turbine (turbine 2).

BCS considers that further bat utilisation surveys are required, with acoustic detectors placed at and above the canopy height. Additional acoustic detectors should be located to cover:

- ≥ 30% of proposed turbine locations situated in vegetation zones containing woody vegetation
- ≥ 10% of proposed turbine locations situated in vegetation zones containing non-woody vegetation only

The draft prescribed impact assessment also does not state whether any bat experts were consulted about maternity or breeding sites for microbats in the area. Advice from bat experts should be included in the prescribed impact assessment.

Table 5.5 provides an indication of the likelihood of impacts to serious and irreversible impact (SAII) entities. The table includes statements that the project is not expected to result in an SAII to threatened species including Large-eared Pied Bat and Large Bent-wing Bat. The assessment states that while the site may contain foraging habitat for these species, no breeding habitat is present.

BCS notes that the bat call identification report by Echo (Appendix F1) identified a possible Large Bent-winged Bat.

Advice from a bat expert should be included in the BDAR and used to review whether an SAII assessment is required for the two bat species.

Recommendations

7.1 BCS be consulted again about bat survey methodology.

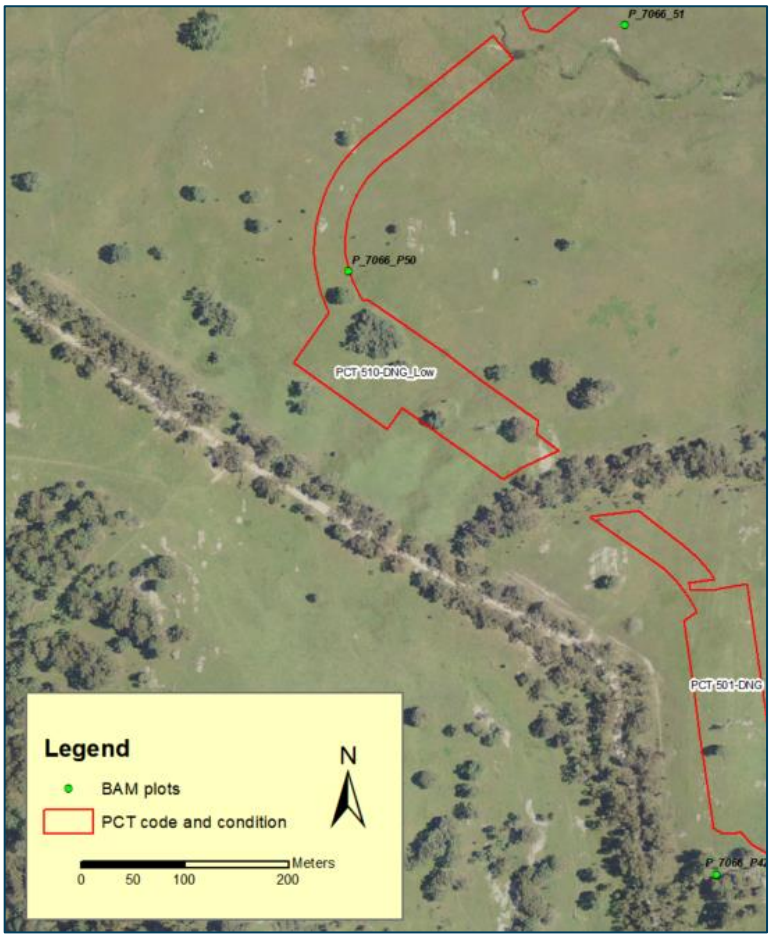
7.2 Consultation with bat experts be documented and incorporated into the bat impact assessment and used to review SAII.

7.3 Further bat utilisation surveys be conducted.

8 Mapping of derived native grassland needs review

There are areas mapped as derived native grassland (DNG) that contain trees that would be better described and assessed as woodland. For example, figure 1 shows an area mapped as PCT 510 DNG_Low which clearly has trees.

Figure 1 Example of mapping of derived native grassland (DNG)



To guide woodland mapping, *BCD North East Branch – Principles for mapping the extent of woodland critically endangered and endangered ecological communities* is provided in **Attachment C**. These principles should be applied to all areas currently mapped as DNG. Areas assessed as woodland following application of the principles should be allocated to woodland zones and biodiversity credits recalculated accordingly. Additional BAM plots may be required.

Recommendations

8.1 PCT mapping of DNG be reviewed following the *BCD North East Branch – Principles for mapping the extent of woodland critically endangered and endangered ecological communities.*

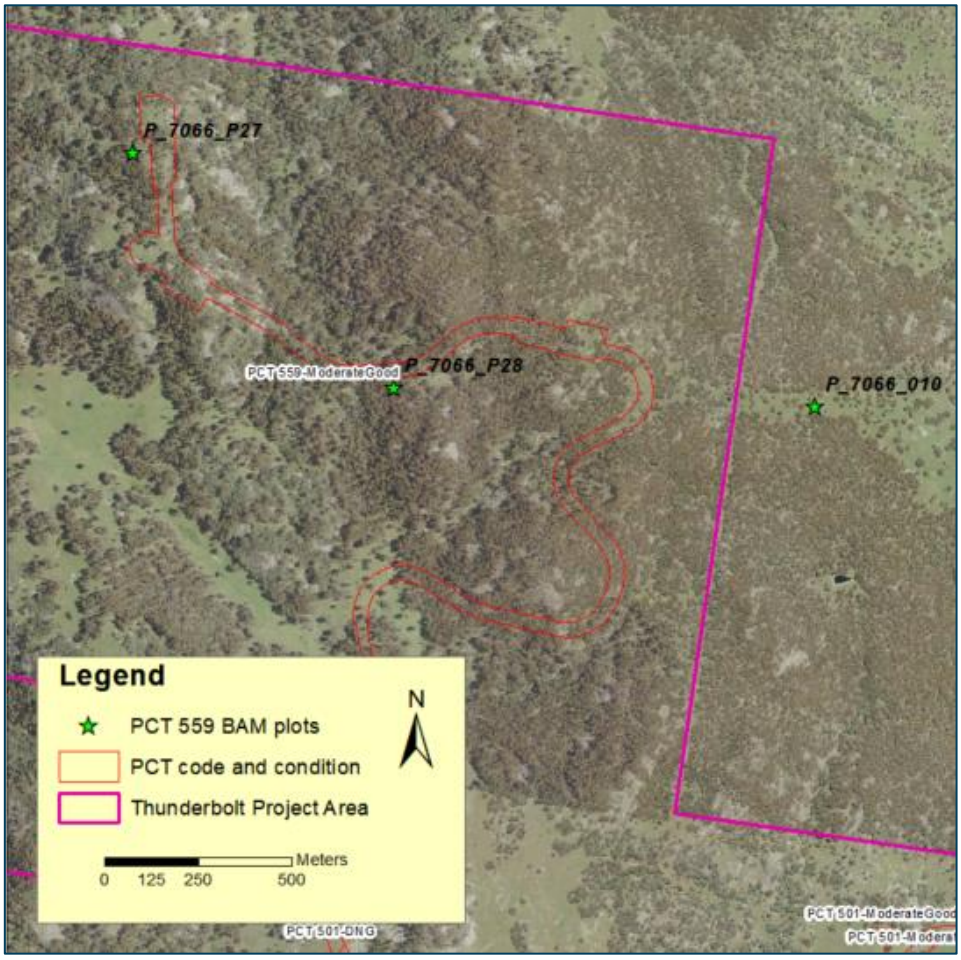
8.2 Areas assessed as woodland should be allocated to woodland zones and biodiversity credits recalculated.

9 There are some inaccuracies in the BAM Calculator and the BDAR

BCS has identified some inaccuracies and discrepancies between data in the BDAR, plot data and data entered into the BAM calculator:

- Table 3.1 of the BDAR states that the percentage of native vegetation in the 500-meter footprint buffer is 85% (this is consistent with the relevant spatial data). The site context tab of the BAM calculator has 45% entered.
- Plot P_7066_P46 in PCT 501 DNG contains trees. Examination of imagery indicates that this plot is in PCT 501 Moderate/Good. It appears that this plot has been entered into the wrong zone in the BAM calculator.
- Plot P_7066_010 in PCT 559 Moderate / Good: BAM data for this plot does not match the other two plots in this zone. An additional vegetation condition zone for PCT 559 may be required. In addition, this BAM plot has been included in the BAM calculator and the plot data spreadsheet but has not been included in the spatial file BAM_Plots_mga56.shp provided to BCS. BCS note that this plot has been located in a more open area about 400 meters east of the project footprint outside of the project area (figure 2).
- Table 1.2 of the BDAR states that the assessment type is site-based, and that it is located in Uralla local government area. The assessment type is linear (this has been selected in the BAM calculator) and is located in Tamworth local government area.

Figure 2: Location of BAM plots for PCT 559



Recommendations

9.1 Data in the BAM calculator be checked to ensure accuracy with plot data and spatial data.

9.2 Allocation of vegetation zones for PCT 559 be reviewed.

9.3 All BAM plots used for credit calculations be included in the spatial file.

9.4 The BDAR and BAM calculator be updated to incorporate changes.

10 The biodiversity credit report in the BDAR must be finalised and submitted

The biodiversity credit report provided in Appendix H of the BDAR is '*to be finalised'*.

Section 6.15(1) of the *Biodiversity Conservation Act 2016* requires that,

A biodiversity assessment report cannot be submitted in connection with a relevant application unless the accredited person certifies in the report that the report has been prepared on the basis of the requirements of (and information provided under) the Biodiversity Assessment Method as at a specified date and that date is within 14 days of the date the report is so submitted.

To meet this requirement a biodiversity development assessment report (BDAR) must be certified, for instance by signing the first page. In addition, the date of submission of the BDAR must be within 14 days of the date shown on the relevant finalised credit report generated using the BAM Calculator.

BCS is aware that the BDAR was certified on 14 March 2022 and the project case in the BAM calculator was finalised on 16 March 2022. However, a copy of the finalised credit reports has not been included in the BDAR.

Given the BDAR and BAM calculator will need to be reviewed to address errors and provide additional information and analysis, new credit reports are likely to be generated and an updated BDAR submitted.

The updated BDAR will need to have the finalised credit report included and be certified within fourteen days of the date shown on the finalised credit report.

Recommendation

10.1 The updated BDAR must include the finalised biodiversity credit reports dated within 14 days of certification of the BDAR.

Attachment C

BCD North East Branch – Principles for mapping the extent of woodland critically endangered and endangered ecological communities