

Memorandum

To	Louise Cowan (Senior Planner, AECOM)	Page	1
CC	Fiona Davies (Principal Environmental Scientist, AECOM)		
Subject	Kaimai Wind Farm - Ecological Review on Behalf of Waikato Regional Council		
From	Lyndsey Smith (Principal Ecologist, AECOM)		
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1.0 Introduction

A resource consent application has been submitted to Hauraki District Council (HDC) and Waikato Regional Council (WRC) for a project known as Kaimai Wind Farm. AECOM New Zealand Ltd is undertaking a review of the resource consent documentation submitted, on behalf of HDC and WRC, to see if it is fit for purpose. This review focuses on the documentation submitted in relation to potential ecological effects.

The documentation of relevance to this review includes:

- Project Development Rationale (Energy3, 2017)
- Assessment of Environmental Effects (AEE) (Tektus, 2018)
- Ecological Effects Assessment (Kessels Ecology, 2018)
- Supplementary Ecological Report (Ecology New Zealand, 2018)

2.0 Review

The review looked at survey design, presentation of result, interpretation of results, conclusions in relation to impacts and the approach to the development of mitigation.

The conclusions of this review are presented below in sections 2.1 - 2.10.

2.1 Methodology to Assessment

The Environment Institute of Australia and New Zealand (EIANZ) produced the Ecological Impact Assessment Guidelines for use in New Zealand: terrestrial and freshwater systems (1st edition 2015, 2nd edition 2018). The guidelines provide a framework for assessment that aims to:

- Improve the scientific rigour, objectivity and consistency of Ecological Impact Assessment (EclA).
- Assist consultants and officers in local and central government working with AEEs.
- Improve community confidence in the ability of professionals to undertake impartial assessments.
- Guide policy around biodiversity management.
- Contribute to better decision-making on environmental matters.

The Ecological Effects Assessment (and subsequently the Supplementary Ecological Report) has not followed the EIANZ guidelines. This has meant that the assessment process is not clear, stages of the assessment have been missed and conclusions are made without clarity around how these have been reached.

2.1.1 Scoping

The Ecological Effects Assessment indicates on page 11 that a Scoping Report Analysis was undertaken but a Scoping Report is not provided within the documentation submitted to Council. This

documentation may provide clarity to the reader around decisions made in relation to the ecological survey methodology.

2.2 Consultation

The AEE in section 4.2 indicates that the Department of Conservation (DOC), HDC and Waikato Regional Council (WRC) were consulted in relation to the development. It goes on to indicate that DOC commented on the monitoring design and were then given an opportunity to comment on the ecology report. The Ecological Effects Assessment does not present any of the responses received from these scoping discussions. Therefore, the reader does not know whether information obtained during consultation with DOC, and other organisations, was integrated into the survey design and subsequently project design.

2.3 Plans and Policies

The Ecological Effects Assessment includes a section titled Policy Context in section 1.3. However, this section is very high level and does not go into detail about the legislation, plans and policies for which the EclA is aiming to provide evidence that the proposed project is compliant.

2.4 Description of Existing Environment

2.4.1 Study Area

The Ecology Effects Assessment does not clearly indicate (e.g. map), what it considers to be the extent of the project and what is considered to be the study area. The zone of influence of a project on ecology will depend on the species being studied, therefore it is important to consider the potential impact zone and then develop a survey approach around this.

2.4.2 Desk Study

The reporting indicates that a desk study was undertaken, but there is no clear presentation of this information. Information relating to the desk study is presented in the field results and within the assessment of effects. This is particularly relevant in relation to birds, where the assessment of effects presents migratory bird information to justify conclusions but this information is not presented previously without interpretation.

The desk study does not indicate that the bat database held by DOC was consulted. This may in part be because the database does not hold records for long-tailed bats or short-tailed bats within the vicinity of the proposed project. However, this is important to discuss as it illustrates that prior to the windfarm development limited research has been undertaken in relation to the local population of bats. If this is the case, the survey approach would need to be robust to gain a good understanding of the local bat populations.

2.4.3 Survey Methodologies

It is acknowledged that there are no guidelines within New Zealand as to the level of effort that is required for the completion of ecological surveys for windfarms. However, international guidelines exist and have been developed in response to the particular issues caused by windfarm developments (e.g. Rodrigues *et al.*, 2014, BCT, 2016, SNH, 2014). It is not evident from the Ecological Effects Assessment that consideration was given to international best practice.

The text below illustrates questions/concerns in relation to survey design.

Bat surveys – Key aspects of survey design include where you will monitor, how you will monitor and when you will monitor.

Where you monitor?

As indicated in section 2.3.1 of this review there is no clear indication of the study area in relation to bats and subsequently why automatic bat monitors (ABMs) were placed in particular areas in the landscape.

The numbering of ABMs differs within the Ecological Effects Assessment report and the Supplementary Report, even though the Supplementary Report indicates that some of the ABM locations were similar. This does not aid the reader when trying to interpret the data.

Bat detectors presented in Figure 8 of the Ecological Effects Assessment are not cross referenced to Table 3 and vice versa, including KS3, KS8, B12, K8, K12, K3 and B12.

How you will monitor?

Bats are monitored solely using ABMs. These provide valuable data as they allow monitoring to occur over a long period of time, but they remove a human's ability to interpret the behaviour that they are seeing. This is why in Europe/America monitoring of bats in relation to windfarms is typically a combination of transects and ABM monitoring.

The methodology does not indicate the height at which ABMs were placed. This is important due to the detection range of the ABMs and because bats can fly at a range of heights depending on their activity (e.g. social, commuting etc.) or due to the availability of resources (e.g. climate effects where insects occur in the air column). Bat activity should, where possible be recorded at the height of the collision zone.

The surveys did not include an assessment of bat roosts within impacted trees. The Supplementary Bat Report indicates that for the construction of a wind turbine 13 trees will need to be removed and that there are trees in this stand with bat roost potential. However, no assessment is undertaken as to the quantify of suitable trees present and whether further survey should be undertaken to understand usage. The rotors of turbines 21, 22, 23, 15 and 11 extend over the top of the adjacent forest, but there is no direct assessment of the potential for these trees to support roosting bats.

When will you monitor?

Bat activity surveys should take account of the full lifecycle of a bat and seasonal variation. This is because bats will change the areas that they forage depending on whether they are developing their energy stores, in a maternity roost, mating or entering periods of torpor/hibernation. In addition, bats will exploit changing invertebrate resources e.g. moving into an area to take advantage of temporal resources. The location of those invertebrate resources will also change in relation to climatic conditions.

The bat surveys completed by Kessels and Ecology New Zealand collected data in;

- January 2013
- September – October 2015
- March – April 2018

New Zealand bats are active throughout the year, although activity is connected to temperature, with bats less active at lower temperatures (Daniel & Williams, 1984). Therefore, it is considered that monitoring should take place during warmer periods from November – April during the bat peak activity period (Borkin, 2010).

The data collected in Sept / Oct was collected outside of the peak bat activity period and may mean that negative detections during this period cannot be relied upon. In addition, each of the surveys only took a snap shot of the bat activity period, none of the surveys looked at how activity changed through a single bat active period (November – April).

The data collected by Kessels is considered too old and the data collected in 2018 is focused at the end of the bat active period. As a result, the data collected may not give a full picture as to how bats are using the local environment.

Bird Surveys - Key aspects of survey design include where you will monitor, how you will monitor and when you will monitor

Where will you monitor?

It is not clear from the methodology and associated maps the area that was covered by each of the survey techniques (e.g. view / range). This is particularly relevant in relation to the vantage point surveys.

How will you monitor?

The methods do not clearly indicate which species each of the survey methodologies is trying to target and the key seasons required for the monitoring of these species.

In relation to the vantage point counts, the method differs to that used within Europe for the detection of bird species in connection with windfarms and it is not clear from the methods presented why these are following the 5 minute bird protocol rather than the standard windfarm methodology.

The detection of migratory birds appears to have been dependent on acoustic monitoring. It is not clear from the methodology whether vantage point surveys were also focused on periods when migratory species would be passing over the site.

When will you monitor?

It is not clear from the methodology the months that the different types of bird surveys were completed e.g. vantage point counts were completed in 2013 and 2015 but there is no indication of the month or species targeted.

It is also not clear if the surveys were focusing on periods when species are most active e.g. migration at dawn and dusk between foraging and roosting areas.

Reptiles

The risk of the presence of reptiles is indicated in the Ecological Effects Assessment and the Supplementary Ecological Report. The reports indicate the potential presence of threatened species within the footprint of the development e.g. section 4.3.2 'striped skink could occur in vegetation within the windfarms construction footprint' however a lizard survey is not recommended or undertaken.

Freshwater Habitats and Fish

The assessment of impacts from the upgrade of eight culverts on the receiving freshwater environment is included in the Supplementary Ecological Report. The Ecological Effects Assessment did not assess the effects on freshwater environments because the design at that time did not include additional culverts or the alteration of existing culverts.

On review of the AEE and the Supplementary Ecological Report there are a number of questions in relation to the proposed works which would influence the nature of surveys and conclusions in relation to the impact assessment;

- The AEE and the Supplementary Ecological Report indicate that eight culverts require an upgrade. The AEE states that one stream (Romaru Stream) will be affected by the culvert upgrades (section 8.8.5) and then in section 7.5.8 states that there are two instream culverts. The AEE suggests that the remainder of the culverts are for surface water only and therefore not relevant to the ecological assessment. The Supplementary Ecological Report states four streams are affected by the culvert upgrades, but does not indicate how each of these will be impacted. Further clarity is required in the Supplementary Ecological Report as to which streams are considered to be impacted by works.
- It is not clear from the Supplementary Ecological Report or the AEE if the footprint of the upgraded culverts will remain the same as is currently present on site.
- The Supplementary Ecological Report indicates that culverts may be perched. If this is the case, will instream works be required downstream, such as the installation of riprap or similar material to dissipate the energy of water leaving the culvert? These works are likely to be localised, but it is not evident from the ecological assessment if this has been considered.
- It is not evident from the Supplementary Ecological Report whether a walkover/survey was undertaken to assess the quality of the stream habitat that would be impacted by works. A stream survey was not completed to inform the Ecological Effects Assessment.
- The Supplementary Ecological Report indicates that the four streams on site have not been surveyed extensively; therefore fish diversity is largely unknown. The report goes on to indicate that the assessment will not exclude the potential presence of all local fish species. It is not clear what is meant by local fish species. Was a desk study undertaken for this assessment? Can this information be presented within the report?

The Ecological Effects Assessment presents fish records that would be relevant to the Supplementary Ecological Report but there is no cross reference to this information in the

Supplementary Ecological Report. In addition, the two reports make reference to different streams.

- A clear presentation of the desk study is required along with the scale of works being assessed. This would assist in the decision making as to whether a electrofishing surveys is required.

2.5 Results

As indicated in section 2.4.2 of this review, it would be beneficial if there was a clear separation between desk study information and field survey information. This separation will highlight where the Effects Assessment has not presented all of the species desk study data (e.g. migratory birds) and highlight where there are gaps in existing knowledge that are then filled by the survey works completed for the project.

Vegetation – Table 4 calculates total vegetation coverage within the windfarm property. The extent of the windfarm property is not presented on any of the figures in the report.

Threatened flora – No figure illustrating the distribution of the threatened plant species presented in Table 6. This means the reader has no understanding of the risk of these species being present within the development footprint.

Avifauna - clear presentation of desk study information would help illustrate what the field surveys identified and highlight if there are gaps in knowledge.

The vantage point bird surveys should show the location of bird species on a map. The purpose of this would be to gain an understanding of how birds are moving through the landscape.

The bioacoustics data indicates that two flocks of south island pied oystercatchers crossed over the site. How is it known that more than one bird was present? Which detectors picked up the birds? Table 17 has the bird monitoring locations numbered but Figure 4 does not present this numbering.

Bats – Not all monitoring sites are included in Figure 7.

The consolidation of results in to a mean in the Ecological Effects Assessment and the Supplementary Ecology Report prevents the reader seeing if there were particular peaks in activity. A mean bat pass rate of 1 per night would be low and yet the report discussed high bat activity. Therefore, has the presentation of data masked this activity? Due to the quantity of data involved when studying windfarms it is typical that the EclA would be supported by separate species reports, therefore, if required the reader can refer to more detailed information.

Section 3.1 of the AEE indicates that the scale of the windfarm was adjusted to avoid high bat activity areas. However, as the results are presented between the two ecology reports it appears that the level of bat activity is actually higher adjacent to some of the turbines that are still in the scheme and located over forest habitat (Turbine 9, 22 & 23).

As indicated in section 2.4.3 the number of bat monitoring sites differs between reports and cross referencing between tables and figures is inaccurate.

Lizards – The risk of threatened skink species being present is identified in the ecology reports but no survey is recommended in the Ecology Effects Assessment. In the Supplementary Report a search of natural refugia is completed and copper skink is identified, but still a detailed reptile survey is not recommended. Therefore, the impact assessment is not based on survey data.

The report makes reference to the presence of records of reptiles locally, but does not present this information on a map. Therefore, the reader does not understand if these species are adjacent to site or just in the wider area.

Freshwater habitat and fish – The Supplementary Ecological Report suggests that a desk study was undertaken and that the assessment is completed based on this information (e.g. local fish). However, the results of the desk study are not presented nor is there a cross reference to information presented in the Ecological Effects Assessment. It appears from the information presented that a walkover to assess the quality of the impacted stream habitat was not undertaken.

2.6 Evaluation

An EclA should include a section that confirms the species and habitats that are known to be present or likely to be present and assign a value to them. Valuation can be undertaken in a number of ways and in the Ecological Effects Assessment the significance of indigenous biodiversity criteria from the Regional Policy Statement (RPS) was selected.

It is not clear how the significance test has then been undertaken. It appears from Table 13 that the test was run against the features of the adjacent Conservation Park, not necessarily the findings of the survey works. It is acknowledged that the Conservation Park does fall within the project area as the turbine blades do extend into this Conservation Area, but it is unclear how the presence of long-tailed bats factored into the significance test, at this stage of the assessment.

In the assessment of effects the significance of the bat population is discussed in section 6.5.1, but this assessment is not undertaken for other species.

The Supplementary Ecological Report does not include any assessment of the value of the streams to be impacted.

2.7 Assessment of Effects

The Ecological Effects Assessment does not follow current guidance (EIANZ, 2015 & 2018) therefore the assessment of effects is not comprehensive.

It is typical to consider the effect of development during the construction, operation and preferably decommissioning. The Ecological Effects Assessment does not separate the assessment of effects per stage of development; therefore, the nature of impacts is not presented for each stage.

The Effects Assessment does not identify at the start of the assessment the works that are to be considered and this leads to potential routes of impact being forgotten by the assessment e.g. the development includes the installation of a substation with lattice transmission towers and overhead power cables and these are not considered/referred to in the assessment of effects. It may be possible that these structures could provide additional strike risk for birds.

There is no assessment of effects prior to mitigation as is normal practice within an EclA e.g. Table 14 presents assessment of effects after avoidance, remediation or mitigation. It is best practice to gain an understanding of the scale of impact without mitigation as this then allows the assessor to understand the impacts that need to be mitigated and the scale at which this is required.

The Supplementary Ecological Report looks at the majority of impacts that could occur as a result of the upgrade of culverts, but it is not clear what the value of the impacted streams are, the footprint of the works and whether culverts are perched. This affects the readers understanding of the scale of impact of the works. In addition, the conclusion states that works will lead to an improvement because works will improve fish passage. Where on site was fish passage restricted and what area of stream do the culvert upgrade works create access to?

2.8 Mitigation

EclA requires that impacts are identified prior to mitigation. This does not occur in the Ecological Effects Assessment. Therefore, mitigation is presented within the Effects Assessment.

It is unclear as to how this project has followed the mitigation hierarchy; avoid, reduce, mitigate, offset and then finally compensate. It appears from the information provided that compensation is the main route of mitigation?

The key factor to ensuring that a windfarm does not have a significant impact on ecology is the positioning of the windfarm. The documentation provided does not indicate how avoidance of impacts has been incorporated into the design of the windfarm in relation to specific aspects of ecology.

Although research in New Zealand is limited in relation to the effects of windfarms on bats it is not within Europe and America. Best practice guidelines indicate that windfarm turbines should be located 200m from a forest edge (tip of blade should be 200m from forest) to avoid significant impacts to bats (Rodrigues 2014). It is recommended that this international best practice is considered and commented upon due to the presence of a threatened bat species adjacent to a forest edge.

The Supplementary Ecological Report indicates a number of mitigation requirements that are in line with current practice. It would be useful to know if the culverts within the 1-2 streams highlighted by the AEE will be perched. Will there be loss of stream length or any instream works? The Supplementary Ecological Report indicates that stream restoration would be undertaken in the headwaters and streams fenced. This is also stated in the AEE in section 7.5.6. There is no indication as to where this will occur and the scale of works. It is not evident as to whether this is mitigation for impacts, enhancement works or compensation for other effects of the development.

2.9 Assessment of Residual Effects

It is good practice after the implementation of mitigation to assess residual effects. This assessment is presented in part within the assessment of effects, however, it is not always clear as to how the conclusions have been reached.

The Ecological Effects Assessment does not include a summary table of residual effects. However, one is presented within the Supplementary Ecology Report, which is then represented within the Assessment of Environmental Effects.

In the Ecological Effects Assessment it states that 'after mitigation effects on bat mortality are uncertain'. However, in Table 3 of the Supplementary Ecology Report it is indicated that residual impacts are non-significant with uncertainty.

It is unclear how the Supplementary Ecology Report can present an assessment of residual ecological effects as this document is not an EIA and has not gone through the assessment process.

2.10 Conclusion

The information submitted to date is not fit for purpose.

- It is not clear from the information provided that the survey design has been appropriate to establish the true ecological baseline for the site.
- A clear evaluation of the value of habitats and species on site has not been completed.
- The impact assessment does not consider impacts from all aspects or stages of the development.
- The impact assessment is not completed prior to mitigation.
- The mitigation does not present how the development has worked through the mitigation hierarchy to reach proposed mitigation for each of the species and habitats that are significantly impacted.
- There is no clear assessment of residual impacts post mitigation.

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