# Haldon Solar [FTAA-2508-1097]

## Forest & Bird comments on draft MDC conditions

**General comment:**

The draft Mackenzie District Council (MDC) conditions rely on certification of various management plans by the Mackenzie District Council. However, it is unclear whether Mackenzie District Council has the resources and expertise necessary to fulfil this function. For example, condition 114 requires Mackenzie District Council to certify the Avifauna Management Plan, which must be prepared in accordance with condition 113. This may require the certifying authority to assess the reasons given by the applicant for not addressing issues that have been raised by the Department of Conservation. A similar issue arises in relation to conditions 118 and 199 (re. the Bird Collision Monitoring Plan). Fulfilling these functions may require technical expertise. Throughout the application process, Mackenzie District Council has relied on the expertise of Canterbury Regional Council (ECan) in regard to all ecological aspects of the proposal. It would therefore make sense for ECan to be the certifying authority in relation to ecological management plans.

To ensure transparency, and to enhance the value of the long-term applied research programme the applicant has committed to, Forest & Bird recommends an additional condition ensuring that all ecological management plans (including specific management plans relating to terrestrial ecology, invertebrates, lizards, avifauna etc.) for the Project are made publicly available, e.g. by ECan as certifying authority.

**Comments on specific conditions:**

| | **Draft condition** | | **F&B comments** |
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| 1. | 62 | The purpose of the Ecological Management Plan is to set out the response methods and management procedures to be implemented on site so as to avoid, remedy or mitigate potential adverse effects, and where required, offset and compensate for residual adverse ecological effects during the construction and operation of the solar farm. | The accepted approach to management plans is for the conditions to set out the parameters that must be met, with the management plan setting out how that will be achieved. Condition 62 does not comply with this requirement as it just says avoid remedy or mitigate adverse effects. |

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| | | To achieve this purpose, the Ecological Management Plan must:<br>a) include records of engagement with the Department of Conservation in relation to the development of the Ecological Management Plan, including details of how issues raised by the Department of Conservation have been addressed or reasons why they are not addressed;<br>b) set out the approach that has been taken to the management of effects, including in relation to applied research, monitoring, adaptive management and fall-back effects management actions in the event that predicted ecological outcomes are not achieved;<br>c) provide a summary of the ecological values assessments that have been undertaken and identify potential effects arising from the construction and operation of the solar farm;<br>d) set out how effects are to be managed on:<br>i. the outwash ecosystem;<br>ii. lizards;<br>iii. Threatened and At-risk plants;<br>iv. Threatened and At-risk invertebrates; and<br>v. avifauna.<br><br>The Ecological Management Plan must also set out:<br><br>e) Ecological objective and outcomes<br>f) Measures to avoid or minimise/mitigate or rehabilitate adverse ecological effects associated with Project activities<br>g) day to day ecological management for the solar farm site, the conservation / release areas and the compensation area;<br>h) Indigenous planting methods within the Solar farm and Compensation Area and conservation/release areas including ecosourcing and seed collection, plant propagation, site preparation, planting specifications, and planting maintenance and monitoring, outcome targets and adaptive management and contingency actions as required. | The "ecological objective and outcomes" referred to in condition 62(e) need to be specified in the consent condition.<br><br>For example, the applicant has stated that the Project aims to achieve 'no net loss' outcomes for biodiversity and ecology (draft decision at [172] and [221]). This 'no net loss' objective should be stated in condition 62.<br><br>Forest & Bird understands that the Panel has relied on the applicant's 'no net loss' position in making its draft decision. If the applicant does not consider this outcome to be possible, or appropriate, then the draft decision would need to be reconsidered.<br><br>The applicant has also stated that it intends to avoid direct loss of, and shading effects on, Nationally Threatened plants (draft decision at [212] and [220]). This avoidance objective should also be stated in condition 62. |

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| | | i) Weed management within the Solar farm site and compensation area, including target species, control methods and targets and monitoring and adaptive management actions ;<br>j) pest animal management, including fencing requirements and animal control elimination or reduction targets as set out in the Pest Animal Management Plan;<br>k) Applied research, monitoring and reporting commitments, including establishment of a Technical Review Panel;<br>l) compensation programme including triggers and applied research and monitoring to verify that ecological outcomes have been achieved;<br>m) roles and responsibilities; and<br>n) timeframes for implementing and reviewing the Ecological Management Plan | |
| 2. | 66 | The Consent Holder must establish a Technical Review Panel comprising representation from the Kaitiaki Governance Group, Mackenzie District Council, Canterbury Regional Council and the Department of Conservation prior to the commencement of construction works on the solar farm.<br><br>Meetings of the Technical Review Panel must be convened at the initiation of solar farm operation (the first generation of electricity), and the first, second, fifth and tenth anniversaries of the solar farm operations for the following purposes:<br>a) to develop the applied ecological research programme and to administer the approval process for funding of applied ecological research<br>b) to review the results from ecological monitoring and applied ecological research undertaken in accordance with the requirements of this consent;<br>c) to recommend amendments to ecological management plans and ecological monitoring programmes arising from the review of ecological monitoring results; and | The proposition is that the Technical Review Group can determine additional compensation that might be required in response to residual adverse effects identified by monitoring and research.<br><br>For this to be acceptable as a consent condition, the Panel would need to provide a method and criteria for assessment stipulating how the additional compensation is to be calculated. Simply providing for a determination of additional compensation without any guidance is likely to constitute an unlawful delegation of the Panel's decision-making powers. The quantum of compensation must be a matter critical to the grant of consent, which cannot therefore be delegated.<br><br>Another problem with this proposed consent condition relates to the advice note that the "… |

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| | | d) to review and confirm compensation recommendations should any of the avifauna adaptive management triggers set out in condition 121 be reached.<br><br>In addition to the above, on the tenth anniversary of solar farm operations, and based on a further review of the outcomes of all monitoring and mitigation undertaken as required by this consent, the Technical Review Panel must make a final determination on any requirement for ecological compensation in response to any residual ecological effects from the construction and operation of the solar farm that have not been avoided, mitigated or offset.<br><br>The scale and nature of any compensation determined by the Technical Review Panel must be commensurate with the actual residual impacts that have been identified and will be binding on the Consent Holder.<br>The Technical Review Panel must design and administer a programme of statistically robust applied ecological research and monitoring designed to improve the knowledge and understanding of effects of solar development in dryland environments, including:<br>a) the effects of panel shading and associated microclimatic change on dryland vegetation, Threatened and At Risk plant species, and basking and other open-habitat invertebrates;<br>b) the efficacy of salvage, propagation, translocation and relocation of Threatened and At Risk plants and invertebrates;<br>c) bird-strike collision rates and mechanisms, and the reliability of the carcass-detection methodologies; and<br>d) the ecological gains actually delivered by providing a compensation area, predator-exclusion fencing and pest management (including reduction and control).<br><br>The Applied Research Programme must include independent peer review of research methods and reporting, have access to all monitoring data and | compensation elements of this condition were proposed on an Augier basis by the Applicant", and the fact that the compensation sum referred to in condition 124 was also proposed on an Augier basis. The problem is that, if compensation must be volunteered by the applicant, how can the Technical Review Group "determine" it?<br><br>Consistent with our comments on condition 62, above, the determination as to any further ecological compensation should refer to the standard of effects management that is expected from the applicant, e.g. refer not merely to effects "that have not been avoided, mitigated or offset", but rather to effects "that have not been avoided, mitigated or offset so as to achieve no net loss". |

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| | | reporting required by conditions of this consent, and publication where appropriate.<br><br>***Advice Note:*** *The Kaitiaki Governance Group, Mackenzie District Council, Canterbury Regional Council and/or the Department of Conservation may appoint an independent expert on their behalf to fulfil this role.*<br><br>***Advice Note:*** *Technical Review Panel and compensation elements of this condition were proposed on an Augier basis by the Applicant.*<br><br>***Advice Note:*** *If representatives invited to participate in the Technical Review Panel advise the Consent Holder that they do not wish to participate, the Consent Holder will not be deemed non-compliant with this condition. For the avoidance of doubt, the Consent Holder must still demonstrate that reasonable steps have been taken to invite the participants in accordance with this condition.* | |
| 3. | 87 | [Pre-construction baseline monitoring plan for Nationally Threatened or At-risk dry-land plants within the solar farm and Compensation Area] | Forest & Bird agrees that the proposed further pre-construction monitoring is needed, given the lack of pre-application monitoring. However, we are concerned that achieving adequate monitoring will be highly dependent on the applicant engaging an ecologist with the necessary qualifications and experience to carry out this work. To ensure this is done properly, and to avoid the duplication of efforts seen during the application process, we recommend that the wording of the condition is amended slightly to ensure that DOC can approve a suitable expert:<br><br>"Prior to the construction of the Solar Farm, the Consent Holder must engage a suitably qualified |

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| | | | and experienced ecologist approved by the Department of Conservation to prepare, in consultation with the Department of Conservation, a statistically robust pre-construction baseline monitoring plan for Nationally Threatened or At-risk dry-land plants within the solar farm and Compensation Area in accordance with the requirements of the Plant Management Plan" |
| 4. | 89 | Where Nationally Threatened plant species are located within the solar farm, the location of those species along with an appropriate (10m) buffer must be avoided in the solar farm layout and permanently fenced using a standard stock exclusion fence. | Forest & Bird agrees that adverse effects on identified Threatened plants should be avoided. Creating a 10m buffer zone around these plants using a stock exclusion fence would go some way towards achieving this.<br><br>The Panel may wish to specify that this condition is being imposed as an adaptive management response to the gaps in environmental baseline information provided by the applicant. This explanation may become relevant if the further monitoring identifies Threatened plants at a density that would require substantial changes to the number and/or configuration of solar panels that can be accommodated at the Project site. |
| 5. | 113 | The purpose of the Avifauna Management Plan is to set out the response methods and management procedures to be implemented on site so as to achieve no net loss of Threatened or At-risk avifauna species during the construction and operation of the solar farm.<br><br>To achieve this purpose, the Avifauna Management Plan must include: | Under condition 113(g), Forest & Bird recommends that the review of the Avifauna Management Plan should specifically include a review of new technologies to reduce bird collisions with panels. This review should occur on a regular basis – for example, every two years. |

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| | | a) records of engagement with the Department of Conservation in relation to the development of the Avifauna Management Plan, including details of how issues raised by the Department of Conservation have been addressed or reasons why they are not addressed;<br>b) design features of the solar farm that mitigate potential effects on birds, including panel tracking and stowing angles and management of lighting;<br>c) identification of bird species that are likely to use or interact with both the solar farm site and Compensation Area, and monitoring methodologies and frequencies to determine that use or interaction;<br>d) methods for identifying nesting bird behaviours and protocols to minimise their disturbance when identified;<br>e) details of the collision mortality thresholds and response actions required in accordance with Condition 121;<br>f) requirements for reporting; and<br>g) the review and evaluation of the Avifauna Management Plan. | |
| 6. | 119 | The purpose of the Bird Collision monitoring is to:<br>a) minimise the risk of bird collision with Solar Farm Infrastructure;<br>b) contribute to scientific knowledge of Threatened or At-risk avifauna species and their potential behavioural response to solar panels; and<br>c) detect as best as possible the nature and extent of any collision of birds (in particular Threatened or At-risk avifauna species likely to be present on and around the Site) with Solar Farm infrastructure (particularly solar panels) leading to death or injury.<br><br>To achieve this purpose, the Bird Collision Monitoring Plan must reference the methods identified in *Statistical advice for a solar power installation at Haldon Station, Canterbury, New Zealand* prepared by Proteus provided as part of the applications and incorporate a monitoring design and | Forest & Bird considers that consent conditions should ensure there is transparency around the reasons given for departing from DOC advice. This advice is relied upon to ensure collision monitoring is done well. If the applicant does not implement DOC advice, and MDC (or potentially another certifying authority, see general comment above) nonetheless decides to certify the management plan, the reasons for certifying need to be transparent to ensure that DOC's advice is not buried. As well as being important for ensuring the management plans for the Project are robust, this is also important in terms of the value of the long-term |

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| | | methodologies for avifauna mortality surveys that inform the species-specific adaptive management triggers set out in Condition 121 , including:<br>a) records of engagement with the Department of Conservation in relation to the development of the Bird Collision Monitoring Plan, including details of how issues raised by the Department of Conservation have been addressed or reasons why they are not addressed;<br>b) industry-standard design measures to be employed to avoid or minimise avifauna collisions with Solar Farm Infrastructure;<br>c) a monitoring programme design that includes:<br>i. a methodology that provides for a detection probability of carcasses of at least 95 % likelihood for both large and small birds (separately) based on the Proteus advice;<br>ii. the quantification of the abundance and identity of any bird carcasses found within the site through survey of a statistically representative portion of the solar farm site and set intervals;<br>iii. pre-and post-construction searcher efficiency trials that assess observer detection of carcasses in the field including how manual human search, drone search or dog detection methods will be used, trialled, benchmarked and applied at the site to achieve the minimum target carcass detection level of 95%; and<br>iv. carcass persistence trials that determine how detection probability changes over time as carcasses are scavenged or decay;<br>d) requirements for reporting; and<br>e) the review and evaluation of the Bird Collision Monitoring Plan. | applied research programme which the applicant has committed to.<br><br>Forest & Bird recommends a condition requiring the various management plans to be made publicly available, together with a clear and distinct condition requiring the Bird Collision Monitoring Plan itself to expressly state any issues raised by DOC that have not been addressed by the applicant, and the reasons why these issues have not been addressed. For example:<br><br>a) records of engagement with the Department of Conservation in relation to the development of the Bird Collision Monitoring Plan, including details of how issues raised by the Department of Conservation have been addressed;<br>b) details of each of the issues (if any) raised by the Department of Conservation that have not been addressed, together with ~~or~~ reasons why they are not addressed;<br><br>The 95% carcass-detection standard has been proposed by the applicant (draft decision at [252]) and has been relied on by the Panel (draft decision at [263]). Forest & Bird agrees that this high standard is appropriate given the Threatened or At-risk status of numerous species of birds present at and around the Project site and taking a precautionary approach to uncertainty in relation to adverse effects. |

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| | | | However, Forest & Bird does have concerns that the 95% carcass-detection standard will be difficult for the applicant to achieve in practice. Proteus stated on multiple occasions that requiring high detection probabilities for small birds will demand a very intensive monitoring design. They undertook thousands of simulations based on five variables:<br>• site coverage by surveys, values of 6.25%, 12.5%, 25% and 50% of the site<br>• survey intervals, values of 4, 7, 14, and 28 days<br>• mortality rates, values of 1, 10, 50, and 100 birds per size class per year (not species)<br>• searcher efficiency, for each of small, medium and large size classes. For small size classes, the values were 30%, 40% and 50% detection – not even close to 95% detection<br>• carcass persistence (probability that a carcass persists from one day to the next), also done for each of small, medium and large size classes. For small size classes, the values modelled were 78%, 87% and 93%.<br><br>Our interpretation of the Proteus simulations is that, if mortality of small birds is low (10 birds per size class per year), and 50% of the site is surveyed every four days, the probability of finding one or more carcasses (of the 10 deaths) is close to 95%. However, for even lower mortality rates (and for kaki, for example, a mortality rate of 1 bird per year would be a significant matter of concern), it becomes even harder to achieve this carcass-detection standard. |

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| | | | If the applicant does not consider this standard to be achievable, or appropriate, then the draft approval would need to be reconsidered. |
| 7. | 120 | The Consent Holder must undertake the monitoring required by the Bird Collision Monitoring Plan for a period of not less than five years or five full seasonal monitoring periods from commencement of the installation of solar panels and ancillary infrastructure within the site. | The proposed five-year timeframe needs to be able to be altered if collisions are still occurring despite mitigation. Collision monitoring should continue for not less than five full years, <u>after which monitoring may cease once a full seasonal monitoring period has elapsed with no mortality thresholds being triggered</u>. |
| 8. | 121 | [Adaptive management triggers for avifauna mortality] | Forest & Bird agrees with the proposed mortality thresholds for avifauna. |
| 9. | 122 | In the event that Bird Collision monitoring identifies that a mortality of any individual bird species listed in Condition 121 the following will apply:<br>a) the Consent Holder must notify the Department of Conservation, Te Rūnanga o Arowhenua; Te Rūnanga o Waihao; and Te Rūnanga o Moeraki, and the Mackenzie District Council within 48 hours of becoming aware of the exceedance;<br>b) the suitably qualified and experienced person engaged for purposes of establishing the avifauna monitoring at the Haldon Solar Farm must undertake an investigation and complete a draft report on the possible cause of bird mortality within 15 working days of the Consent Holder notifying of the exceedance. This report must:<br>i. identify whether any additional monitoring or investigation is required to further determine the potential cause of bird mortality;<br>ii. provide details of any collision prevention / deterrent measures that could be applied; and | This condition requires investigation of monitoring and possible mitigation measures should thresholds be met or exceeded but requires no implementation.<br><br>Condition 123 is concerned with compensation in circumstance where "implementation of further mitigation measures have not prevented ongoing bird strike".<br><br>Condition 122 therefore also needs to require **implementation by the applicant** of mitigation measures, before potentially moving on to compensation (condition 123) if these measures are not effective. |

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| | | c) the draft report must be immediately provided to Te Rūnanga o Arowhenua; Te Rūnanga o Waihao; and Te Rūnanga o Moeraki; the Department of Conservation for review and comment; and<br>d) the Consent Holder must submit the report (including any comments from Te Rūnanga o Arowhenua; Te Rūnanga o Waihao; and Te Rūnanga o Moeraki and the Department of Conservation and the Consent Holder's response to those comments) to the Mackenzie District Council for certification within 15 working days of provision of the draft report. A copy of the final report must also be provided to Te Rūnanga o Arowhenua; Te Rūnanga o Waihao; and Te Rūnanga o Moeraki, and the Department of Conservation. | |
| 10. | 123 | If Bird Collision monitoring identifies that the mortality of any individual bird species listed in Condition 121has equalled or exceeded the Adaptive Management Trigger for that individual species as a result of interactions with the solar installation, and the implementation of further mitigation measures have not prevented ongoing bird strike, then compensation of the following nature will apply:<br>a) engagement with the Department of Conservation to identify targeted opportunities to further improve survival and breeding success of threatened and at-risk avifauna species; and<br>b) assessment and quantification of the potential population benefits that could be achieved through additional investment in existing recovery programmes and management actions, which may include:<br>i. expanding the intensity and spatial extent of predator control;<br>ii. GPS tracking to better understand movement patterns and identify causes of mortality;<br>iii. habitat enhancement measures, including pest plant control;<br>iv. installation of markers to improve visibility of existing electrical transmission lines to reduce collision risk. | If mitigation fails to prevent bird mortality, then compensation is required. The condition should refer to the thresholds rather than its present wording of "ongoing bird strike".<br><br>The intended process appears to be: mortality threshold is triggered, mitigation is implemented, the threshold is triggered again, compensation is required. Is it the same threshold i.e. a kaki is killed, then another kaki is killed? Can it be a different Nationally Critical species? Kaki then kotuku? Or can it be a different threshold e.g. a kaki is killed, mitigation is implemented, then two crested grebes are killed? This needs to be clarified/specified.<br><br>Both (a) and (b) refer to engagement and assessment but again, there is no mention of **implementation by the applicant** of compensation actions. |

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| | | ***Advice note:*** *Avifauna compensation may provide for implementation by the Department of Conservation*. | The problem of how additional compensation would be quantified and imposed has been raised above under condition 66. |
| 11. | 124 | The Consent Holder's financial contribution to avifauna compensation shall comprise a payment of $1,000,000 (CPI adjusted from 1 July 2026) to the Department of Conservation for the loss of avifauna habitat and residual risk of avifauna collision with solar farm infrastructure, payable on or before the first day of commencement of physical works on site. Payment of the specified financial contributions shall constitute full and final satisfaction of the Consent Holder's obligations under this condition.<br><br>***Advice note:*** *This condition has been proposed on an Augier basis by the Applicant*. | A similar problem with quantification of compensation arises under proposed condition 124. Setting compensation as a monetary donation to DOC without ensuring that "the level of contribution is determined in the manner described in the plan or proposed plan", appears to breach RMA s 108(10):<br><br>"(10) A consent authority must not include a condition in a resource consent requiring a financial contribution unless—<br>(a) the condition is imposed in accordance with the purposes specified in the plan or proposed plan (including the purpose of ensuring positive effects on the environment to offset any adverse effect); and<br>(b) the level of contribution is determined in the manner described in the plan or proposed plan."<br><br>An applicant's response to this issue is typically that the compensation is instead a "measure proposed or agreed to by the applicant" under s 104(1)(ab), i.e. an *Augier* condition proffered by the applicant, which can either be accepted or rejected by the consent authority (but not imposed or altered without the applicant's agreement).<br><br>Forest & Bird considers that this approach is seriously problematic in circumstances where |

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| | | | compensation is being relied upon to address more than minor residual adverse effects. Here, it is unclear how the proffered quantum of compensation has been calculated, and there appears to be no link between the relevant effects and the amount of compensation. |