

23 January 2026

Environmental Protection Authority  
Te Mana Rauhi Taiao  
Private Bag 63002  
Wellington 6140

**Re: FTAA-2508-1097\_Letter\_RFI\_under\_s\_67\_19 Dec 2025**

This document provides Lodestone Energy Limited’s (Lodestone) response to the Request for Further Information (RFI) dated 19 December 2025 issued by the Haldon Solar Expert Panel. The response addresses ecological matters raised under items 1-4 of the RFI, and provides clarification, additional assessment, and proposed refinements to effects management, monitoring, and compensation measures. Supplementary information on invertebrate and lizard surveys is included.

**Response to Question 1**

**Adequacy of Surveys**

A desktop study was not completed as on site field verification and the ecologists vast experience with Mackenzie Basin ecology was considered the primary determinant of indigenous vegetation presence.

However, for completeness we have added Table 1 below of expected nationally threatened flora and we confirm these taxa were specifically targeted during the 2024 field programme.

*Table 1: Desktop Screening of Nationally Threatened Flora*

Nationally Critical	Nationally Endangered	Nationally Vulnerable
<i>Carmichaelia curta</i>	<i>Cardamine (a) (CHR 312947; "tarn")</i>	<i>Carex cirrhosa</i>
<i>Ceratocephala pungens</i>	<i>Centipeda minima subsp. minima</i>	<i>Carex rubicunda</i>
<i>Chaerophyllum colensoi var. delicatulum</i>	<i>Crassula multicaulis</i>	<i>Carmichaelia kirkii</i>
<i>Chenopodium detestans</i>	<i>Wurmbea novae-zelandiae</i>	<i>Hypericum rubicundulum</i>
<i>Crassula peduncularis</i>	<i>Lagenifera montana</i>	<i>Isolepis basilaris</i>
<i>Leptinella conjuncta</i>	<i>Leonohebe cupressoides</i>	<i>Sonchus novae-zelandiae f. novae-zelandiae</i>
<i>Pseudognaphalium ephemerum</i>	<i>Lepidium sisymbrioides</i>	<i>Lachnagrostis tenuis</i>
<i>Triglochin palustris</i>	<i>Lepidium solandri</i>	<i>Myosotis brevis</i>
	<i>Myosurus minimus subsp. novae-zelandiae</i>	<i>Olearia fimbriata</i>
	<i>Ranunculus brevis</i>	<i>Rytidosperma merum</i>
		<i>Senecio dunedinensis</i>

Targeted searches were timed to maximise detectability (October 2024 for cryptic spring annuals; additional surveys in November–December 2024 and again in December 2025).

### **Survey methods and findings**

Advice from Manaaki Whenua-Landcare Research is that adequate survey of this type of dryland site requires at least 28 person-hours per 100 hectares<sup>1</sup>. The solar array site is approximately 320 hectares. A full survey, adequate to provide robust data to inform an assessment of effects, would require approximately 90 hours searching by ecologists with experience in the identification of dryland species. The AgScience survey required approximately 144 hours of field work assuming 8 hour days, although field days were potentially longer in duration.

A spatially mapped high resolution drone image covering the whole site was undertaken and used for desktop assessment, field survey planning and is available for post development ecological monitoring. Coupled with extensive field inspection by extensive walkover assessment, this showed a very uniform community pattern on the outwash surface. The drone imagery provides a GPS explicit location for vegetation and a baseline to monitor future vegetation trends across the full site.

The survey was designed to be scientifically robust and proportionate to site conditions providing a high level of confidence that vegetation composition, structure, and ecological values at the project site have been accurately characterised.

Survey methods followed standard New Zealand vegetation assessment practice (e.g. Wiser & Rose; Hurst et al. 2022), with all species within and adjacent to each plot systematically searched for by two observers. This approach provides a more robust and objective assessment of vegetation cover than rapid visual estimates commonly used in reconnaissance surveys.

Plot locations were determined using random number generation and established in the field using tape measures, eliminating any potential subjective bias in plot placement. Plot size selection was informed by established species–area relationships for fescue tussock grassland on comparable outwash surfaces (Espie 1987)<sup>2</sup>.

The on-site survey effort comprised systematic walkover surveys including targeted seasonal timing across the Solar Site and adjacent areas, supplemented by intensive searching by two observers within:

- Thirty six marked 100 m<sup>2</sup> plots (twenty four on site and twelve adjacent),
- fourteen 35 m<sup>2</sup> belt transects (in or adjacent to enclosure plots), and
- eight 1 m<sup>2</sup> quadrats within each plot or transect.

Within the Solar Site, twenty four plots were established, representing a total sampled area of 2,400 m<sup>2</sup>. Including immediately adjacent dryland plots, the total sampled area was 4,090 m<sup>2</sup> (including transects).

The primary method for detecting cryptic plants was 1 m<sup>2</sup> quadrats. However, small species were also specifically searched for across the 100 m<sup>2</sup> plots, belt transects, and walkover surveys, including targeted seasonal timing.

Plot size selection was determined by established species–area relationships for fescue tussock grassland on a comparable fluvio-glacial outwash surface (Espie PhD Thesis 1987), refer Figure 1.

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<sup>1</sup> Source is 'Haldon Station Solar Array Site Vegetation' report from M Harding at DOC dated December 2025

<sup>2</sup> Espie, 1987: Edaphic Ecology of *Festuca Novae-Zelandiae*, *Lotus Pedunculatus* and *Trifolium Repens* on Craigieburn High Country Yellow-Brown Earth & Related Soils

These data demonstrate that 100 m<sup>2</sup> plots are sufficient to capture almost all species present in short tussock grassland communities. The Haldon Solar Site supports a lower-diversity, semi-arid variant of this community, with approximately ten indigenous vascular species recorded across the site, further confirming that the chosen plot size is conservative and appropriate.

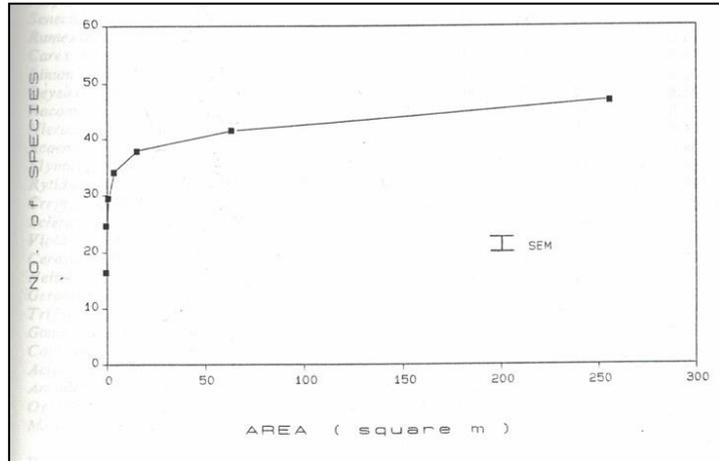


Figure 1. Species area relationship for fescue tussock grassland on similar fluvioglacial outwash. SEM = Standard Error of the Mean (Espie, 1987).

This combined approach of targeted quantitative sampling supported by comprehensive walkover assessment is consistent with accepted ecological practice for large, predominantly modified sites, where replication across representative habitats is more informative than uniform grid-based sampling across the entire area.

Accordingly, the vegetation survey effort is considered appropriate and proportionate to the scale, landform, and ecological values of the site, and provides a robust basis for characterising vegetation patterns and assessing ecological effects.

The total survey and analysis time is in the order of two months comprising nine (9) working days of field survey and twenty (20) working days of analysis of approximately 400 plot images.

A DOC botany visit by three ecologists on 20 November 2025 aiming at recording any instances of threatened plants using the reconnaissance methodology recorded three occurrences of *Lepidium solandri*; SLR recorded one further instance in December 2025 (likely corresponding to the same area). These occurrences are mapped and will be avoided/managed.

The following GPS maps show the extensive coverage of site over 150 person hours of ecologists on site including less formal and incidental survey.

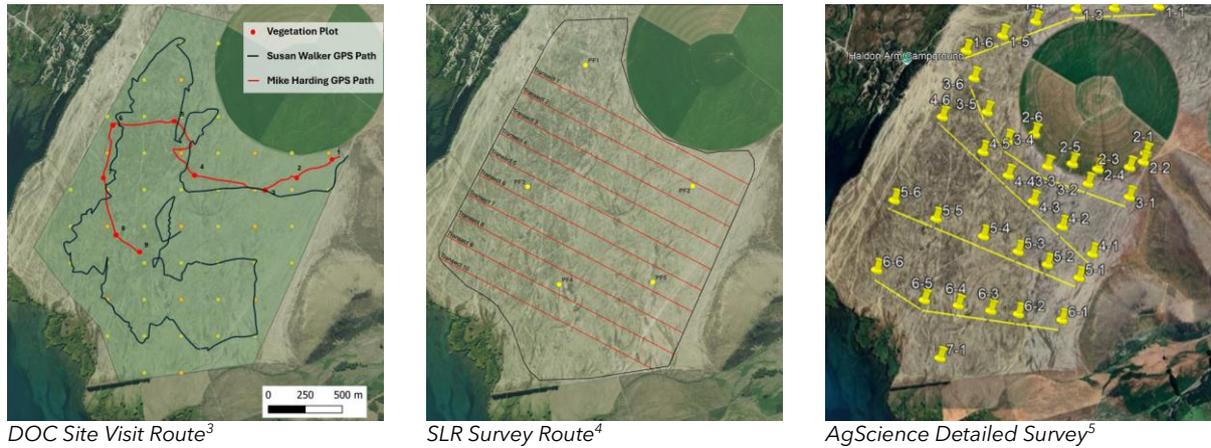


Figure 2: Comparison of Surveys Undertaken by Various Parties

Informed by the results of these subsequent surveys, Lodestone proposes a pre-construction threatened plant survey, with protection of any identified individuals (e.g., marking/caging) and avoidance. Seed could be collected from *Lepidium solandri* to assess propagation and potential establishment within suitable microsites (possible sites highlighted in green below including the transmission corridor).



Figure 3: Possible Sites for Seed Propagation

## Response to Question 2

### Evaluation of Effects on Indigenous Biodiversity

The Panel has sought clarification on the applicant's conclusion that the level of ecological effect is very low. This conclusion is based on the condition of the site, the nature and density of indigenous biodiversity present, the ecological drivers operating at the site, and the scale at which effects are relevant under accepted assessment frameworks.

<sup>3</sup> Source is 'Haldon Station Solar Array Site Vegetation' report from M Harding at DOC dated December 2025

<sup>4</sup> Source is the Terrestrial Invertebrate Assessment from SLR dated 20 January 2026

<sup>5</sup> Source is the AgScience Ecological Assessment dated 31 July 2025

### **Existing Indigenous Biodiversity Values - Botany**

The project site supports a highly modified, exotic-dominated vegetation community that is on a long-term decline trajectory. Indigenous vascular plant species now comprise approximately 0.1% total ground cover (as per the 24 survey plots). With the exception of four At Risk - Declining vascular plant species (one grass and three *Raoulia* scabweeds), all indigenous vascular species recorded on site in 2024 surveys are non-threatened. One Threatened - Nationally Critical herb species *Lepidium solandri* was detected in subsequent surveys, occurring at extremely low density and in a highly localised distribution.

Approximately 20% indigenous ground cover recorded on the site comprises bryophytes and lichens. This consists primarily of a common, non-threatened moss (approximately 12.6%, including a substantial dead component) and a lichen assemblage (approximately 8.3%). This cover reflects increased bare ground and competitive exclusion of vascular species associated with site degradation, rather than a high-quality or representative indigenous vegetation community. These assemblages are absent from less degraded, moister dryland sites nearby.

The At Risk - Declining status of the recorded lichen species is primarily driven by assumed habitat loss at a national scale. This conservation classification is acknowledged. However, at the scale relevant to effects assessment under the EclAG framework, based on long-term observations across the Mackenzie Basin, this species remains widespread locally and is well represented immediately adjacent to the project site and on comparable outwash surfaces.

### **Effects of Solar Development and Rabbit Control**

The Panel has raised concern that reduced rabbit herbivory associated with the proposed perimeter fencing may adversely affect scabweed species. Long-term ecological studies demonstrate that scabweeds are disturbance-dependent species that increase under high rabbit pressure due to reduced competition, and subsequently decline when rabbit numbers are reduced and competitive exotic species increase (e.g. Moore 1976; O'Connor 1998; Espie 2001).

While reduced rabbit herbivory may reduce the abundance of scabweeds in some areas, this response reflects well-documented dryland successional dynamics following reduced herbivory and does not represent a project-specific, irreversible, or population-limiting effect at the scale of individual scabweed populations. Minor ground disturbance associated with solar installation may also create additional colonisation niches for scabweeds, partially offsetting competitive effects.

Importantly, rabbit control is likely to benefit other indigenous species negatively affected by browsing, including the one Threatened - Nationally Critical *Lepidium solandri* recorded on site. Reduced browsing pressure is expected to improve survival and recruitment potential for this species, subject to appropriate construction avoidance and management controls.

Vegetation management options, such as occasional light grazing and targeted woody weed control, are readily implementable and consistent with existing land management practices under which threatened species have persisted both on site and in the surrounding landscape.

The operational footprint of the solar arrays will result in approximately 40% horizontal ground cover, with large areas remaining undeveloped including a 16 ha conservation area beneath the transmission lines and around 25 ha north of the development footprint.

The Ecological Impact Assessment Guidelines (EIANZ, 2018) were applied in determining overall effects. Under the EclAG framework, At Risk - Declining species are assigned high ecological value. However, ecological value does not equate directly to effect significance, which must be assessed in conjunction with effect magnitude, spatial extent, duration, reversibility, and ecological context.

On this basis, the magnitude of effects is summarised as low or very low for the reasons outlined below:

- Threatened species occur at very low to extremely low densities and are highly localised;
- The site is in a highly modified and degraded state;
- The site represents around 0.5% of the dryland environment in the Mackenzie Basin;
- The vegetation community itself is not of ecological significance at the ecological district scale;
- Populations of all threatened species are well represented in extensive adjacent and protected areas; and
- The Project is not expected to result in the loss of viable populations or a meaningful reduction in distribution, given the ability to manage site conditions to maintain existing indigenous components.

Further discussion of the ecological values and magnitude of effects is presented within Table 2.

Table 2: EclAG Tables A-C Summary - Indigenous Biodiversity Effects

Receptor	Ecological Value (Table A)	Key Effect Pathways	Residual Magnitude of Effect (Table B)	Level of Effect (Table C)	Rationale
Threatened - Nationally Critical herbs	Very High	Construction disturbance; potential shading; altered grazing pressure from rabbit control	Negligible	Low	Known, extremely rare, occurrences are spatially mapped and will be avoided or physically protected during works. Pre-construction targeted surveys will confirm distribution and inform micro-siting. Reduced rabbit browsing is expected to be neutral or beneficial for survival and recruitment. No measurable loss of individuals, habitat viability, or population sustainability is anticipated.
At Risk - Declining vascular plants (incl. Raoulia spp.)	High	Reduced rabbit herbivory increasing competition from exotic species; minor construction disturbance	Low	Low	Effects are localised and reversible. Minor ground disturbance may create colonisation niches. Ongoing vegetation management (e.g. light grazing and targeted weed control) can maintain suitable open habitat structure. No loss of viable populations is anticipated at site or landscape scale.
At Risk - Declining lichen	High	Potential increase in competition from exotic ground cover	Low	Low	Lichen assemblage reflects degraded open-ground conditions rather than an intact ecosystem type. Although nationally At Risk, the species remains widespread locally and well represented in adjacent habitats. Vegetation management will maintain suitable microsites.
Moss and lichen ground-layer assemblage (overall)	Low	Changes in ground cover competition	Low	Very Low / Negligible	Assemblage is primarily a function of site degradation and increased bare ground rather than ecological integrity. It does not constitute a priority ecosystem or habitat type.
Vegetation community (modified dryland grassland)	Low	Solar array footprint; fencing; ongoing operation	Low	Very Low / Negligible	Community is highly modified and exotic-dominated. Large areas of the site remain undeveloped, including designated management areas. No rare or threatened habitat types will be lost.
Indigenous lizards (overall)	Low	Localised construction disturbance to potential habitat; vehicle movements	Negligible	Very Low / Negligible	Suitable lizard habitat is extremely limited (<0.3% of the site), highly fragmented, and degraded. No lizards have been observed to date, with only indirect sign recorded. Any lizards present are likely to comprise small numbers of common, non-threatened species (e.g. McCann's skink). No regionally or locally significant lizard populations or Threatened or At Risk lizard species are expected to occur. Effects would be highly localised and readily avoided or managed if lizards are confirmed.
Threatened and At Risk grasshoppers (including robust, minute, and Otago short-horned grasshoppers)	High	Direct mortality during construction; habitat alteration and shading during operation	Low	Low	Threatened and At Risk grasshopper species are present at low to moderate densities within open, gravelly habitats that are widespread across the site and the wider landscape. Construction effects would be spatially limited, and large areas of habitat would remain unaffected. Design measures, construction management, and adaptive monitoring reduce the likelihood of population-level effects at a site or landscape scale.

Threatened - Nationally Endangered Tekapo ground wētā	Very High	Direct mortality during earthworks; alteration of shallow-soil habitats	Low	Low	Tekapo ground wētā were recorded at low densities and are associated with shallow soils occurring as part of a broader habitat mosaic. While ecological value is very high, the extent of potential impact is limited by the small footprint of earthworks relative to the site. Avoidance, minimisation, and potential remedial measures can reduce residual effects such that no loss of population viability is anticipated.
Terrestrial invertebrate assemblage (overall)	Moderate	Construction disturbance; shading and microclimate changes during operation	Low	Low	The invertebrate assemblage recorded is typical of degraded dryland outwash plains and dominated by widespread species. Although Threatened and At Risk taxa are present, habitats are not rare or intact and occur extensively beyond the site. Effects are expected to be localised and manageable through design, vegetation management, and adaptive monitoring.
Indigenous fauna (lizards and invertebrates - integrated assessment)	–	All pathways combined	Low	Low	When considered cumulatively, effects on indigenous fauna are not expected to result in the loss of viable populations or a meaningful reduction in distribution. Strong landscape context, limited habitat availability within the site, and the application of avoidance, minimisation, and adaptive management reduce residual effects below ECIAG significance thresholds. Conclusions will be confirmed following completion of final survey rounds.

### Response to Question 3: Avifauna

While the likelihood of avian mortality associated with the construction and operation of the Haldon Solar Farm is assessed as low, Lodestone recognises that any mortality involving nationally Threatened or At-Risk species—such as black stilt (kakī), wrybill, or black-fronted tern—could have disproportionately high conservation consequences. Accordingly, Lodestone has adopted a precautionary approach that combines avoidance through site selection and design, robust monitoring capable of detecting rare events, and clearly defined adaptive management responses. This framework ensures that, should low-probability but high-consequence effects occur, they can be promptly identified and addressed through targeted mitigation and, where necessary, offsite compensation to achieve no net loss of these species.

The Haldon Solar Farm has been designed to minimise the risk of avian mortality through the following measures:

- A minimum 200 m buffer is maintained between the fenced site and Lake Benmore and other water bodies.
- Panel orientation and spacing reduce any potential “lake effect” and allow birds to safely navigate through the site via access corridors (minimum 3.4 m between panel rows when panels are flat).
- Panels cover a maximum of 40% of the ground when they are flat at solar noon; ground coverage is reduced when panels are tilted at all other times.
- Birds are not at risk of electrocution, as all solar farm wiring will be fully insulated.
- No new transmission lines are proposed; only a substation is required to connect to existing transmission infrastructure. There will be one new transmission tower and short span of conductor (~20m) to connect the new substation to the existing line.
- The site is located away from important bird areas and is not in close proximity to the DOC kakī aviaries. The figure below shows tracking data for black-fronted terns in the surrounding area.

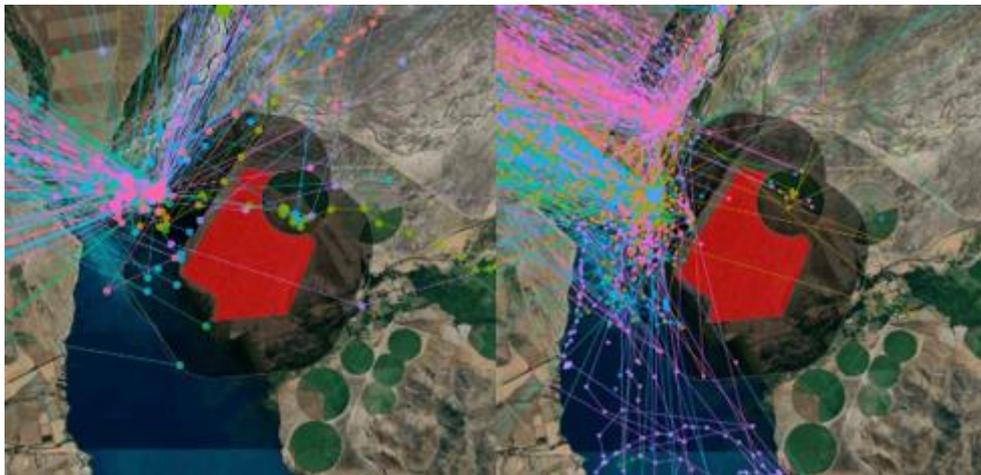


Figure 4: Bird flight paths and location fixes as identified by DOC surveys<sup>6</sup>

<sup>6</sup> Left hand picture: Tracks of 35 black-fronted terns (Nationally Endangered) (1,104 fixes 6/11/20 - 21/1/22). Each colour denotes a different bird. The dots are precise location fixes and the lines interpolated flightpaths between consecutive fixes  
 Right hand picture: Tracks of 16 black-fronted terns (Nationally Endangered) (55 fixes 22/10/22 - 29/1/24). Each colour denotes a different bird. The dots are precise location fixes and the lines interpolated flightpaths between consecutive fixes  
 (Data source: DOC).

## Management of Construction Risk to Avifauna

A pre-construction survey is proposed to confirm the absence of nesting birds within the site. Surveys undertaken to date, together with information provided by the landowners, indicate that the site is not used for nesting or regular occupation by birds. Should any nesting birds be identified, appropriate exclusion zones would be established and maintained until chicks have fledged. These measures are considered capable of being effectively managed through consent conditions.

## Collision Risk

International literature in relation to the avian “lake effect” hypothesis indicates that collision risk at solar farms is generally low, but not zero<sup>78</sup>. The literature also suggests there are very site-specific considerations and point to water scarcity as being a potentially critical factor. However, the applicability of this literature to the New Zealand context is limited.

The recent NZ consent decision for Glorit Solar Farm elaborates on some of the evidential matters with regard to collision risk<sup>9</sup>. The decision confirms that the existing literature is largely based on installations in the southwestern United States. The following additional comments are noted:

- The risk of collision is exacerbated by the lack of presence of nearby water bodies. The immediately adjacent Lake Benmore (Te Ao Marama) at Haldon represents a large mitigating factor likely to substantially reduce the collision risk.
- Higher fatality rates are biased toward large > 1000 ha installations.
- There is limited evidence to suggest that collision risk is a significant issue at solar farms outside of arid, desert sites in the US.
- Most waterbird collisions in the literature apply to sites where migratory waterbirds may be drawn to solar farms in search of open water bodies.
- Many of the US studies are conducted on solar farms that use different or older technology. For example, Concentrated Solar Power (CSP), or fixed tilt systems, or panels without anti-reflective coating. As the Haldon site will utilise modern photovoltaic panels with anti-reflective coating, and is a single axis tracking system, these collision studies are not applicable.
- Even in the desert contexts with higher fatality rates, the high-end estimates are still significantly lower than that associated with other anthropogenic structures such as communication towers, wind turbines and road mortality (in particular, vehicle collisions).
- There are numerous records of birds regularly interacting with solar panels and solar farms without harm. Lodestone also has anecdotal video evidence of harmless water fowl interaction at one of our sites during a flood.
- The US studies themselves specifically stated that they should not be used to extrapolate fatality rates for sites with markedly different habitats.
- Follow-up research in the US is in progress by Argonne National Laboratory. The research utilises cameras and AI technology coupled with ground-based fatality monitoring and includes 100,000 camera tracks and 70,000 hours of video. Preliminary analysis has reported no diurnal avian collisions.

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<sup>7</sup> [Aquatic Habitat Bird Occurrences at Photovoltaic Solar Energy Development in Southern California, USA](#) Aquatic Habitat Bird Occurrences at Photovoltaic Solar Energy Development in Southern California, USA

<sup>8</sup> <https://www.energy.ca.gov/sites/default/files/2024-06/CEC-500-2024-055.pdf> Investigating the “Lake Effect” Influence on Avian Behavior From California’s Utility-Scale Photovoltaic Solar Facilities

<sup>9</sup> <https://www.epa.govt.nz/assets/Uploads/Documents/Fast-track-consenting/NBEA-process/NBEA-Glorit-Solar-Farm/Glorit-Solar-Farm-decision-with-amended-conditions-of-consent-4-November-2025.pdf>

Lodestone has four operational solar farms in New Zealand and therefore has direct experience within the local context. To date, there have been no known bird fatalities associated with the operation of Lodestone's solar farms.

Notwithstanding this operational experience, Lodestone acknowledges the importance of providing confidence that the operation of the Haldon Station Solar Farm will not adversely affect nationally Threatened or At-Risk species, including black stilt (kaki), wrybill, and black-fronted tern.

To support this, Lodestone has engaged biostatisticians from Proteus to develop a robust, standardised bird mortality monitoring programme, due for delivery in early February 2026. Key elements of the monitoring programme will include:

- statistically robust carcass search methodologies;
- explicit consideration of detectability, scavenging rates, and survey effort;
- evaluation of monitoring performance under realistic mortality scenarios; and
- adaptive refinement of methods based on early monitoring results.

This protocol will provide a transparent and scientifically defensible framework for detecting bird mortalities should they occur, including the ability to test hypotheses such as potential lake-effect interactions.

Monitoring results will be reviewed at defined intervals and will trigger pre-specified adaptive management responses, including the implementation of additional mitigation or compensation measures where required.

Any mitigation or compensation measures would be recommended by a suitably qualified avifauna expert, be species-specific, and be designed to ensure no net loss of Threatened or At-Risk species.

### **Potential Response Measures**

Possible mitigation/offsetting measures in response to construction activities includes:

- a pre-construction survey to confirm the absence of nesting birds within the site; and
- establishment of exclusion zones in the event nesting birds are identified.

Possible mitigation measures to reduce contact with solar panels include:

- use of visual deterrents or warning markings;
- use of acoustic deterrents; and/or
- use of chemical deterrents.

Possible compensation measures include:

- funding of conservation initiatives, such as the DOC Kaki Recovery Programme;
- contribution to restoration or enhancement of existing or potential habitats; and/or
- contribution to predator control in existing or potential habitats.

The Proteus protocol will finalise technical parameters (e.g., search interval and detection trial design), but monitoring will commence at commissioning and will include detection trials, independent review, and pre-defined triggers for mitigation and compensation, as outlined above.

## **Response to Panel Question 4 - Monitoring, Adaptive Management and Offset/Compensation**

The Panel has sought further assurance that proposed monitoring and adaptive management measures will adequately address ecological effects and deliver tangible biodiversity outcomes, including whether compensation actions are warranted and, if so, how they would target the most threatened biodiversity values in the area.

The applicant proposes an adaptive management and monitoring framework to manage potential effects on indigenous vegetation and invertebrate fauna, with particular focus on Threatened and At Risk dryland species present or likely to be present within the site.

Avoidance and site layout: areas not required for solar infrastructure will be retained as Ecological Management Zones (EMZ). Potential areas are highlighted in green in Figure 5 below.



Figure 5: Possible Ecological Management Zones

1. These areas will avoid construction disturbance where feasible and retain the existing variety of dryland habitat characteristics (e.g. bare ground, gravels, lichens and low-stature vegetation), providing refugia for indigenous invertebrates and vegetation and reference areas for monitoring.
2. Pre-construction surveys: targeted pre-construction surveys will be undertaken within areas proposed for disturbance to:
  - a. Confirm presence and distribution of key indigenous invertebrates (including *Sigaus minutus*, other grasshoppers and wētā); and
  - b. Identify localised occurrences of Threatened or At Risk indigenous plants (including *Lepidium solandri*).
3. Survey results will inform minor layout refinement where practicable to avoid the highest-value patches. Other solutions such as placing cages over *Lepidium solandri* could be considered.
4. Construction will be confined to defined footprints, with retention of existing ground surfaces and microtopography wherever practicable. Unnecessary soil importation, re-

contouring and surface stabilisation will be avoided where possible to maintain dryland habitat conditions.

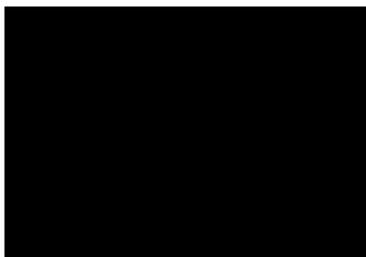
An invertebrate enclosure will be established within an EMZ to protect representative dryland habitat, provide a refuge for indigenous invertebrates, and act as a long-term monitoring reference area.

5. A *Lepidium solandri* propagation nursery could be established to collect seed from on-site populations and propagate plants for re-establishment in non-shaded areas of the site, particularly within EMZs and other suitable locations.
6. Post-construction monitoring will assess indicator invertebrate populations and the condition and persistence of Threatened and At Risk indigenous vegetation, with comparison against EMZ and enclosure reference areas.
7. Clear adaptive management triggers will be defined. If sustained declines or localised losses attributable to the project are detected, management responses may include refinement of ground management practices, targeted enhancement planting using nursery stock, or expansion of EMZs where practicable.

This framework prioritises avoidance, on-site management and adaptive response, provides certainty through defined monitoring and triggers, and represents a proportionate and practical alternative to large-scale compensation or offsetting while maintaining indigenous dryland biodiversity values. This must also be considered in the context of the project's broader environmental benefits, including its contribution to climate change mitigation.

If monitoring identifies sustained, project-attributable declines in Threatened or At Risk species that cannot be addressed through on-site management, Lodestone will implement targeted compensation in consultation.

Yours faithfully



**GM, Development**

## Supplementary Information

### Lizard surveys - preliminary findings

A preliminary lizard assessment has been undertaken for the Haldon Solar Farm site by Blueprint Ecology Limited, comprising a desktop review of regional records, systematic habitat assessment, manual searching and visual encounter surveys, and the deployment of artificial cover objects (ACOs) and pitfall traps in accordance with DOC inventory and monitoring guidance

Survey devices were installed in November 2025 and are scheduled to be checked during suitable weather conditions in late January 2026, following a minimum ten-week deployment period.

The assessment identified that the project site has been subject to extensive historic modification through agricultural activities, resulting in a near-complete loss of habitat suitable for indigenous lizards. The site is characterised by open, hieracium-dominated grassland with a general absence of rocks, debris, long vegetation, or other refugia required for lizard persistence. As a result, suitable lizard habitat is extremely limited and confined to approximately 1 hectare (less than 0.3% of the site), occurring as small, highly fragmented patches of exotic sweet briar shrubland and localised rock piles around transmission pylons.

No lizards have been directly observed to date during field surveys; however, lizard scat has been recorded at two pylon locations, indicating the possible presence of a small number of McCann's skink (*Oligosoma maccanni*), a species that is not threatened and is known to utilise disturbed, rocky habitats. Desktop assessment of DOC Bioweb records indicates that while several At Risk and Threatened lizard species occur within the wider region, suitable habitat for these species is absent from the site. On this basis, it is considered unlikely that the site supports regionally or locally significant lizard populations, or any At Risk or Threatened lizard species.

The conclusions of the lizard assessment are preliminary and will be confirmed following the final checking of survey devices in late January 2026. A final lizard assessment report will be prepared once these results are available. Should lizards be confirmed within areas subject to construction, appropriate avoidance or mitigation measures, including engagement with the Department of Conservation and the potential requirement for a Wildlife Act Authority, will be implemented.

### Terrestrial invertebrate surveys - preliminary findings

A terrestrial invertebrate assessment has been undertaken by SLR Consulting New Zealand Limited to characterise invertebrate values within the Haldon project site, with a particular focus on Threatened and At Risk dryland species known from the Mackenzie Basin

The assessment included a comprehensive desktop review of regional records, targeted field surveys undertaken in December 2025, pitfall trapping, grasshopper transects, sweep netting, and visual encounter surveys. Additional survey work targeting taxa active later in summer is planned for late January 2026, and results will be reported in a subsequent addendum.

The desktop assessment identified a large pool of invertebrate taxa potentially present in the wider area; however, field surveys recorded a relatively modest assemblage consistent with the highly modified and exposed dryland habitats present on site. A total of 92 invertebrate taxa were recorded during the December 2025 survey period, with assemblages dominated by common, widespread species associated with open, disturbed environments.

Notwithstanding this, several Threatened and At Risk invertebrate species were confirmed to be present within the site. These include robust grasshopper (*Brachaspis robustus*; Threatened - Nationally Endangered), minute grasshopper (*Sigauss minutus*; Threatened - Nationally Vulnerable), Otago short-horned grasshopper (*Phaulacridium otagoense*; At Risk - Declining), and Tekapo ground wētā (*Hemiandrus furoviarius*); Threatened - Nationally Endangered). These species were

recorded at low to moderate densities and are associated with open gravelly substrates, sparse vegetation cover, and shallow soils, which occur as a mosaic across the site.

The invertebrate habitats present within the site are typical of degraded dryland outwash plains in the Mackenzie Basin and do not constitute rare or intact ecosystem types. However, the presence of Threatened and At Risk invertebrate species indicates that some areas of the site retain ecological functionality for dryland invertebrates. The survey also recorded the presence of introduced mammalian predators, including hedgehogs, which are known predators of grasshoppers and wētā.

The findings of the invertebrate assessment are preliminary, and further surveys planned for late January 2026 will provide additional information on seasonal activity patterns and the presence of taxa not detectable during early summer. These results will be incorporated into an addendum to the invertebrate assessment and used to refine the evaluation of effects, mitigation measures, and any requirements for adaptive management or compensation.