

Review of the 'Draft Terrestrial Invertebrate Management Plan for the Point Solar Farm at Twizel, Canterbury.' A Wildlands Contract Report No. 6621h-ii

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Introduction

As part of the Far North Solar Farm application in the Mackenzie Basin, indigenous invertebrates have been included in the environmental assessments. Wildlands, an ecological consultancy, were engaged to assess the invertebrate species present and to provide options for enhancing species survival and effectively compensating for potential habitat impacts from the 600 hectare solar installation (Wildlands 2026).

The Wildlands Threatened Invertebrate Management Plan (TIMP).

The 31-page report is generally a sound document that presents the key values and management methods for native invertebrates at the proposed solar farm site. The report also summarises results from two invertebrate surveys carried out in 2023 and 2026. Both surveys determined that the primary area proposed for development has been substantially modified by tilling and has few, if any indigenous invertebrates present. I have visited the site and generally agree with this impression.

The two invertebrate surveys conducted by Wildlands each produced a small number of invertebrate species of conservation interest, primarily grasshoppers (the Otago Short horned grasshopper *Phaulacridium otagoense* and the minute grasshopper *Sigauss minutus*), as well as a small native butterfly the New Zealand Blue (*Zizina* sp.).

The report highlights several species that are likely to exist on, or at least survive on, habitats peripheral to the proposed solar farm. These include the Tākapo ground wētā (*Hemiandrus fabella*), the robust grasshopper (*Sigauss robustus*), several beetles and spiders. I agree with this assemblage as being typical of this arc of Mackenzie Basin habitat.

The report is careful to note that *S. robustus* has not (yet) been found on the area proposed for the solar farm, nor has it been found on suitable habitat adjacent to the development area. Nevertheless, a protocol is provided for the identification and action should the hopper and ground wētā be discovered during construction. The protocol is practical and useful.

Table 1 (page 7), provides a useful list of seven invertebrates that have either been confirmed (only two) or are likely to exist on surfaces proposed for solar panel installation. The list of taxa probably has more use for the section 4.6.4, the establishment of an invertebrate reserve.

Meanwhile, the potential effects of the solar installation on invertebrates were discussed including; habitat removal, mortality and disturbance, habitat modification, creation of concrete and gravel areas and the significance of those effects. Below, I review each of these categories.

Effects of habitat removal.

For most construction works that involve habitat disturbance or removal, impacts on terrestrial invertebrates will be most severe for flightless and large bodied species. Although remote, it is possible that the Tākapo ground wētā could be affected – *if present*. Identification of this insect is appropriately provided in Appendix 2.

The Wildlands report also focusses on the relative scale of areas disturbed-to-not-disturbed, stating; “the amount of high-quality habitat to be removed is relatively small”. By that I assume the report is referring to the undisturbed periphery of the proposed solar area. It might have been worthwhile during the entomology surveys to have dug several test holes in the ground to check for ground dwelling invertebrates, particularly for subterranean life-stages of terrestrial invertebrates. That investigation could still be carried out.

Habitat modification.

The report appropriately identified the greatest impact for ground invertebrates adapted to open, sunny surfaces of the Mackenzie Basin: Shading by the solar arrays. But the matter is not followed up elsewhere in the report. Instead, plans for translocations, native plantings and an invertebrate reserve are presented in considerable detail. The invertebrate reserve proposal is laudable and although experimental, may turn out to be a success story. The effect of shading an area over 600 hectares that is currently an open surface, is also experimental. In my opinion, more information is required about shading as a form of habitat modification.

Concrete and gravel areas.

The report states “Concrete provides a warm, flat surface for basking, which may benefit New Zealand blue butterflies and grasshoppers. Where areas of concrete are created and interspersed with short-stature indigenous herb field plants, this may create new habitat and result in a net positive effect” (p. 10). Maybe, but no references are offered to back up this optimistic view and I remain sceptical that the species of invertebrates identified in the Wildlands surveys would benefit from slabs of concrete. On the other hand, gravel roads in the Mackenzie Basin have definitely provided suitable habitat for the grasshopper *Sigaus robustus*.

The typical example is the Patersons Terrace grasshopper reserve, which supports a sizeable population of the hoppers. However, it is the *lack of disturbance* that affords the hoppers suitable habitat. The cobbles of this road show decadal-length lichen growth, while mat forming plants occupy sizeable areas for grasshopper feeding and oviposition. Unless the proposed gravel access roads and gravelled areas have a similar disturbance regime (i.e. minimal), to Patersons Terrace, I’m of the view there will be minimal hopper occupancy at the solar farm.

Management of effects.

Several options are proposed in the report to avoid or minimise potential adverse effects on the indigenous invertebrates of conservation interest. The primary method is a Threatened Invertebrate Management Plan (TIMP). The plan appropriately discusses avoidance of sensitive areas, dust / vibration reduction and most significantly a pest-free invertebrate reserve of some 13.8 hectares.

The reserve will pose some challenges but has the potential to be a valuable refugia for several Mackenzie Basin species of interest (hoppers, wētā, beetles, moths and butterflies etc). Considerable restoration planting will be included in the reserve.

Within tables 3, 4 and 5, forty-nine plant species are suggested for inclusion within the invertebrate reserve. Many of the plants are important host species for invertebrates and I agree with the Wildlands selection. However, my concern is apportioning of the number of plant species and individual plants per hectare and the distribution of plants from one end of the reserve to the other. At 13.8 hectares and 49 plants there'd be an average of 3.5 species per hectare but that figure doesn't accommodate the number of individuals and location of each plant species in the reserve. This matter will require considerable planning, particularly as the woody species will increase in size. I would suggest taking small, adaptive management steps. Besides, the proposal is essentially a gardening exercise.

Compensation: Research funding.

In Section 4.6.14 (page 23) the Wildland report outlines a range of student research stipends that could focus on the efficacy of invertebrate translocations. While noble, I consider the listed research topics secondary to the primary issue with large-scale solar arrays: Shading effect of panels. In my view, this is the single most important matter to tackle for all applications for solar farms in areas of semi modified lands (with strong natural history signals). This should include plants and invertebrates that are likely to be negatively affected by hectares of shaded substrate where previously they persisted on open, sunny surfaces.

Controlled trials and experiments that investigate the effect of wide-area shading on indigenous elements should be a priority. I think the Wildlands report could also highlight that topic.

Appendices.

Appendix 1. Covers salvage and translocation protocols which are thorough and sound.

Appendix 2. Discusses incidental discoveries of grasshoppers and wētā.

The protocol outlines how to handle Otago short horned grasshoppers in containment and I agree with the process. I would add that transferring hoppers into small pots or containers is best carried inside a high-sided tub or plastic bin which will contain any hoppers that may escape handling. It may also be worth placing wrapped, pre-frozen freezer pads in the bin to keep the ambient temperature low. Grasshoppers are much easier to handle when chilled.

Other minor matters.

Page 26. Two grammatical errors, final two paragraphs on the page. The number of grasshoppers observed is not stated:

“Transects will be walked for a minimum of seven consecutive days. If numbers of Otago short-horned grasshopper caught over the course of seven days decline, with fewer than [?] Otago short-horned grasshopper captured on day seven, trapping will cease.

If the same or high numbers of Otago short-horned grasshopper are still found at day seven (fewer than [?] individuals per day), transects may continue for another three days depending on numbers caught and the weather, at the discretion of the Project Entomologist.

Reference.

Wildlands 2026. Draft Terrestrial Invertebrate Management Plan for the Point Solar Farm at Twizel, Canterbury. Unpublished client report No. 6621h-ii. Pp 31.