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Our Ref: 6986b

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Nova Energy
[redacted]

Dear [redacted]

TEKAPO GROUND WĒTĀ TRACKING TUNNEL SURVEY

Nova Energy Ltd proposes to develop a solar energy farm east of Twizel township in the Mackenzie Basin (Figure 1). Wildlands Consultants Ltd (Wildlands) have previously provided an assessment of the site's ecology and an Assessment of Ecological Effects (AEE) for the project, based on a development area provided by Nova Energy. The AEE[1] results recommended further field surveys, which were undertaken in summer 2024[2].

Field surveys in 2023 and 2024 detected significant invertebrate values on the site, particularly grasshopper species and Tekapo ground wētā (TGW; *Hemiandrus* "furoviarius", Threatened – Nationally Endangered; Trewick *et al*. 2022[3]). Two TGW were trapped using live-capture pitfall traps during the 2024 summer field surveys, but the ground was too hard over most of the site to allow for a comprehensive survey using pitfall traps.

Currently, no standard protocol for surveying or monitoring TGW exists. Based on previous studies where tracking tunnels have been used to detect and monitor wētā (primarily giant wētā; e.g. Watts *et al*. 2011[4]), a methodology was designed to use tracking tunnels to survey for TGW throughout the site. This memorandum presents the methods and results of the TGW tracking tunnel survey.

METHODS

Time of year and weather conditions

The tracking tunnel survey was carried out in April 2024 during fine, sunny weather with cold, clear nights.

[1] Wildland Consultants (2023). *Assessment of potential ecological effects of the proposed Nova Energy solar farm near Twizel*. Wildland Consultants Contract report no. 6620. Prepared for Nova Energy. 58pp.
[2] Wildland Consultants (2024). *Additional lizard, vegetation, and invertebrate surveys of a proposed Twizel solar farm*. Wildland Consultants Contract Report No. 6986. Prepared for Nova Energy. 36pp.
[3] Trewick S., Hegg D., Morgan-Richards M., Murray T., Watts C., Johns P., and Michel P. (2022). Conservation status of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand, 2022. *New Zealand Threat Classification Series 3*9. Department of Conservation, Wellington.
[4] Watts C., Stringer I., Thornburrow D., and MacKenzie D. (2011). Are footprint tracking tunnels suitable for monitoring giant weta [sic] (Orthoptera: Anostostomatidae)? Abundance, distribution and movement in relation to tracking rates. *Journal of Insect Conservation*, 15, 433-443.

Tracking tunnel setup

Black Trakka™ tracking tunnels with ready-inked cards were used. Tinned pear was used as bait, as it has been used in live-capture pitfall traps for TGW (T. Murray, pers. comm).

Six transects were run across the whole property (Figure 1). Each transect consisted of ten tracking tunnels spaced 50 metres apart to give good coverage of the site while minimising the potential for double-counting the same individual TGW. Tracking tunnels were left out for two nights.

Results analysis

Prints on tracking cards were analysed to identify which animals had used the tunnels. Prints made by insects were sorted into wētā prints, potential wētā prints, and other insect prints. Since wētā species cannot be reliably discerned from prints alone, and TGW are the most likely ground wētā species of their size to be on the property, all large wētā prints were considered likely to be TGW. Potential wētā prints were similar to wētā prints but smaller. They are likely to indicate insects with similar footprints, juvenile TGW, or other, smaller wētā species.

Prints from mice and hedgehogs were also reported for the interests of pest mammal monitoring and control.

RESULTS

Out of 60 tracking cards, 33 showed signs of animal activity. Results are presented in Figure 1.

Tekapo ground wētā tracks

Four tracking cards showed TGW tracks. Three TGW tracks were from Line 6, and one was from Line 2.

Potential wētā tracks were found in Lines 1, 2, 3 and 6.

Other species of interest

Mouse tracks were found in Lines 1, 2, 3, 5 and 6. Hedgehog tracks were found in Lines 1, 3 and 4. A feral cat was spotted during tracking tunnel checks near Line 1.

SURVEY LIMITATIONS

Ideally, surveys for TGW should take place in warm weather during summer, when TGW are most active. However, they are active year-round. The late season and cold, cloudless nights may have reduced detection rate.

IMPLICATIONS FOR MANAGEMENT

Little is known regarding habitat requirements of TGW, or the effects of disturbance or development on their populations. However, while the grasshopper species found on-site require open areas for basking, TGW are nocturnal and do not require open basking spaces.

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Potential effects

Soil changes due to altered vegetation cover may affect burrowing ability and habitat use. The habitat changes caused by solar panels may have unforeseen or indirect effects on TGW abundance. A conservative approach is recommended to avoid detrimental effects to TGW. A conservative approach means that conceivable effects are assumed to be potentially detrimental, even if they have not been previously known to cause problems for TGW. This is due to the lack of knowledge concerning TGW ecology.

Effects management

A TGW Management Plan should form part of the Invertebrate Management Plan to manage effects on invertebrates. The TGW Management Plan will provide advice for avoiding, minimising, mitigating, offsetting, and compensating for effects on TGW. Avoidance and minimisation will be prioritised. Monitoring recommendations will be included in the TGW Management Plan. Effects management will likely require an adaptive approach, using results from monitoring to adjust management as needed.

CONCLUSIONS

Tracking tunnels successfully detected TGW in two additional areas of the site. Combined with results from live-capture pitfall trapping, TGW appear to be occupying areas towards the eastern and western ends of the site. Their presence in the central-eastern portion of the site is unknown. They are using a variety of habitats, from highly-modified open grassland to a barley field. Their apparent adaptability and habitat requirements indicate that effects of solar panels may be minor. However, caution is recommended due to a lack of knowledge about the ecology of TGW.

Yours sincerely,

[redacted]

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Reviewed and approved for release by

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