

**ADDENDUM TO WILDLANDS REPORT R3470**  
**ON THE PROPOSED TE KUHA MINE**

## **INTRODUCTION**

The proposed Te Kuha coal mine site was visited on 9-10 September by Brian Patrick, Dr Mandy Tocher, and Dr Des Smith. Dr Rachel McClellan also visited the mine site on 9 September, and walked the lower section of the haul road (south of Coal Creek) on 10 September. Dr Kerry Borkin did not visit the mine site.

Visits on both days were very brief; approximately three hours was spent in the mine site on 9 September, and two hours on 10 September, while Rachel McClellan spent two hours walking out along the proposed route of the haul road.

Prior to the visit, the applicant provided further information on avifauna, bat, and reptile surveys undertaken at the site.

This addendum to Wildland Consultants (2014) discusses and summarises changes and additions to the conclusions of that report in light of the field visit and the additional information provided by the applicant.

## **AVIFAUNA**

Wildland Consultants (2014) stated that no extra information on avifauna was required from the applicant, but that the avifauna data should be better presented, should the application proceed further, to more clearly demonstrate the bird species and habitat associations present within the proposed mine footprint. This was because bird counts and bird observations had been undertaken throughout the mine permit area, and no separate summary had been produced for the subset of results of species presence and conspicuousness within the affected area.

Wildland Consultants (2014a) also suggested providing a GIS map showing vegetation types overlaid on high resolution aerial photography for the mining permit area, and separate maps for the mine site and the haul road.

In response, the applicant's experts provided a map of the five-minute bird count stations overlaid on a map of vegetation types for the permit area. The location of the haul road and mine site was not provided on this map, so an assessment of the suitability of the sampling intensity within the mine footprint is still not able to be made. However, the applicant also provided a spreadsheet showing survey effort within the mine site (i.e. hours per each of the eight 500 × 500 m grid squares that cover the mine site), and the absence or presence of bird species within those mine squares. A rapid analysis of these data indicates that twelve indigenous species are present within the mine footprint (excluding the haul road; Table 1). Given that the effort varies significantly between squares (from 0.5-15.5 hours), these data can only be used as indicative of the conspicuousness of these species within the mine site. However, it can be assumed that at least all the species listed below will be affected by the proposed mine.

Table 1: Presence of indigenous bird species in the eight grid cells covering the proposed Te Kuha mine footprint.

Bird Species	Scientific Name	Presence (Number of Grid Cells)
Australasian harrier	<i>Circus approximans</i>	1/8
Western weka	<i>Gallirallus australis australis</i>	7/8
South Island rifleman	<i>Acanthisitta chloris chloris</i>	2/8
Silvereeye	<i>Zosterops lateralis lateralis</i>	8/8
Grey warbler	<i>Gerygone igata</i>	5/8
New Zealand pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>	1/8
South Island fernbird	<i>Bowdleria punctata punctata</i>	5/8
Brown creeper	<i>Mohoua novaeseelandiae</i>	1/8
Fantail	<i>Rhipidura fuliginosa fuliginosa</i>	8/8
South Island tomtit	<i>Petroica macrocephala macrocephala</i>	8/8
South Island robin	<i>Petroica australis australis</i>	8/8
Bellbird	<i>Anthornis melanura melanura</i>	8/8

The applicant's experts also provided two maps of the vegetation types overlaid on to aerial photographs of the mine permit area. One map covered the mine permit area, but only showed the location of the haul road and not the mine site itself; the other map showed the extent of the water conservation reserve, but neither the haul road nor the mine. In addition, the shading of vegetation types did not match between the key and the aerial photograph, and could not be interpreted for several habitat types; Wildland Consultants (2010) mapped the vegetation of the Denniston and Stockton plateaux and numbered vegetation types to avoid this type of potential confusion.

Fourteen bird species were opportunistically observed during the brief site visit; all of which were recorded by Mitchell Partnerships (2013). Birds were much less conspicuous within the proposed mine site than along the lower section of the proposed haul road route, which is to be expected given the habitat types present. South Island fernbird *Bowdleria punctata punctata* were seen at relatively regular intervals along the haul road route in pakihi habitat.

Based on the field visit, and the additional information provided by the applicant, the general avifauna conclusions and discussion given in Wildland Consultants (2014) are unchanged.

## **INVERTEBRATES**

A brief entomological inspection of the proposed Te Kuha mine site showed the site to support a wide range of indigenous invertebrates. The suite of species found indicates that the mine footprint is ecologically significant as it supports sustainable populations of all of the following:

- Species endemic to the northwest South Island, e.g. an unidentified stick insect in the genus *Micrarchus*.
- A number of large-bodied flightless species, e.g. Helm's stag beetle *Geodorcus helmsi*.
- At Risk species, e.g. forest ringlet butterfly *Dodonidia helmsi*, At Risk-Relict.
- Widespread but distinctive Main Divide upland species, e.g. zig-zag moth.

- At least four unnamed species, e.g. the leaf-veined slug and *Rhytida*-like snail described by Mitchell Partnerships 2013, and the large spider and stick insect from this site survey.

Notably, no exotic invertebrate species were found either as adults or larval damage.

The prominence of the group of large-bodied flightless invertebrate species probably indicates the intact character of the site, its remoteness, a relatively low introduced predator population, and an overall high degree of naturalness.

Overall, given the suite of indigenous species present, their relationships and life histories, and the high degree of naturalness of the habitat, this site is significant for indigenous invertebrates in regional and national contexts. A more detailed discussion of the findings of the site visit is provided in Wildland Consultants (2014b).

## **REPTILES**

After visiting the site, including parts of the proposed footprint, we concur with the applicant that threatened West Coast green gecko *Naultinus tuberculatus* is almost certain to occur at the site. Although patchy, large tracts of suitable habitat are present. Given that the presence of West Coast green gecko is acknowledged by the applicant (Mitchell Partnerships 2013), this is not a contentious issue. Should the site be developed, this species will need to be appropriately addressed in proposed mitigation, along with *Mokopirirakau granulatus*, *Oligosoma infrapunctatum*, and any other lizard taxa found at the site.

The proposed mitigation for loss of lizards and lizard habitat (c.89 ha), should the proposal proceed, involves predator control for an unspecified period of time, the details of which will be considered in the development of a “Pest Control and Ecosystem Management Plan” (Mitchell Partnerships 2013). The predator control is envisaged to boost lizard populations, including those unaffected by the mine. These populations will then recolonise the rehabilitated landform over the decades following mine closure. The ability of lizard populations to recolonise the rehabilitated landform will be enhanced by the boosted “ready-to-go” populations.

If the proposed predator control mitigation is based on an assumption that West Coast green gecko will and can recolonise the rehabilitated landform (it is not clear whether this is an assumption) then substantial evidence (perhaps by way of research) is required to test this assumption. In response to a query about the ability of the West Coast green gecko to recolonise post-mine landforms - which was illustrated in Mitchell Partnerships (2013) by an unsubstantiated report of a West Coast green gecko on the post-mine landform of Marshalls Mine upper Waimangaroa Valley - the applicant was unable to provide evidence that West Coast green gecko can or would recolonise a rehabilitated landform, and the Marshalls Mine record was actually a forest gecko rather than a West Coast green gecko (M. Lettink, pers. comm., 2014).

If the proposed mitigation does not include in its accounting any recolonisation of the rehabilitated landform (i.e. any recolonisation of the landform by any of the three lizard species present is a bonus) then predator control alone as a mitigation technique will need to continue for many decades following mine closure to fully compensate for the complete loss of all lizards and lizard habitats over the footprint and access routes. Also, and as noted in Wildland

Consultants (2014), the most significant effect of implementing the proposal is the contribution that this mine will make on the cumulative degradation of a stronghold population of the West Coast green gecko. As such, the final mitigation package will also need to appropriately compensate for this cumulative effect on the stronghold for the threatened West Coast green gecko.

## **BATS**

This desktop evaluation is based on the further information provided by the applicant.

The applicant's assertion that it is unlikely that there are large populations of long-tailed bats (*Chalinolobus tuberculatus*) present within the project footprint is supported, and also that it is unlikely that short-tailed bats (*Mystacina tuberculata*) are present in the project footprint. The applicant also suggests that the closest populations of long-tailed bats are likely to be small compared to Fiordland populations. If this is the case then it provides even more reason for them to be well-protected if present, i.e. a more precautionary approach, not a less stringent approach.

It is clear that bat monitoring in the area, prior to that done for this project, was very limited, and as such cannot be relied upon to inform this project.

Despite a specific request for such information, no information has been provided on weather conditions during the surveys undertaken for this project and, as such, confidence in the surveys is relatively low. It is likely that weather conditions were not recorded at the time given their response. However, the applicant attempts to give confidence by saying that the weather was "fine and mild". Temperature, precipitation (and the time of precipitation) should be recorded if any further surveys are undertaken. Such information would give greater confidence in surveys. Bats are less likely to emerge from their roosts on cool, windy, wet nights, and therefore won't be detected.

The applicant's argument that bat detections are rare on the West Coast of the South Island is supported. However this does not indicate that bats are not present within the ecological district or within, or near, the project footprint, given that long-tailed bats were detected approximately 40 km to the north at Mokihinui River (O'Donnell 2012), and also within the same ecological district as much of this project footprint (Ngakawau Ecological District; O'Donnell 2012). Given that long-tailed bat home range spans (the distance from one edge of its home range to the other edge) can be 7-11 km across and home range sizes greater than 1,800 ha (median juvenile home range size; Borkin and Parsons 2011; O'Donnell 2001), the Mokihinui River long-tailed bat population is relatively close to the project footprint. Te Kuha provides suitable long-tailed bat habitat - a combination of foraging (particularly linear landscape features including along the canopy) and roosting habitats (trees that provide potential roosts) - consequently, it is still possible that long-tailed bats could use the Te Kuha project footprint.

## **PEST ANIMALS**

The visit to the Te Kuha coal mine site on 9-10 September 2014 raised further concerns regarding how coal mining activities on the ridge may lead to proliferation of vertebrate pests in the area. These concerns fall into three main areas:

- Lack of browse damage by mammals in the proposed mine area, the amount of short vegetation that could be browsed by hares, and the potential for a hare invasion along the proposed road.
- Anecdotal evidence that poor sanitation may have lead to the localised proliferation of rodents around the hut.
- The location and distribution of feral goats and feral pigs and how they might affect restorative plantings.

Mitchell Partnerships (2013) identified deer sign in 100% of 53 500 × 500 m grid cells in the mining permit area. This indicates that deer numbers may be high, and vegetation in the area frequently browsed. However, very little deer sign was observed during the field visit to the proposed mining area and its surrounds (some hoof prints were spotted in a dry tarn) and only very small amounts of browse by introduced mammals was observed. This suggests that the location may be relatively free of browsing impacts given that TBFree New Zealand regularly controls possums in the area. Hares do not currently occupy the ridge, but much of the proposed mine site and surrounding areas contains shorter vegetation that could easily be inhabited and browsed by hares (Plate 4). It is likely that that hares would invade the area along the proposed road. Hares are well known along forestry roads, and may have accessed parts of Fiordland National Park along them e.g. Green Lakes via the Borland Road.

Wildland Consultants (2014; Section 9.2, p27) stated that a number of studies overseas have shown that rats and mice prosper in areas of human disturbance in indigenous forest (although this is less well studied in New Zealand). A large amount of rat and mouse activity was found at the hut site. This included seed collection typical of rats on the hut steps (Plate 1) and rat and mouse scats throughout the hut (Plate 3). This activity was likely promoted by (a) the dry shelter provided by the hut, and (b) lack of cleanliness (Plate 2) of the hut which had rubbish, including food remains (e.g. open cans), strewn across the floor. The presence of such rubbish is a recipe for the promotion and proliferation of rats and mice which are predators of introduced birds, lizards and invertebrates. Rats and mice also form part of the prey base of stoats, which are also predators of indigenous birds, lizards, and invertebrates. Rat activity was evident in an approximate 100 m radius of the hut, with conspicuous rat scats and further seed caches observed on the boulders below the hut and beside the stream above the hut. Such rat activity was not observed at any location further away from the hut during the field visit. This suggests that rats may be using the hut as a focal point. Any mining activities - including any further survey work - need to maintain far higher levels of cleanliness and should consider on-site rodent control to prevent rodent proliferation. Invertebrate observations made during this field visit indicate that a number of large-bodied species are present that will be vulnerable to rodent predation.

Mitchell Partnerships (2014) identified feral goat sign in 13% of the aforementioned grid cells and feral pigs in 4% of grid cells. Feral goat sign was concentrated c.2 km north of the proposed mine site and feral pig sign was within 1 km of the proposed mine site to the west. Because the survey was 'one-off' and the vegetation in the area is dense, it is unlikely that the full distribution of these species were described for this area. Additionally, their distribution will change seasonally and over time. Feral goats and feral pigs pose a significant threat to the proposed restorative plantings and would need to be managed to prevent this. Their management would also be beneficial to forest health in the areas adjacent to the proposed mine.



Plate 1: Seeds collected by rats on the hut doorstep.



Plate 2: Rubbish strewn around the hut.



Plate 3: Rat scats on the hut bench.



Plate 4: An example of habitat that could be invaded by hares.

## **ECOLOGICAL SIGNIFICANCE OF THE TE KUHA MINE SITE**

Wildland Consultants (2014) concurred with Mitchell Partnerships (2013) that the *Te Kuha area* (which was assumed to mean the mining permit area) meets eight of the nine significance criteria listed in the Buller District Plan. Our assessment stated that the mine site (which includes the haul road) was likely to also be significant. However, we disagree with some of the interpretations of Mitchell Partnerships; for example, their conclusion that “*Te Kuha*” has “*only moderate representativeness value*”. Given the proposed mine site and its surrounds are virtually unmodified and intact, and have a full complement of fauna (birds, invertebrates, and reptiles) that might be expected, the area is clearly “*one of the best examples of an association of species which is typical of the ecological district*” (Buller District Plan).

The ninth criterion - scientific or cultural value - which was noted as potentially being met if either of the unidentified leaf-veined slug or *Rhytida*-like snail were found to be new species, is now more likely to be met. A further two unnamed species were recorded during this site visit, and an additional species is at its southernmost distributional limit.

Additionally, the site is now considered to be ecologically significant for invertebrates within the Ngakawau Ecological District, and at a national level, given the degree of naturalness and intactness of the site, and the suite of invertebrates associated with the habitats present, including a large number of unnamed species, and large-bodied species that are more susceptible to mammalian predation.

## **REFERENCES**

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