



LIZARD MANAGEMENT PLAN  
for the  
Waitaha Hydro Scheme

Date: 31 July 2025

## CONTENTS

<b>1. INTRODUCTION</b>	<b>1</b>
1.1 BACKGROUND .....	1
1.2 SCOPE .....	1
1.3 CONTEXT .....	1
<b>2. SITE OVERVIEW</b>	<b>3</b>
2.1 HYDRO PROJECT DESCRIPTION .....	3
2.2 LIZARD SURVEYS AND SPECIES .....	14
2.3 LIZARD HABITAT .....	15
<b>3. LIZARD SALVAGE</b>	<b>16</b>
3.1 APPROACH .....	16
3.2 TIMING AND CLIMATE .....	19
3.3 SALVAGE METHODS .....	20
3.4 LIZARD HANDLING AND PROCESSING. ....	21
3.5 DATA COLLECTION .....	21
<b>4. LIZARD RELEASE SITES</b>	<b>22</b>
4.1 SITE SELECTION AND SUITABILITY .....	22
4.2 RELEASE SITE MANAGEMENT .....	23
<b>5. REPORTING</b>	<b>24</b>
5.1 REPORTING .....	24
5.2 CREDENTIALS AND PERMITTING .....	24

## 1. INTRODUCTION

### 1.1 Background

Westpower proposes a run-of-the-river hydro-electric power scheme for the Waitaha River, approximately 60 km south of Hokitika on the West Coast of the South Island, New Zealand (the **Scheme**).

The Scheme is predominantly on the north (true right) side of the Waitaha River from Macgregor Creek to Kiwi Flat, immediately above Morgan Gorge, approximately 17 km upstream from the SH6 bridge across the Waitaha River.

The Scheme's proposed footprint lies within both private and public land. Most of the footprint area lies within unmodified indigenous vegetation of the Waitaha Forest Conservation Unit, being Stewardship Land administered by the Department of Conservation (**DOC**). The proposed activity within this area is predominantly on the north (true right) side of the river from Macgregor Creek to Kiwi Flat, above Morgan Gorge (**Figure 1**).

Construction of the Scheme will require the removal of habitats with the potential to support native lizards, with up to four species potentially present.

### 1.2 Scope

RMA Ecology Ltd was consulted on this Lizard Management Plan (LMP) in support of the vegetation clearance works within the footprint shown on Figure 1.

The purpose of this LMP is to describe the approach to the salvage of native lizards within the development footprint and their relocation to a suitable release site. The objective is to mitigate any actual or potential adverse effects on native lizard populations within the development footprint.

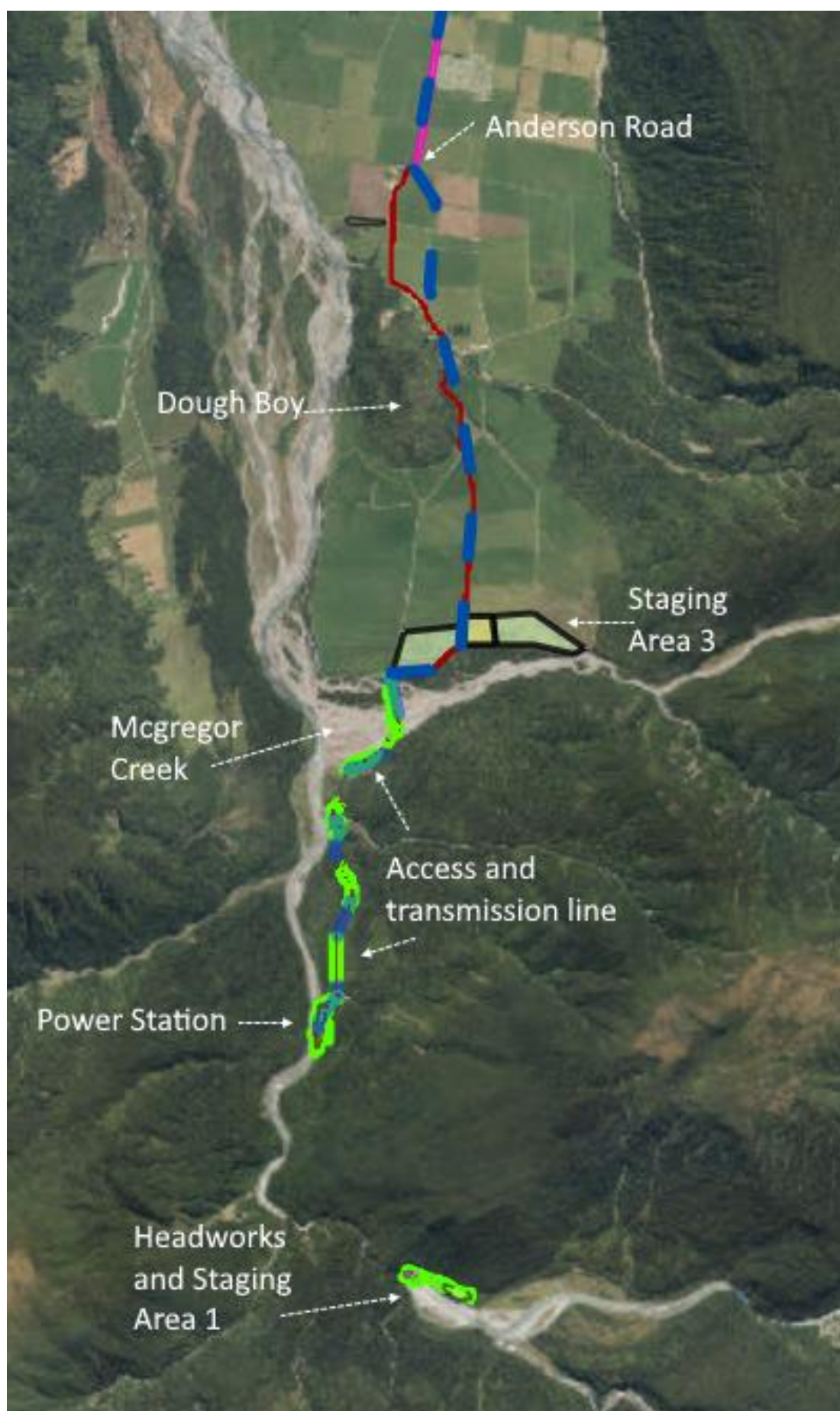
The Wildlife Act 1953 requires that an Authority be obtained where native lizards may be incidentally harmed or killed during the course of a site's development. This LMP will support an application for a Wildlife Act Authority under the Fast-track Approvals Act.

### 1.3 Context

The purpose of this LMP is to clearly set out the necessary actions and requirements to be completed during construction of the project to avoid as far as practicable and otherwise minimise adverse effects on lizards. In this way the LMP implements the requirements of the Wildlife Act 1953 and links into and provides detail for the conditions under the Fast-track Approvals Act 2024.

While no lizards have been found during investigations to date, the habitat within the project footprint has a moderate lizard value and there is the potential for lizards to be present in very low numbers (noting they are cryptic species). This LMP is designed to be easy to understand and implement for the construction workforce.

RMA Ecology Ltd prepared a detailed lizard assessment report for Westpower's applications under the Fast-track Approvals Act 2024. That report provides a fulsome background, context and detail as the potential effects of the project on lizards.



**Figure 1.** Waitaha scheme, showing key areas referred to in the text.

## 2. SITE OVERVIEW

### 2.1 Hydro project description

The Scheme is a run-of-river hydroelectric power scheme with no instream storage. The parts of the proposed scheme are shown on **Figure 1** and presented in detail in **Figures 2- 7**. Vegetation present within the Scheme's footprint and in its surrounds is primarily indigenous, with an increasing exotic plant component moving from the Headworks at the entrance to Morgan Gorge, to the Power Station at Alpha Creek, and through to the Spoil Disposal Areas and Construction Staging Area 3 on established farmland on the true right of Macgregor Creek (**Figure 1**).

Total clearance of indigenous vegetation is approximately 6.8 ha across the Headworks (including pre-construction test drilling sites), Power Station, access/transmission route from the Power Station through to Macgregor Creek, and to the Anderson Road boundary of the farm. No lizards were found at the Construction Staging Area 3 / Spoil Disposal Areas (20 ha).

The transmission line corridor from Anderson Road through to SH6 and to the existing Waitaha Substation supports indigenous scrubland along parts of the route; however, any vegetation clearance along that route are already covered by existing consents for the maintenance of vegetation beneath existing powerlines, and therefore any effects on potential lizard habitat are not included in this assessment of lizard habitat or covered under this Lizard Management Plan. As such this LMP does not discuss vegetation or potential lizard habitat north of the Anderson Road farm boundary.

Post-construction permanent vegetation loss will be 4.5 ha (excluding the Construction Staging Area 3/Spoil Disposal Areas (20 ha) on the right of Macgregor Creek), as 2.3 ha of cleared vegetation will be re-vegetated following completion of the construction works.

The principal forest types within the Scheme's footprint below Morgan Gorge are broadly grouped as kamahi forest (establishing, regenerating or mature) and seral forest (also establishing, regenerating or mature), with sub-communities often clearly demarcated by different topography such as above and below terraces, or between alluvial river flats and forest margins. The most northern parts of the Scheme – access road upgrades and Spoil Disposal Areas / Construction Staging Area 3 – are within highly modified exotic grassland communities, most of which are managed as grazed pasture, along with minor track upgrades through the side of the Doughboy, which supports regenerating hardwood shrubland.

The lizard assessment has considered the Scheme as five geographically distinct parts within the project footprint, which are described below; and this geographic partitioning is retained for this LMP, for practical reasons.

**Figures 2 – 7** provide a closer view of each of the geographic areas over which lizard salvage and relocation is proposed. Photos are provided in **Plates 1-12**.

- (a) **Headworks** at the head of Morgan Gorge – successional hardwood shrubland on the terrace on the true right of the Waitaha River above Morgan Gorge, where the temporary Construction Staging Area 1, including temporary road to the Staging Area from the access portal, is proposed (**Figure 2**). A permanent accessway will also be established from the access portal to the riverside. The canopy of this area is up to 3 m tall within the eastern and

central portion and comprises mostly dense shrubland with a high presence of divaricating species, poor quality understorey, and lacks large woody material.

Towards the western part of the area (towards the proposed portal and surrounds), the vegetation is older and comprises canopy species (dominated by puka) up to 8 m tall, abundant fallen and standing woody materials/whole trees, and thick ground cover. Light wells are rare, and well-lit areas are limited to edges on the alluvial terrace over the river.

Up to seven test drilling sites are proposed between the Headworks and Power Station sites (**Figure 7**), with each requiring clearance of around 10 m x 10 m to support drilling activities. Five of these locations are within established mature forest.

- (b) **Power Station and Construction Staging Area 2 (Figure 3)** – Most of this area is an alluvial terrace and supports grassland with sparse shrubs and trees with underlying gravel fans and river stone accumulations. Much of the area is open and exposed to the sun. The hill foot slopes adjoining the terrace support mature closed-canopy podocarp/hardwood forest.
- (c) **Transmission line and access road (Figure 4)** between the Power Station and Macgregor Creek – low outwash river terrace along the route supports kamahi and seral forest up to 10 m tall, with occasional emergent rimu. Forest gaps are few and the canopy is closed. Parts of the terrace support wetlands or poorly draining substrates.

Ground cover is impacted significantly by exotic mammalian browsers. The alluvial outwash fans of Macgregor Creek (true left) support a mosaic of toetoe and exotic grasses over gravels, with occasional gorse and native shrub cover (sparse).

- (d) **Spoil Disposal Areas and Construction Staging Area 3 (Figure 5)** – this approx. 20 ha area supports colonising/ pioneering shrub hardwood on the riparian margin (where the transmission line and access road from the Power Station land on the true right of Macgregor Creek), and non-indigenous, partially developed farmland with woody weeds over dominant introduced grasses and broadleaved herbaceous weed species.

Both areas overlie alluvial terraces where river stone substrates are exposed and form heaped features amongst thin soils. The river margin shrubland is partially open, while the pasture areas are fully open to the sun.

- (e) **Transmission line and access road** corridor between Macgregor Creek and the northern farm boundary with Anderson Road (**Figure 6**). This route follows an established farm track that is ca. 4 m wide. The track will be upgraded to a 10 m wide track, including shoulders and table drain. Vegetation clearance will be mostly exotic pasture grasses on the margins of the existing road. Over one short stretch (ca. 200 m), woody vegetation on either side of the existing road may be cleared up to 1 m wide, although the certainty of this will not be known until detailed design.





**Figure 2.** Headworks general layout, with the temporary access road (grey line) and construction laydown area (green shaded polygon) to the east of the portal as the main features that may support native lizards. The extent of proposed construction disturbance/ vegetation clearance is shown as the hashed green line.





**Figure 3.** Power Station general layout showing most works located in an open, sparsely wooded alluvial flat. The transmission line and access road corridor (to the top of the figure at Alpha Creek) is within the start of regenerating kamahi forest.





**Figure 4.** Access road north of Power Station (left image) and portion south of Macgregor Creek (right image). The access road is shown by the red line, with the total disturbance boundary shown by the green dotted line.



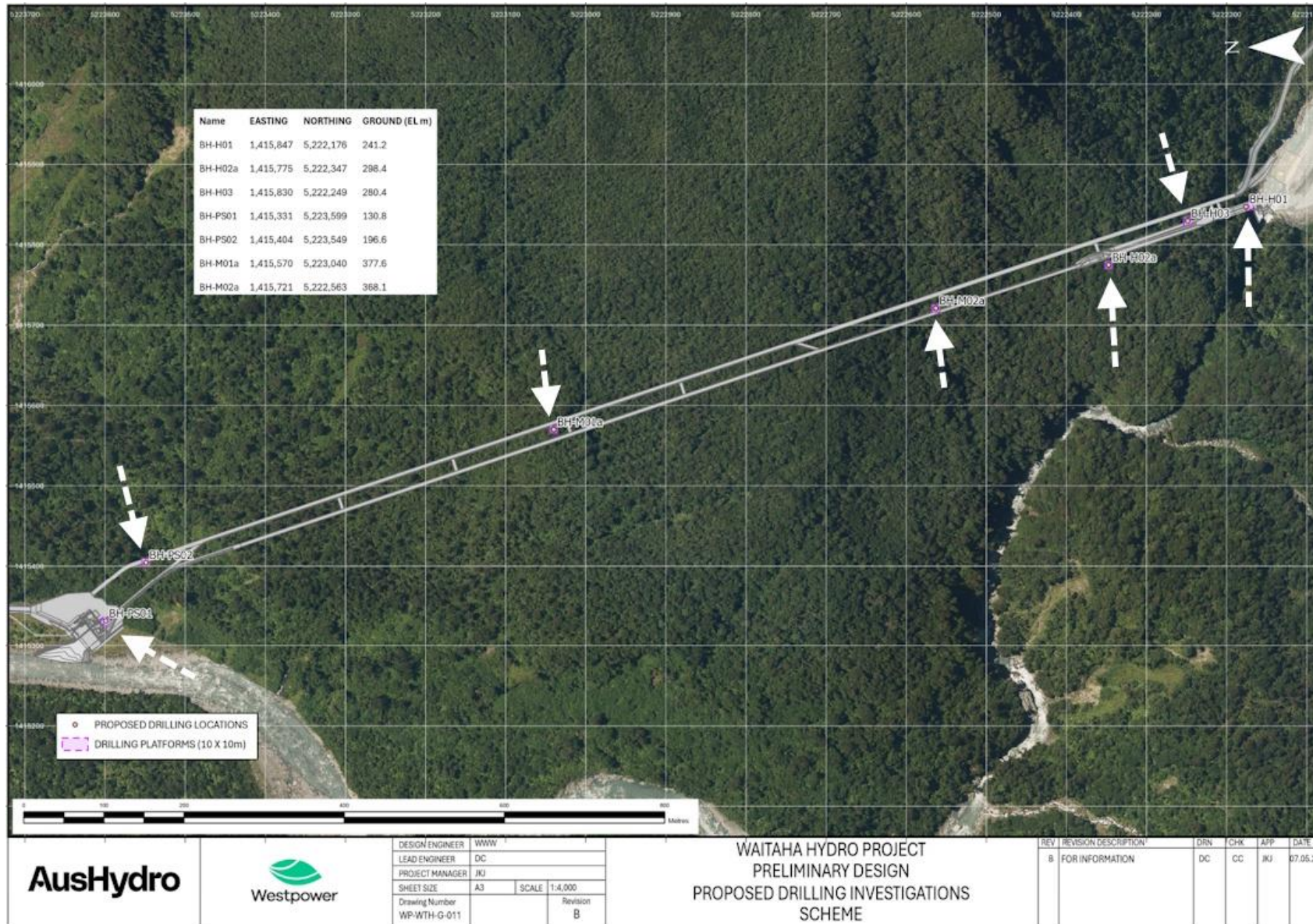


**Figure 5.** Spoil disposal (shaded green) and construction staging Area 3 (shaded yellow) on the true right bank of Macgregor Creek. The red dotted line is the main access through the farm to the site.



**Figure 6.** The Doughboy (forested hill) with proposed main access road shown in red, which follows an existing farm road. The upgrade of the road from a 4 m farm track to 10 m wide access track along its current alignment (red line), and the addition of a transmission line (not shown on figure) will involve works within a portion of the eastern side of the Doughboy (generally, the yellow box) and this may require some limited woody vegetation clearance, as well as clearance along the existing rank grass shoulder.





**Figure 7.** Location of pre-construction works test drilling sites (indicated by white arrows), between the Power Station (left of image) and Headworks (right of image).





**Plates 1-4.** Regenerating mixed hardwood shrublands at the proposed Construction Staging Area 1 on the terrace above the true right of the river at Morgan Gorge. Shrublands are diverse, divaricating, dense, and up to 3-4 m tall, with some parts where the forest structure is older, with taller, more open canopies, and greater amounts of dead wood and thicker ground cover. These offer potential habitat for West Coast green gecko and forest gecko.





**Plates 5-8.** The low alluvial terrace at the Power Station site comprising of deep river gravels with large patches of low toetoe and sparse divaricating shrubland cover. This location is of good quality potential habitat for sun-loving skinks, but is poor quality potential habitat for West Coast gecko and forest gecko. Large items of wood are rare, stone piles are locally common.





**Plates 9-12.** The southern end of the transmission/access corridor has regenerating kamahi-free fern forest up to 8 m tall (top left and top right). Canopy closure is complete. The understorey has been significantly impacted by browsing animals. Potential habitat quality is moderate for forest gecko. The true left of Macgregor Creek (where transmission and access route from the Power Station exits to the Creek) has margins strewn with boulders, cobble banks and large woody materials (root wads, tree trunks) (bottom left). The margins of the Creek grade into short weedy and hardwood communities, and thereafter, taller hardwood shrubland communities with the occasional dead standing or live relict mature tree (bottom right). The combination of stable boulders, vegetation, open, closed, low, taller and dense communities provide potential habitats for ground-dwelling skinks.

## 2.2 Lizard surveys and species

Seventeen lizard species (7 geckos, 10 skinks) are currently recognised from the West Coast region (as defined by boundaries of the DOC West Coast/Tai Poutini Conservancy) and there are unverified records of two others, both geckos. Eight species of lizards have been recorded within 20 km of the Project Site, of which three (possibly four) species could be present within the Scheme footprint.

The species that could be within the Scheme area include forest gecko (*Mokopirakau granulatus*; At Risk – Declining), West Coast green gecko (*Naultinus tuberculatus*; Threatened - Nationally Vulnerable), northern grass skink (*Oligosoma polychroma*; Not Threatened), and possibly Newman's speckled skink (*O. newmani*; At Risk – Declining). Compared to the gecko species and grass skink there is a smaller chance the Newman's speckled skink is present in the habitat of the Scheme area. However, it has similar gross habitat needs as grass skink so this cannot be completely discounted.

The investigations for lizards at the site took place over three time periods:

- 2013 – survey by Tony Whitaker (Whitaker Consultants Ltd) of two cutover shrubland areas near to (but not within) the Scheme's footprint. The survey was undertaken over February 2013 over several days and nights under cool conditions. Methods used included daytime visual encounter survey, manual search of refuges for skinks and geckos, and nighttime spotlighting over multiple nights for active geckos. No sign of lizards, faecal pellets or slough skins were found.
- 2024 – survey by RMA Ecology Ltd; see **Appendix C** in the **Lizard Report** for details. A visual and manual search was undertaken in early August 2024 of the different habitat types, along with a manual search of the terrace river gravel areas around the Power Station Site to look for faecal pellets and slough (2 hr persons search effort through stone piles, under logs, within divaricating shrubs).
- A further survey was undertaken by RMA Ecology Ltd over mid-October (1 week) and mid-December 2024 (1 week) under ideal weather conditions for lizard activity (see **Appendix C** in the **Lizard Report** for details). Areas surveyed were the true left bank of Macgregor Creek adjoining the transmission line and road access route (low shrubland, river margin, cobble fan and terraces), and throughout the proposed Construction Staging Area 3 and Spoil Areas (old terraces, pasture, stone piles). Methods used included visual encounter (basking), ACO refuges, pitfall trapping, gees minnows, and manual search. No sign of lizards, faecal pellets or slough skins were found.

None of the surveys found signs of lizards – either whole animals, slough or faecal pellets, despite searches over three distinct times, and in areas covering parts of the Project Site and within habitat and vegetation communities that are representative of lizard habitats within the Scheme's footprint. The lack of results from surveys within the Spoil Disposal Areas / Construction Staging Area 3 and Macgregor Creek margin areas provides a high level of certainty about the absence of lizards. If lizards were present in those areas, the suite of methods that we employed, within the active season for lizards, should have detected them. We can state with a high level of certainty that native lizards are not within those areas.



Discussions with local residents or contractors on the Project site also found that:

- The farmer that runs the large farm upon which the proposed disposal and staging areas will be located mentioned that he had last seen lizards last year (2023) on the ground at the farm but, could not pinpoint where (except that it was not within the disposal and staging area location). He could not confirm whether he had seen native, exotic, skink, or gecko species.
- Contractors working for Westland Schist Ltd which obtain rock from the Waitaha River and a tributary bordering the proposed footprint, mentioned (2024) that they had not seen any lizards in the 30+ years they had been working there. Their activities included work around the margins of rivers and streams where day-active and heliophilic lizards would be expected to reside, bask, and take refuge under rock, if present, and would be obvious to those working extensively around river margins, as this contractor does.

Despite finding no lizards over the surveys, our opinion is that there is a moderate likelihood of native lizards being present within the Project Site given the large, geographically spread-out distribution of the footprint across multiple habitat types (pasture, gravel, shrubland, riparian edge, forest) and landforms (alluvial fan, terrace, slips, young and old landforms). We exclude Construction Staging Area 3 and the Spoil Disposal Areas from this assertion, as the October/December 2024 survey for lizards in that area was comprehensive and found no lizards.

That no lizards were found despite intensive search efforts over parts of the site indicates that lizards are either locally absent or present in very low numbers and are most likely sparse throughout the footprint, if indeed present. The lack of specific surveys across parts of the Project Site (e.g. Power Station Site during summer, and forest areas along the Scheme footprint) does not imply that a different conclusion could be reached with more surveying – simply because it is expected that lizards would be detected if they were in reasonable population health throughout the catchment. Given what is widely known about their cryptic nature, low densities and the difficulty of detection using standard survey techniques in the West Coast forest areas, this expectation remains.

The area of potential lizard habitat affected by the Scheme is small relative to the abundance of habitat within the Waitaha catchment and locally within other catchments.

### 2.3 Lizard habitat

Although the findings from surveys conducted elsewhere within the Scheme footprint could reasonably be applied across the entire Scheme footprint, there are four areas where lizards have not been surveyed to directly ascertain their absence, and where habitat disturbance will occur.

Therefore, like other areas, it has been conservatively assumed that there is a potential moderate likelihood of lizards being present within these sites, such that a salvage and relocation is required.

The areas within the Scheme footprint total 6.8 ha of potential lizard habitat which will be cleared:

- **Headworks** at the head of Morgan Gorge and **Power Station** – where approx. 1.0 ha of indigenous vegetation in total will be cleared (includes 7 x test drill sites).
- **Transmission line and access road** between the Power Station and Macgregor Creek – where approx. 5.6 ha of indigenous vegetation will be cleared.

- **Transmission line and access road upgrade** along the eastern edge of the Doughboy, where approx. 0.2 ha of indigenous vegetation will be cleared.

Potential habitat suitability within each of these locations for lizards is presented in **Table 1**.

**Table 1.** Description of the four discrete areas of the scheme footprint where lizards may be present and estimated search/ salvage effort that will be applied prior to vegetation clearance.

Salvage location	Area that will be cleared	Habitat features	Potential suitability for which lizards	Est. salvage effort
Headworks	Ca. 0.5 ha	<ul style="list-style-type: none"> <li>• 3-4 m tall up to 8 m</li> <li>• Diverse, divaricating shrublands</li> <li>• Taller forest with abundance large trees and fallen dead wood</li> <li>• River shrubland edge</li> </ul>	West Coast green gecko Forest gecko	20 person hours
Power Station	Ca. 0.5 ha	<ul style="list-style-type: none"> <li>• Deep river gravels. Rockpiles</li> <li>• Toetoe and divaricating shrubs</li> </ul>	Oligosoma skinks West Coast gecko (in part)	15 person hours
Transmission line and access road	5.6 ha	<ul style="list-style-type: none"> <li>• 8 m tall kamahi forest</li> <li>• Small patches of divaricating shrubland</li> <li>• Closed canopy</li> <li>• Bare understorey and poor ground cover</li> </ul>	Forest gecko West Coast green gecko	15 person hours
Transmission line and road access upgrade along Doughboy	0.2 ha	<ul style="list-style-type: none"> <li>• regenerating hardwood species</li> </ul>	West Coast green gecko  Oligosoma skinks	30 person hours

### 3. LIZARD SALVAGE

#### 3.1 Approach

Our approach for this LMP is guided by the findings of the past surveys completed in 2013 and 2024, the habitat preferences of native lizard species, the availability of habitat at the Project Site, and the history and land use of the Project Site and the surrounding area.

Salvage methods are assigned to each vegetation type according to their effectiveness and technical feasibility, and the likelihood of lizards occupying each vegetation type.

The overall approach for this LMP will be to focus on ensuring effective, practicable lizard salvage methods are used and include an ongoing assessment of the efficacy of methods, timing, and the search effort required.

Based on the results of the Project Site surveys, and given the results of lizard surveys within similar West Coast environments, it is expected that native lizards will be locally absent or at very low levels within the clearance areas of the Scheme footprint, and will be very difficult to detect or catch, especially in established, tall tree areas.

Therefore, **the methods used for salvage will favour the use of active pre-clearance survey techniques**, rather than direct supervision of habitat deconstruction, or the use of extensive passive and active trapping techniques prior to habitat disassembly.

Further, because the likelihood of detecting lizards within the Scheme footprint is small, **the methods and effort proposed is** not extensive nor is it exhaustive, rather it is **proportional to the (low) likelihood of lizards being present and being able to be caught within the footprint.**

Where searches detect lizards, there is provision for continuing effort until detection falls to a low number or nil.

The techniques that will be used at the site are:

- **Manual search of ground habitats;**
- **Basking lizard searching** – shrubs and ground environments; and
- **Machine-assisted salvage** – supervision of surface excavation at the Power Station site of rock piles, removal of large logs, disassembly of large dead wood and grasses, and careful clawing back of thick ground plants **in representative areas of the higher quality habitat of the Power Station footprint** to assess whether lizards are present. If lizards are detected, salvage across the Power Station footprint will be undertaken.

Searches of recently felled trees for arboreal lizards are not possible, as it is not feasible to use arborists to individually fell vegetation across the many hectares of woody vegetation proposed for clearance. Likewise, because the occurrence of lizards across the site is predicted to be very sparse, **there is unlikely to be any added benefit to applying extensive night spotting or repeated daytime searches over areas**, especially for the mature hardwood forest between the Power Station and Macgregor Creek. Even if lizards are detected high up trees, it will be practicably difficult to reach them.

Instead, emphasis will be placed on **daytime searches of woody vegetation prior to clearance.**

The above will be used in conjunction with preventive methods – mitigation methods – that will be applied to parts of the Project Site to limit the need for salvage. These include:

- (a) **Removal of cut shrubland to footprint edges (where practical)** for storage and use as site rehabilitation supplies.
- (b) **Moving large logs to the side of the Scheme footprint (where practicable).** This ensures that any lizards within logs (e.g. within cracks, crevices or rotten parts of logs) will be unharmed, and the log habitat will be retained intact.

It is difficult to estimate the number of native lizards that may be encountered. However, based on the limited success of lizard salvage activities during the 1980s and 1990s (Tony Whitaker, *pers. comm.*), we assume that the following numbers of lizards listed below would be **the maximum expected from a salvage operation** in the Scheme footprint:

- |                                  |    |
|----------------------------------|----|
| • Forest gecko                   | 20 |
| • West Coast green gecko         | 20 |
| • Oligosoma skinks (grass skink) | 50 |

The approach of this salvage follows the principles set out by DOC for lizard salvage and transfer in New Zealand<sup>1</sup> (**Table 2**).

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<sup>1</sup> Department of Conservation Lizard Technical Advisory Group (2019). Key principles for lizard salvage and transfer in New Zealand. Department of Conservation, Wellington.

**Table 2.** Assessment of the salvage approach against the principles set out by the Department of Conservation for lizard salvage and transfer in New Zealand.

Principle	Assessment
1. Lizard species' values and site significance must be assessed at both the impact (development) and receiving sites.	<p>While no lizards, or sign of lizards have been found, due to the vegetation types and their cryptic nature the Project Site has been assessed as having moderate lizard values, that at most, it is likely to contain only West Coast green gecko, forest gecko and grass skinks at a very low density.</p> <p>The receiving sites all adjoin the salvage sites – with duplicate habitat to each of the salvage sites.</p>
2. Actual and potential development-related effects and their significance must be assessed.	<p>The development-related effects that may involve disturbance and possible death of indigenous lizards for the Scheme are no more than minor, but taking a conservative approach to reduce effects even further, a lizard salvage and approach is being adopted. As such, this LMP proposes a salvage to minimise injury and death of native lizards, and improvements to habitat at the release sites.</p>
3. Alternatives to moving lizards must be considered.	<p>The Scheme footprint requires the clearance of potential lizard habitat to allow for access and construction of the Scheme.</p> <p>Minimisation of the area of potential lizard habitat clearance has been achieved as part of the Scheme design through engineering design to provide access to the Headworks via the tunnel rather than establishing a separate road, and to have the access road cater for access and transmission (therefore reducing overall width).</p>
4. Threatened lizard species require more careful consideration than less-threatened species.	<p><b>West Coast green gecko is Threatened – Nationally Vulnerable, forest gecko is At Risk species</b>, and grass skink is Not Threatened.</p> <p>The design of the Scheme has taken into account the need to minimise vegetation clearance, which also minimises the loss of potential lizard habitat. <b>The overall loss of potential habitat is a fraction of 1 % of that available locally within the Waitaha catchment and the local area (including catchments nearby).</b></p>
5. Lizard salvage, transfer and release must use the best available methodology.	<p>The methods proposed are a subset of the total methods available. The selective use of methods is appropriate for this Scheme because any lizards that are present are likely to be at very low density making pitfalls, ACOs, gees minnows, and trunk traps ineffective. <b>Instead, we have focussed on applying manual search, daytime basking search, and machine-assisted search, prior to clearance</b> to maximise the chances for finding and salvaging lizards.</p>



6. Receiving sites and their carrying capacities must be suitable in the long term.	<p><b>Receiving sites will adjoin salvage areas</b> as follows:</p> <ul style="list-style-type: none"> <li>• Headworks – adjoining areas of shrubland, as only part of the available shrubland will be cleared.</li> <li>• Power Station – adjoining areas of terrace shrubland grassland, as only part of the available habitat will be cleared.</li> <li>• Access/transmission corridor and Doughboy – there is abundant kamahi/ hardwood forest surrounding the route.</li> </ul> <p><b>Any lizards salvaged will be temporarily held for up to 3 days</b> to ensure that immediate habitats are completely cleared prior to release.</p> <p>During construction, there will be contribution to an ecosystem programme in the region for a ten-year period to benefit whio, for example the Zero Invasive Predators programme commencing on construction of the Scheme. An ongoing contribution to an ecosystem programme will continue for the life of the consent. Predator control may be considered the best method of supporting the ecosystem in the region or locally in the Waitaha Valley during that period or innovative or different methods may be preferred. In the future, release sites may therefore be subject to animal pest control, or another form of support.</p>
7. Monitoring is required to evaluate the salvage operation.	<p>No post-release lizard monitoring has been proposed – simply because it is unlikely that a significant number of lizards will be released (i.e., less than 20 individuals of each species of gecko and less than 50 for skinks) and because there is a low likelihood that the results will provide a statistically meaningful insight in relocation success and monitoring to robustly record baseline, change in state, and resident versus released animal trends will impose an exceptionally high cost on the project.</p>
8. Reporting is required to communicate outcomes of salvage operations and facilitate process improvements.	<p><b>A salvage report will be prepared and submitted to DOC</b> following the completion of any lizard salvage and relocation.</p>
9. Contingency actions are required when lizard salvage and transfer activities fail.	<p>If, for any reason, the salvage or transfer activities prove to be ineffective (acknowledging the difficulty of actually measuring whether a salvage programme is ineffective), then the project ecologist will halt operations and revise a plan in consultation with DOC. This may include, but not be limited to, a reworking of methods, a revision of the spatial scope of the salvage area, a change in the required resources, or a change in the release site.</p>

### 3.2 Timing and climate

Lizard salvage will be undertaken during the active season for lizards on the West coast, which is generally accepted by as being from October to March.

Lizard salvage will only be carried out during fine, mild weather conditions, generally when daytime temperatures are between 12-20 degrees Celsius, and not during periods of rain.

**If habitat clearance is to be undertaken outside of the active lizard season**, no methods of lizard salvage will be applied (as any methods are unlikely to be effective at detecting lizards outside of the active season). However, **the consent holder will discuss providing a financial payment to DOC for use on native lizard recovery and conservation works in the local area**

**or on the West Coast.** This payment would be intended to provide conservation benefit in lieu of benefit provided from the salvage and relocation of native lizards from the Scheme footprint.

### 3.3 Salvage methods

The techniques that will be used at the site are listed below. See **Table 3** for an explanation of how the methods will be applied to each part of the site.

- Manual search of ground habitats where feasible.
- Basking lizard searching – shrubs and ground environments; and
- Machine-assisted salvage (Power Station site only) – supervision of surface excavation of rock piles, removal of large logs, disassembly of large dead wood and grasses, and careful clawing back of thick ground plants.

**Table 3.** Methods and their application for salvaging native lizards at the Waitaha Hydro Scheme site. Access track widening around the Doughboy will be searched if woody vegetation is cleared for that widening.

Salvage location	Area that will be cleared	Target species	Methods (in chronological order) for each location
Headworks	Ca. 0.5 ha	West Coast green gecko Forest gecko	1. Extent of clearance physically marked out on the ground or GIS mapped. 2. Daytime search for arboreal geckos & manual search for skinks x 1 day. 3. Full clearance.
Power Station	Ca 0.5 ha	Oligosoma skinks West Coast gecko (in parts)	1. Extent of clearance physically marked out on the ground or GIS mapped. 2. Manual search of ground habitats by hand/ hand tools x once 3. Machine-assisted search of representative areas which will be a selection of clumping plants (toetoe/ grasses) and logs, and selection of gravel/ stone piles x once, comprising 5% of the Power Station site. 4. Clearance.
Transmission line and access road to Macgregor Creek	5.6 ha	Forest gecko West Coast green gecko	1. Centreline of clearance physically marked out on the ground or GIS mapped. 2. Day-time search for geckos x once along entire route 3. Clearance.
Transmission line and access road upgrades at Doughboy	0.2 ha	West Coast green gecko Oligosoma skinks	1. Centreline of clearance physically marked out on the ground or GIS mapped. 2. Manual search of ground habitats by hand/ hand tools. 3. Daytime search for arboreal geckos x once 4. Clearance

Explanation of methods:

#### (a) Manual search:

- Careful observation of sunlit areas to spot basking lizards on shrubs and open ground. A drone may be used – in conjunction with ground-based searches - to spot basking lizards in canopy heads; and
- Use of hands and hand tools to rake through leaf litter packs, pull apart rotten logs, roll or lift smaller logs, and disassemble stone piles.

(b) **Machine-assisted salvage:**

- The project ecologist will work with an excavator operator and machine to turn over large material – rocks, logs, debris piles – in 5% of the higher quality habitat around the Power Station site only (being the representative areas).

If any lizards are salvaged within the representative areas surveyed, the appropriately qualified ecologist will continue to search for lizards in each representative area of a sighting or capture for 24 hours (to capture as many lizards as possible). Clearance of each representative area of a sighted or captured lizard can commence following the 24 hour search.

3.4 **Lizard handling and processing.**

Any relocation will be undertaken in the most appropriate way to minimise stress on lizards. To ensure the welfare of animals during relocation and to maximise the chance of a successful relocation outcome; at all times for vegetation clearance a staff member or contractor suitably trained in the capture, handling, holding and release techniques will be present onsite in case a lizard is identified. Handling will be limited to capture, release, measurement, and photography and follow the conditions of the Wildlife Approval.

The trained person must sterilise any instruments that come in contact with the lizards and/or are used to collect or measure lizards between each location. A separate holding bag must be used for each animal. All equipment should be thoroughly cleaned and dried between sites.

The trained person must ensure lizards are held temporarily in a suitable container (e.g. breathable cloth bag) and placed out of direct sunlight to minimise the risk of overheating, stress and death between capture and salvage, and relocation to the adjoining receiving site.

**Lizards salvaged from the site will be held for a maximum of 72 hrs before release.** This will enable the immediate site at which the lizard was captured to be completely cleared of possible refuges or other habitat for lizards and discourage their return. If clearance cannot occur within the 72 hrs, for example due to weather or equipment failure, lizards will be released to an appropriate site.

3.5 **Data collection**

The following data will be recorded on pre-prepared field datasheets:

- Species of lizard;
- Date of capture;
- Capture technique;
- Photos of dorsal, ventral and head;
- Obtain buccal swab for DNA analysis - if required by DOC;
- Age class (adult, sub-adult, juvenile); and,
- GPS coordinates of capture site.

## 4. LIZARD RELEASE SITES

### 4.1 Site selection and suitability

Salvaged lizards will be kept for up to 72 hrs and then will be released into vegetation and habitats similar to those where each individual was caught.

Where possible, release areas will be no more than 100 m from the point of salvage, unless a superior release habitat is further away, with a limit of 500 m from the site of salvage. Where DOC administered land is more than 500 m away from the point of salvage, the proposed release site is the closest suitable lizard habitat.

**Table 4** provides an assessment of release site suitability.

**Table 4.** Proposed release site suitability.

Suitability factor	Proposed release site description
Suitability of existing habitat	The release sites adjoining the Headworks, Power Station and Doughboy access road /transmission line corridor salvage areas are very similar to the respective vegetation types that will be cleared at these sites.
Proximity of the site from the salvage	The release sites will be within 100 m of the salvage locations. If a superior release habitat is further away, a maximum of 500 m will be applied to the release sites distance from the salvage site.
Long-term protection of the site	The preference for release sites will be within land administered by DOC
Accessibility for release	The proposed release sites will be easily accessible from the salvage site as the clearances are (mostly) for the purpose of creating vehicle access tracks.
Size of the release site and its connectivity to other habitat	<p>The approximate areas of suitable habitat within or surrounding the proposed release sites are:</p> <ul style="list-style-type: none"> <li>• Headworks low shrubland – 2.8 ha on river terrace surrounding the site.</li> <li>• Power Station low grassland/ terrace/ shrubland – 0.5 ha surrounding the site, and further 7.5 ha downriver within 500 m.</li> <li>• Access road/ transmission line from Power Station to Macgregor Creek corridor kamahi forest – 18 ha surrounding the site.</li> <li>• Doughboy access road and transmission line – regenerating hardwood scrubland ca. 10 ha surrounding the site.</li> </ul>
Existing lizard populations	No lizards have been found within the Scheme footprint; however, it is considered that there is a moderate likelihood that forest gecko, West Coast green gecko, and grass skink may be present, albeit in very low numbers.
Habitat enhancement opportunities	All of the release sites are naturally occurring ecosystems. Habitat augmentation is not considered necessary or appropriate.



Where practicable, vegetation cleared from the Scheme footprint will be placed along the edge of the cleared parts of the site to provide long-term habitat improvements (for ground-dwelling lizards only).

Existing predator control or opportunities to enhance predator control	A contribution to an ecosystem programme to benefit whio in the region, for example, the Zero Invasive Predators programme, is proposed in Fred Overmars' Whio Report. The contribution to an ecosystem programme will commence on construction of the Scheme for a ten-year period, with an ongoing contribution to an ecosystem programme for the life of the consent.
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#### 4.2 Release site management

During the construction and operation of the Scheme, Westpower has discussed with DOC a contribution to an ecosystem programme in the region managing the Project's potential less than minor effects on protected wildlife.

To manage potential adverse effects on native lizards, either predator control or a contribution to an ecosystem programme is supported.

## **5. REPORTING**

### **5.1 Reporting**

A salvage report will be provided to DOC at the end of vegetation clearance for the project. The report will detail:

- The methods applied;
- The number of lizards salvaged and where they were released; and
- Data collected as described in **Section 3.5**.

The summarised results of the salvage programme will be reported to DOC by way of an ARDS card.

### **5.2 Credentials and permitting**

This LMP has received input from Dr Graham Ussher, who is a qualified herpetologist and the methods and mitigations are supported.

All lizard salvage work will be undertaken in accordance with a current Wildlife Act Authority.