7.1 Potential adverse effects on lizards

The potential effects of the Project on lizards have been assessed as:

- Indigenous lizard injury or death, including during vegetation clearance and construction activities;
- Disturbance; and
- Loss of habitat.

The protocols set out in this plan, together with the broader measures described in Chapter 3 of the ELMP, address those potential effects.

7.2 Protocols

7.2.1 Introduction

The protocols specified below are consistent with standard methodologies from DOC's *Inventory and Monitoring Toolbox: Herpetofauna* (DOC 2012), and have been applied successfully on many NZ Transport Agency road construction projects. The protocol methodologies have been adapted for local site conditions.

7.2.2 Project lizard ecologist

The Project ecologist responsible for leading all indigenous lizard surveys, monitoring and salvage will be a suitably qualified lizard ecologist. More than one Project lizard ecologist may be appointed to work on the Project. All decision-making and technical inputs on fieldwork will be the responsibility of the Project lizard ecologist(s). All ecologists and sub-contractors who will contribute to the herpetofauna work required before, during and after construction shall be suitably experienced in lizard surveys and safe handling of lizards.

7.2.3 Protocol A: Identification of indigenous lizard habitats

All high risk habitats along the Project area will be delineated and surveyed by the Project lizard ecologist(s) prior to vegetation clearance. High risk habitat for indigenous lizards is limited to selected individual trees with high epiphyte loading (five or more perched nested epiphytes located on horizontal branches), areas of native scrub, wood piles and existing sheds and other structures proposed for demolition. Trees with high epiphyte loading will potentially overlap with trees that are considered potential bat roost trees or labelled as significant trees within this ELMP. All high risk habitat will be identified and demarcated by the Project lizard ecologist(s).

A Vegetation Mapping exercise will be undertaken for each vegetation removal area will be developed prior to vegetation removal and will be used to guide the selection and location of the salvage methodologies as described in Section 7.4.4. Three areas of vegetation mapping have been undertaken already and are shown within Appendix A. The locations of all high risk epiphyte trees and areas of native scrub (also identified by the survey) will be recorded with hand-held GPS units and, where appropriate, clearly marked with flagging tape and/or fluorescent spray paint.

Commented [LA1]: Need clarity on whether all 3 areas identified will be searched. Does "high risk" used here equate to "high value" in the appendices?

7.2.4 Protocol B: Indigenous lizard salvage

Salvage methodologies will only be undertaken during the period from 1st September to 30th April inclusive. Indigenous lizard salvage will be undertaken using the methodologies described below. Specific salvage methodologies to be utilised will be guided by the Project lizard ecologist.

7.2.4.1 Manual, destructive and machine-assisted salvage

Systematic manual, destructive and/or machine-assisted searches will be undertaken during vegetation clearance and immediately following vegetation clearance. This approach will be used where deemed appropriate by the Project lizard ecologist and will include trees identified with high epiphyte loading when felled and within wood piles and existing sheds and other structures proposed for demolition.

The Project lizard ecologist will be present during the felling of any trees identified as having high epiphyte loading. When a 'High Risk' tree has been felled, and the supervisor of the vegetation clearance contractors has deemed it safe to approach the felled tree, the Project lizard ecologist will immediately commence searching the felled epiphytes for indigenous lizards. The tree may be cut into sections to facilitate safe searching and/or destructively searched (e.g., by manually dismantling epiphyte clumps). Where it is not safe to search a felled tree, the tree will instead be cut into sections that will be positioned and stored adjacent to suitable indigenous lizard habitat to maximise the likelihood that any indigenous lizards present will find their way back to habitat outside the Project area.

7.2.5 Protocol B: Capture, handling and release

The following steps will be undertaken by the Project lizard ecologist to ensure appropriate handling of indigenous lizards occur. Capture, handling and release of indigenous lizards will be undertaken in accordance with the below methodologies:

- All field equipment that indigenous lizards may come into contact with (e.g., plastic enclosures, collection bags, scales, etc.) will be sterilized, as well as hand sterilisation. All equipment used in their capture will subsequently be disinfected before reuse;
- Salvaged lizards will be either transported in individual cloth bags (only during salvage, not during holding or transportation) or in suitable ventilated plastic containers. Care will be taken so that the bags and containers will be kept at a constant ambient temperature;
- After salvage, indigenous lizards will be placed individually in ventilated (lid replaced with a mesh screen) 20 litre plastic containers with fresh vegetation and water. The containers will be kept at a constant ambient temperature in dappled light for no longer than 48 hours prior to being transported to the relocation site; and
- Salvaged indigenous lizards of threatened species will be released into the appropriately prepared relocation site (see 7.4.7 below), with the exception of copper skink which will be immediately released within suitable habitats that are not being disturbed alongside the alignment.
- Protocol C: Lizard injury or death

The following steps will be implemented if any injured or dead indigenous lizards are found during salvage:

- The Environmental Manager and relevant representatives of DOC, TRC and NPDC will be notified at the earliest opportunity within 24 hours after an injured or dead indigenous lizard found.
- Injured indigenous lizards found during salvage will be taken to a suitably qualified vet as soon as possible for assessment and treatment. Injured indigenous lizards will be kept in an appropriate portable enclosure (i.e., a clean, well-ventilated plastic container) under the direction of the Project lizard ecologist to ensure the animal is handled appropriately until the indigenous lizard(s) can be assessed and treated. The initial contact vet is:

  Dr Andrew Gore
  Hamilton Zoo
  Brymer Road
  Hamilton
  07 838 6720

  The initial vet contact may refer the indigenous lizard assessment and treatment to an alternative specialist if appropriate.
- An injured indigenous lizard may be euthanised immediately if it is deemed appropriate by the Project lizard ecologist that the injuries are not survivable, and that maintaining the indigenous lizard alive is highly likely to cause it inhumane levels of pain and stress. An appropriate euthanasia method will be selected by the Project lizard ecologist.
- Any indigenous lizard that is found dead or injured and subsequently euthanised will be returned to DOC as required by the Wildlife permit.
- Indigenous lizards assessed by the vet or alternative specialist as uninjured, or otherwise in suitable condition for release, will be transported to the release site in the portable enclosure and released into habitat suitable for the species being released.

7.2.6 Protocol D: Relocation site

All salvaged ~~lizards~~ striped skinks will be released at Rotokare Scenic Reserve, south Taranaki near Eltham, which is a ~~a~~ suitable relocation site. The exception is that copper skinks ~~(~~will be released in proximity to the Project area and all other species will be released into suitable habitat within the PMA (as assessment by the Project Herpetologist). The key aspects that make Rotokare Scenic Reserve an appropriate relocation site are:

- It contains suitable ~~indigenous lizard~~striped skink habitat (mature tawa, rewarewa and mahoe dominant forest);
- ~~It has existing populations of goldstripe gecko (*Woodworthia chrysosireticus*), forest gecko (*Mokopiriakau granulatus*), brown skink (*Oligosoma zelandicum*) and ornate skink (*Oligosoma ornatum*);~~
- It has an existing 8.2 km predator proof fence around its perimeter; and
- It has a regime of pest exclusion and control that is likely to continue indefinitely.

Any ~~arboreal geckos and~~ striped skinks relocated to Rotokare Scenic Reserve will be released under Close Cell Foam Covers (CCFC) allowing them to acclimatise after being transported reducing the risk of predation. The risk of predation, specifically from morepork, will further be minimised by selecting areas of dense sub-canopy away from forest edges as release sites.

- In the event that ~~green gecko~~striped skinks are salvaged and relocated a ~~roofed~~ soft release pen will be constructed ~~using temporary scaffolding with shade cloth exterior pinned around the perimeter~~following best practice methodology (Monks *et. al* 2017). The size of this soft release pen will be determined depending on the number of ~~geckos~~ skinks being released, the amount of suitable habitat available and the terrain which the soft release pen is proposed to be situated. The soft release pen will be dismantled approximately two months after the release of the last ~~green gecko~~striped skink. If necessary it will be reconstructed if more ~~green geckos~~striped skinks are found and relocated after this two month period.

7.3 Accidental discovery protocol

Hochstetter's frog (*Leiopelma aff. hochstetteri*) and Archey's frog (*Leiopelma archeyi*) have not been found within the Project footprint during surveys, which may be due to limited habitat availability. Although they are highly unlikely to be found within the Project footprint, their presence cannot be ruled out. If they are found then a Native Frog Management Plan will be developed in consultation with DOC, and will be implemented wherever appropriate across the Project footprint.

7.4 Monitoring

If >10 striped skinks are salvaged, then post-release monitoring will be initiated. Post release monitoring will, as a minimum, include establishing the home range of individual striped skinks (or a subsample if numbers are large) immediately post-release (probably using transmitters). Monitoring shall then be undertaken at years 1, 2 and 5 to determine whether the population has successfully established.

~~7.4~~7.5 Reporting and communication

The following data will be recorded for all lizards captured:

- Capture location and release location (GPS coordinates)
- Date and time of capture;
- Species;
- Capture methodology;
- A minimum of one photograph of the lizard including at least one photograph showing the dorsal surface clearly;
- Sex and age class;
- Weight;
- Snout to vent length (SVL);
- Health/condition;

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- Weather conditions at time of capture; and
- Habitat type at capture location.

Copies of all records will be submitted to DOC's national data repository for lizard records (the BioWeb Herpetofauna database) no later than the 20th day of the month following the month of capture. In addition, if lizards are found within the Project area, every six months from the commencement of vegetation clearance, the above data will be compiled, summarised and submitted to DOC, TRC and NPDC in a letter or memorandum which, as a minimum, will include the following information:

- DOC Wildlife Act authority number and Project name and location;
- A summary of the species, numbers and age/sex classes of lizards captured;
- Locations of lizards captured; and
- Summary of salvage methodologies, effort and success.

Six monthly reporting will cease once lizard salvage has been completed and all captured lizards have been released. A final report summarising the outcomes of LMP implementation will then be prepared and submitted to DOC, TRC, NPDC and iwi within three months following the final lizard release.

Monitoring reports will be submitted summarising results for post-release monitoring, and after the completion of years 1, 2 and 5 monitoring session. A final report summarising the outcomes of the striped skink salvage and release will then be prepared and submitted to DOC, TRC, NPDC and iwi within three months following the final monitoring.

~~7.5~~7.6 References

Anderson, P.; Bell, T.; Chapman, S. and Corbett, K. (2012). *SRARNZ New Zealand Lizards Conservation Toolkit – a resource for conservation management of the lizards of New Zealand*. A SRARNZ Miscellaneous Publication. Society for Research on Amphibians and Reptiles in New Zealand.Hitchmough, R.; Anderson, P.; Barr, B.; Monks, J.; Lettink, M.; Reardon, J.; Tocher, M.; Whitaker, T. (2013). Conservation status of New Zealand reptiles, 2012. *New Zealand Threat Classification Series 2*. Department of Conservation, Wellington.

Lettink, M. (2012). *Department of Conservation Inventory and Monitoring Toolbox: Herpetofauna*. Department of Conservation, Wellington.

Monks, J.; Knox, C.; Sidaway, K. 2017: Best practice techniques for the translocation of green geckos (*Naultinus* spp.). Department of Conservation, Wellington. 8 p. ttps://www.doc.govt.nz/globalassets/documents/getting-involved/translocation/best-practice-guidelines-for-green-gecko-translocation.pdf

Porter, R. (1987). An ecological comparison of two cyclodina skinks (Reptilia: Lacertilia) in Auckland, New Zealand. New Zealand Journal of Zoology 14 (4): 493-507.

Speedy, C., Day, T., & Innes, J. (2007). Pest eradication technology-the critical partner to pest exclusion technology: the Maungatautari experience. *Managing vertebrate invasive species*.

Towns, D. R., and Elliot, G. P. (1996). Effects of Habitat Structure on Distribution and Abundance of Lizards at Pukerua Bay, Wellington, New Zealand. New Zealand Journal of Ecology 20(2): 191–206.

Chapman, S. & Chroromanski, M. (2017). Assessment of Ecological Effects – Herpetofauna (Technical Report 7d, Volume 3 of the AEE),

Ecology New Zealand Ltd. (2018). Ecology supplementary report – Herpetofauna.