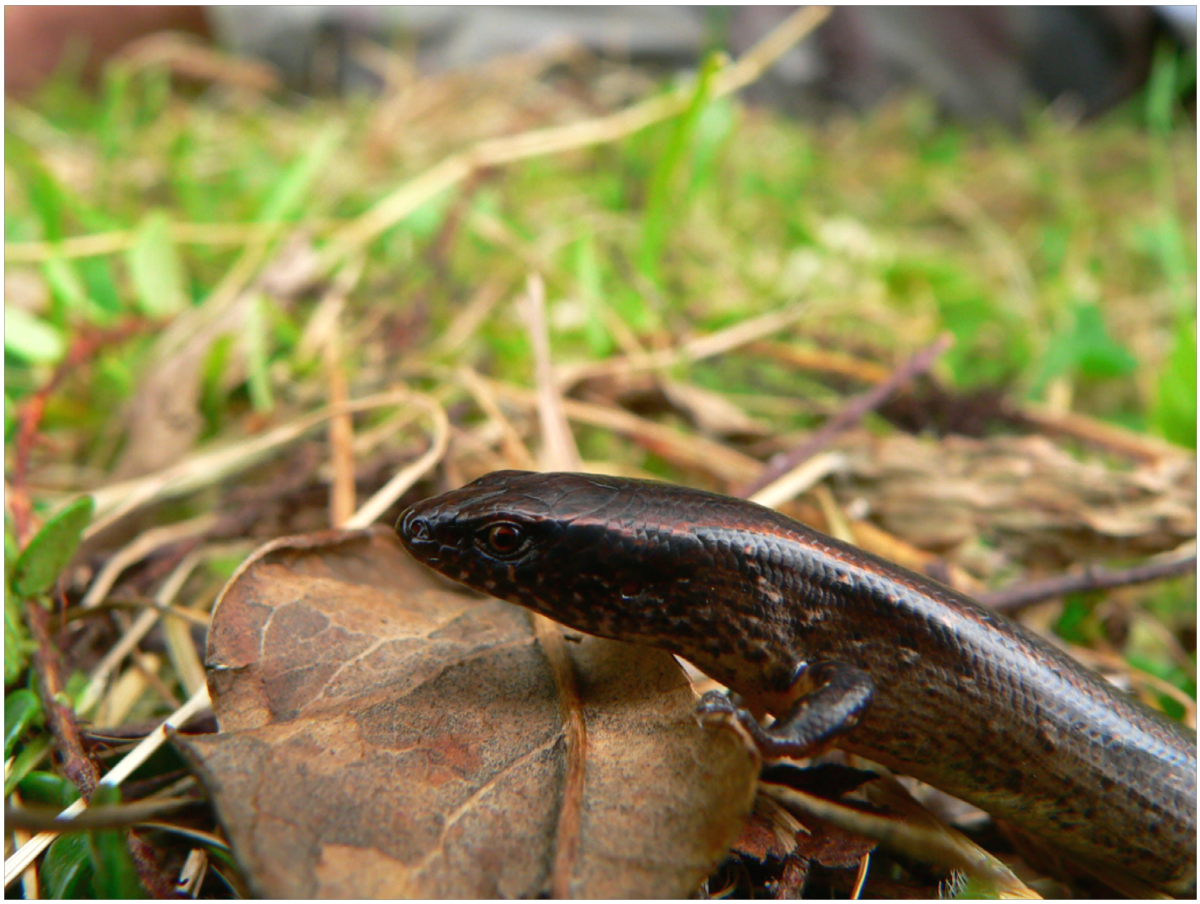
Assessment of Environmental Effects of tree removals on lizards at Ōhuiarangi/Pigeon Mountain



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Report information

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Contents

1. Introduction

This is a desktop assessment of environmental effects of tree removals on lizards at Ōhuiarangi / Pigeon Mountain.

In 2014, this maunga was returned to the Tāmaki Makaurau collective of mana whenua as part of a Treaty Settlement. This maunga is owned by the Taonga Trust and governed by the Tūpuna Maunga Authority.

In order to restore the historic defensive sightlines of the Tūpuna Maunga pā sites, restore cultural landscapes, and increase ecological values, exotic trees are being removed from the maunga. Exotic tree removal is prioritised for tihi (summit) areas. EcoGecko Consultants have been contracted to undertake this desktop assessment and evaluate lizard values on this maunga and the potential environmental effects of the tree removals and restoration activities on any lizards present.

In this report, we have made an assessment of the potential positive and negative effects of removing mature exotic trees that are over 3 m in height, the proposed pest management programme, and provide recommendations to avoid, remedy, and mitigate any potential adverse effects on native lizards.

2. Methodology

The Department of Conservation's BioWeb Herpetofauna Database and the Auckland Council Fauna Database were accessed by EcoGecko Consultants Ltd in July 2018 to retrieve lizard records within or in the immediate vicinity of the maunga. However, when using literature and databases to evaluate the potential presence of lizards at a specific location, it is important to remember that the records accessed do not capture the true extent of lizard distribution, nor do they indicate the full diversity of species that may be present. The database records are heavily reliant on lizard sightings being reported to the Department of Conservation and Auckland Council; records may be incomplete due to the lack of lizard sightings being reported.

During July 2018 a site assessment/visit was also undertaken to assess the lizard habitat values present on the maunga. **It is important to note that this visit was not a lizard survey.** A true assessment of the potential presence of native lizards at any location cannot be made in the absence of a field survey effort using suitable methodology and tools and undertaken by an experienced herpetologist holding an appropriate Department of Conservation Wildlife Act Authorisation.

Note: Within New Zealand, all native lizard species are afforded absolute protection under the Wildlife Act 1953, and it is an offence to disturb or kill native herpetofauna without permission from the

Department of Conservation. Any vegetation clearance potentially poses a threat to resident native lizard populations.

3. Proposed work process

The exotic tree species proposed for removal are large rooted or invasive. As there are archaeological values, tree removal from the maunga will primarily be undertaken by either helicopter or cranes (Figure 1).

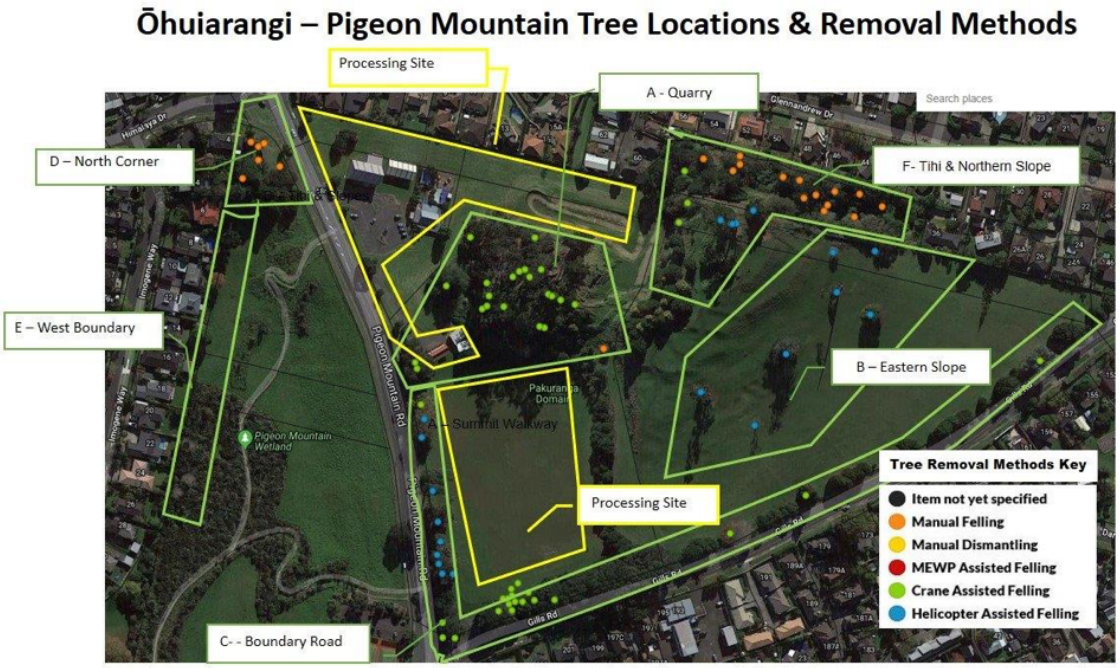

Figure 1. Proposed vegetation clearance methodologies for Ōhuiarangi / Pigeon Mountain.

4. Herpetological values of Ōhuiarangi / Pigeon Mountain

4.1. Lizard records

Neither the DOC database nor the Auckland Council database have any records for lizards on Ōhuiarangi / Pigeon Mountain or in the immediate vicinity.

[redacted]

No plague skinks (*Lampropholis delicata)* were recorded during the site assessment however it is most likely that they are present. This species is considered a pest species; it is classified as an "Unwanted Organism" by MPI Biosecurity, and "Introduced and Naturalised" by DOC's Threat Classification System.

4.2. Habitat values

[redacted]

Ōhuiarangi / Pigeon Mountain has both the attributes of mixed exotic-native tree pockets and exotic treeland, which have both have been deliberately planted. The treeland is represented as highly isolated trees in the landscape. The potential presence of arboreal geckos is considered highly unlikely.

[redacted]

5. Potential impacts of tree felling and planting on herpetological values

5.1. Positive effects

The habitat restoration programme in revegetating the tihi (pōhuehue; tātarāmoa, *Rubus cissoides*; rengarenga, *Arthropodium cirratum*; toetoe, *Austroderia fulvida*; wharariki, *Phormium cookianum* spp

hookeri; wharawhara, *Astelia banksii*) will increase the habitat values and complexity for native lizards. In addition to this, the establishment of a WF7 Puriri Ngahere (forest) will also enhance existing habitat values for lizards on site. For specific details on the restoration programme, see the Ōhuiarangi Mountain Planting Plan prepared by Te Ngahere (Mairs *et al.* 2018).

5.2. Negative effects

Tree felling by manual dismantling (i.e. tree removal not undertaken using helicopter or crane removal) may cause injuries or deaths to individual lizards in the drop zones.

5.3. Other

The potential presence of plague skink on the maunga, and any adverse effects due to the work programme is considered inconsequential. This is because the species is not protected by law and is also classified as an unwanted organism.

6. Recommended mitigation

The proposed felling methodology is likely to have very limited impacts on native skink populations. Much of the felling is proposed by helicopter or crane, with manual felling taking place only in locations where alternatives are not feasible. Measures could, however, be taken to strengthen extant populations on the site to allow them to better absorb any impacts from this project.

At present the best use of available resources would be to undertake pest control and habitat enhancement, specifically designed to support lizards. This use of resources would currently be preferred over putting efforts into lizard surveys, however, surveys may be considered further into the future, when lizards have had time to respond to pest control and habitat enhancement.

6.1. Habitat enhancement

Ecological restoration is planned for this maunga. The objective is to restore culturally appropriate plant species assemblages, enhance habitat values, and restore representative threatened and rare ecosystem types. These include WF7 pūriri broadleaf ecosystem type and lower growing native species (pōhuehue, *Muehlenbeckia complexa*; harakeke, *Phormium tenax*) depending on compatibility with archaeological values and maintenance of historic defensive sightlines.

Pōhuehue and harakeke are both highly valuable protective habitat for lizards. It is recommended that 50 plants each of pōhuehue and harakeke are established at this maunga.

6.2. Pest control

A key management tool to strengthen the viability of skink populations is predator control. Key predators are rats, (*Rattus rattus*, *R. norvegicus),* mice (*Mus muscula*), feral cats (*Felix catus*), hedgehogs (*Erinaceus europaeus*) and mustelids (*Mustelea* spp.: ferrets, stoats, weasels). Control of prey species, such as mice, to reduce the carrying capacity for higher predators is sometimes referred to as "bottom up" pest management.

A pest management plan should be prepared that includes control of rats, mice, and hedgehogs (assuming rabbits and mustelids are absent; if present, these two should be included). The plan should target high value skink habitat, mainly rock bomb with pōhuehue areas and kikuyu grasslands).

Notes:

- Rodent control to reduce numbers of ship rats (*Rattus rattus*) and Norway rats (*Rattus norvegicus*) could potentially cause increased mice (*Mus musculus*) numbers, as rats predate on, and compete with, mice for resources. This could have with unforeseen outcomes for indigenous fauna, such as lizards (Courchamp *et al.* 1999, Tompkins & Veltman 2006, Caut *et al* 2007, Goldwater *et al.* 2012, Norbury *et al.* 2013, Norbury 2017). Mice are a known lizard predator in New Zealand (Pickard 1984, Newman 1994, Wedding 2007, Norbury *et al.* 2014, Nelson *et al.* 2016). Being small, mice may access lizard retreats, and become a threat to lizards, particularly during the autumn and winter months when the weather is cooler and lizards are more susceptible to predation. Therefore, mice should be included in the pest management programme.

- The use of anticoagulant rodenticides (e.g. brodifacoum, bromadiolone, diphacinone) in bait stations is not expected to have a negative (lethal) impact on lizards (except for pindone), although research into sub-lethal effects is required (Weir *et al.* 2016). There is some evidence that lizards will ingest bait (Freeman *et al.* 1996, Hoare & Hare 2006, Marshall & Jewell 2007, Wedding *et al.* 2010), and there is also likely to be a secondary poisoning pathway through the consumption of affected invertebrate prey (Erickson & Urban 2004). However, to achieve acute toxicity (mortality) by pesticide would require consumption of a quantity of bait that a lizard is not likely able to accommodate in its stomach (Weir *et al.* 2016).

- The use of kill traps baited with peanut butter (or similar) is also not expected to have a major negative effect on lizards, although some larger lizards may occasionally set off traps, and be killed in the process.

- However, the number of lizards with sublethal effects from poisoning, or killed in predator traps is probably lower than the number killed by predatory pests themselves – in other words, the positive aspects of a pest control programme is likely to outweigh the potential risks of by-kill of lizards.

7. Recommendations for consent conditions

All arborist crew and machinery operators are aware of and fully comply with restrictions to work within clearly identified work zones only.

8. Conclusion

Ōhuiarangi / Pigeon Mountain has low to moderate lizard values, [redacted]

With the implementation of habitat restoration planting of skink habitat and a predator control programme, the tree removal of exotic trees over 3 m tall on the maunga is considered to have less than minor effects on the lizard fauna. The most direct impact will be injuries and deaths to individual terrestrial lizards that are within the drop zone, due to tree felling, and the use of heavy machinery, such as cranes, causing crush injuries and deaths if the machinery is allowed to move across rank kikuyu grassland habitats. Avoidance of rank grassland habitat is key to avoidance and minimisation of such adverse effects on the resident lizard fauna. Staging the tree works is unlikely to have any effects on the lizard values.

The pest control programme requires careful consideration on the strategy used to manage rats and mice on site, with recommendations for (a) continued/press suppression of rats, and (b) periodic/pulse suppression of mice during an optimal time period to be defined for maximum effectiveness (either summer or autumn).

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