

Conservation status of reptile species in the Wellington region



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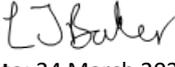
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Cover photo: Moko kākārīki, also known as barking gecko or Wellington green gecko. Credit: Joel Knight

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1. Introduction

This is the first reassessment of the conservation status of reptiles in the Wellington region. The work revises the original regional assessment published in 2020 (Crisp 2020), expanding the assessment to include all reptiles. This revision is based on the latest national assessment of reptiles published in 2021 which, in turn, revised previous national assessments published in 2002, 2007, 2013 and 2016 (Hitchmough et al. 2021). The aim of this report is to revise the conservation status of reptile species in the Wellington region in response to changes in their regional populations and national conservation status (Hitchmough et al. 2021).

The New Zealand Threat Classification System (NZTCS) assesses the threat status of New Zealand taxa at a national scale (Townsend et al. 2008). Threat rankings are used for prioritising conservation actions, research and monitoring, as well as natural resource management decisions. The Department of Conservation (DOC) is the lead agency tasked with managing indigenous species under the Wildlife Act 1953, however regional and district councils have a statutory obligation to manage species' habitats under the Resource Management Act 1991. An understanding of the presence of Threatened and At Risk species and their local conservation requirements is needed to meet that obligation.

2. Methodology

An expert panel comprised of Rod Hitchmough, Don Newman, Lynn Adams, Ox Lennon, Chris Woolley, Angus Hulme-Moir, Trent Bell, Sarah Herbert and Owen Spearpoint convened on 13 December 2022 to assess the status of reptile species in the Wellington region. Nicola Nelson provided input at a later stage. The national conservation status list served as a basis for the assessment (Hitchmough et al. 2021). A methodology to create regional threat lists had been developed by a collaborative group comprising representatives from DOC, regional councils and a local authority (see Crisp 2020). The resulting regional threat listing methodology leverages off the NZTCS but adjusts the species population threshold to the regional land area considered (in relation to the national land area) for species that are not Nationally Threatened. The assigned regional conservation status cannot be lower than that of the national conservation status, but can be higher, (eg, a Nationally Vulnerable species could be assessed as being Regionally Critical). The regional conservation assessment process also differs in that it includes the identification of regional populations that are national strongholds and the use of regional qualifiers, such as natural or historic range limits.

The expert panel reviewed the reptile species resident and non-resident in the Wellington region using the national reptile species list. The panel identified nationally extant species that had been extirpated in the Wellington region by comparing the national list to historic records for the region. The NZTCS criteria were applied to assign the regional conservation status to Nationally Threatened and At Risk regionally resident reptile species. The region was identified as a National Stronghold if the region had more than 20% of the national population of a species. For Nationally Not Threatened species, the regional population threshold was applied. In the Wellington region, the threshold has been set at less than 1,000 mature individuals present or a habitat occupancy area of less than 500ha. If the population is not stable or is increasing/decreasing by more than 10 percent, the NZTCS criteria is used to determine the regional conservation status. Qualifiers used included those listed in the NZTCS plus the natural and historic range limits.

The regional reptile conservation status was considered at two scales: on the mainland plus the sanctuaries (which include the islands) and on the mainland only within the region. Sanctuaries included: Mana, Kapiti, Matiu/Somes and Mākarō/Ward Islands, plus Zealandia Te Māra a Tāne.

3. Results

3.1 Conservation status listing

A total of 23 reptile species were identified as extant in the Wellington region. Taxa included 16 native lizards, 5 marine reptiles, 1 tuatara and 1 introduced lizard. Note that the conservation assessment includes species that are native and introduced to New Zealand, not just species native to the region. Two nationally extant native lizard species were listed as Regionally Extirpated.

The previous regional conservation assessment (Crisp 2020) was limited to lizards. It assessed 17 lizard species (and tuatara, but not other reptiles). This report reassesses these species, includes the introduced plague skink (*Lampropholis delicata*) and considers the taxonomic revision of Duvaucel's gecko that was subsequently split into two species: northern Duvaucel's gecko (*Hoplodactylus duvaucelli*) and Te Mokomoko a Tohu/Tohu gecko (*Hoplodactylus tohu*), (Scarsbrook et al. 2023). Two other name changes have occurred since the 2020 regional report. The type specimen of speckled skink (*Oligosoma infrapunctatum*) is now considered to be a different taxon of unknown provenance. This means that populations that were previously referred to as *Oligosoma infrapunctatum* are now named Newman's speckled skink (*Oligosoma newmanii*), (Melzer et al. 2019). *Oligosoma lineocellatum* (northern spotted skink) has been renamed *Oligosoma kokowai* (Melzer et al. 2017).

The non-lizard species present in the region are tuatara and vagrant marine reptiles. Tuatara have been designated in this assessment as Regionally Reintroduced because they are believed to have been extirpated in the region and have been returned through three reintroductions, but these populations have yet to be shown to be self-sustaining. A reintroduced population is deemed to be self-sustaining when it is expanding or in a stable state through natural replenishment and at least half of the breeding adults are products of natural replenishment; and it has been at least 10 years since reintroduction (Rolfe et al 2021). In the Wellington region, founder tuatara were reintroduced to Matiu/Somes Island in 1998 and to Zealandia Te Māra a Tāne in 2005 and 2007 using different stock sources. While it is unlikely that the populations have become self-sustaining yet, they are all on track towards that status with high survival and health of founders and evidence of recruitment.

Following the previous regional conservation assessment, it was identified that it would be useful to distinguish between the presence of taxa on the mainland or in sanctuaries. This split into mainland versus mainland plus sanctuaries made a difference to the mainland conservation status of the Regionally Threatened taxa, but not the Regionally At Risk or Regionally Not Threatened taxa.

The conservation status of 22 of the 23 reptile taxa is listed in Appendix A; Table A1. Plague skink has not been included as the arrivals in the region so far have been individuals and are not known to be breeding. The regional status is based

on the status of taxa across the mainland and sanctuaries. Two reptile taxa were assessed as being Regionally Extirpated and one lizard species identified as Regionally Data Deficient. There was uncertainty as to whether historic records of this latter species – Pacific gecko (*Dactylocnemis pacificus*) – were natural, established from accidental transport, or escapes from collections, but two specimens were found in the Upper Hutt area. Three reptile species were identified as Regionally Threatened: two Critical and one Vulnerable. Of those species, two were Nationally Threatened and one was Nationally At Risk. Nine species were identified as being Regionally At Risk: six Regionally Declining, two Regionally Recovering and one Regionally Reintroduced, while two species were listed as being Regionally Not Threatened.

If the conservation status of reptile species is considered on the Wellington mainland only however, there are more species in the Extirpated and Threatened categories on the mainland (Figure 3.1).

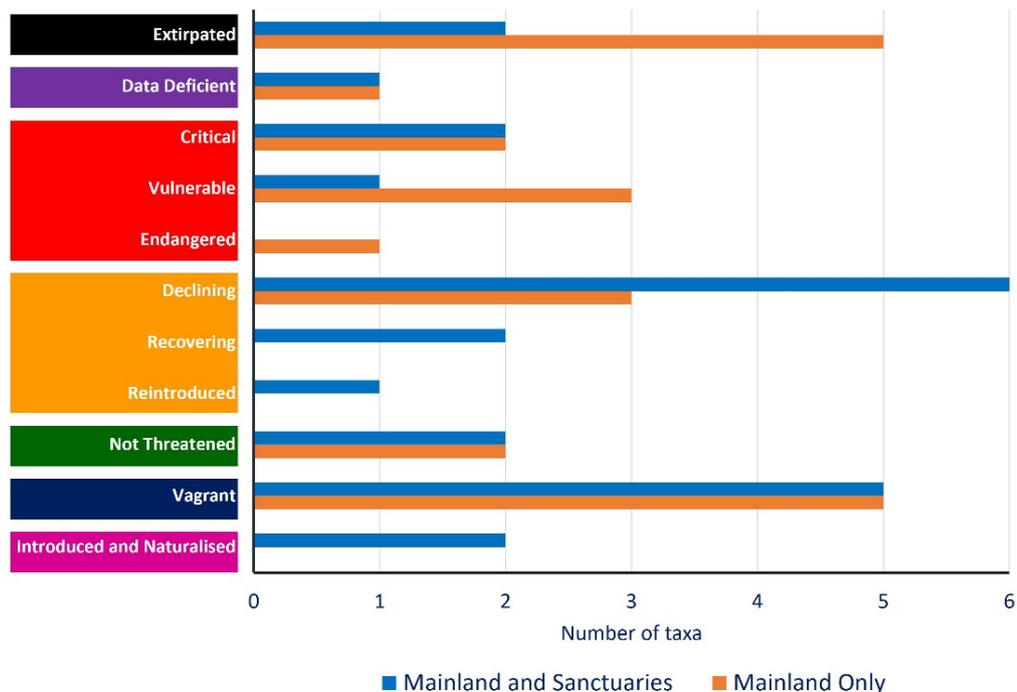


Figure 3.1: Conservation status of reptile species in the Wellington mainland and sanctuaries versus mainland only

Three species in the sanctuaries (both Nationally and Regionally At Risk), have been extirpated from the mainland. This includes tuatara, a species which is no longer present in the wild on the Wellington mainland but has been designated as Reintroduced in the Regionally At Risk category. Three species had a higher threat status on the mainland than when the status was considered including sanctuaries. At the time of this assessment:

- Northern spotted skink (*Oligosoma kokowai*) was thriving on Matiu/Somes and Mākaro/Ward Islands (Regionally Recovering) but was in serious trouble on the mainland (Endangered).

- Copper skink (*Oligosoma aeneum*) was common on the islands (Regionally Declining), but populations were considered to have a high rate of decline on the mainland (Vulnerable). Note that though the island populations are thought to be stable, the regional status cannot be lower than the national status (Nationally Declining).
- Ornate skink (*Oligosoma ornatum*) populations (Regionally Declining) were thought to suffer from mouse irruptions in areas outside of the mouse-free sanctuaries (Vulnerable).

Two Introduced and Naturalised species were released on Mana Island outside of their historic range, while one sea krait and four turtle taxa were assessed as non-resident vagrants that visit the Wellington waters. Regional conservation assessment notes are shown in Appendix A; Table A2.

Wellington is a national stronghold for three gecko and one skink species on the mainland: moko kākārīki/barking gecko (*Naultinus punctatus*), ngahere gecko (*Mokopirirakau* “southern North Island”), Raukawa gecko (*Woodworthia maculata*) and glossy brown skink (*Oligosoma zelandicum*). The region is also a national stronghold for two lizard species that have been extirpated from the mainland but are present in sanctuaries: McGregor’s skink (*Oligosoma macgregori*) on Mana Island and moko mangaeka/goldstripe gecko (*Woodworthia chrysosirectica*) on Mana and Kapiti Islands.

3.2 Regional trends

It is difficult to compare the conservation status between the regional threat listing reports because no differentiation was made between mainland and mainland plus sanctuary populations in the initial regional listing. The change to the conservation status of four species can however be reported:

- Minimac gecko (*Woodworthia* “Marlborough mini”) was moved from being Regionally Naturally Uncommon to Regionally Declining. No recent surveys had been completed in the region, but it was noted that there had been a national decline in populations of this species at sites that had been visited over long periods of time (Hitchmough et al. 2021).
- The status of copper skink (*Oligosoma aeneum*) had improved from Regionally Critical to Regionally Vulnerable. This was due to a higher rate of decline assessment being made in the previous regional report (>70%), as there were major concerns about the population crash at Pukerua Bay. However, this rapid decline has slowed. The rate of decline was lowered to the 50-70% range in this assessment, but it should be noted that the conservation status for the species had worsened in the last national review.
- On the islands, the status of McGregor’s skink (*Oligosoma macgregori*) improved from Regionally Vulnerable to Regionally Recovering.
- Moko mangaeka/goldstripe gecko (*Woodworthia chrysosirectica*) has moved from Regionally Recovering to Regionally Declining in line with the national status change (Hitchmough et al. 2021).

3.3 Distribution information

Seven of the twelve reptile species on the mainland in the Wellington region have been recorded in or have potential habitat located in all nine territorial authority areas within the region (Appendix B; Table B1). Minimac gecko was confined to the coastal area of the Wellington district, while Whitaker's skink (*Oligosoma whitakeri*) was only located in the Porirua district and the last-known records of Kupe skink were recorded in the Masterton and Carterton districts. The Wellington region populations are equally likely to be Hawke's Bay skink (*Oligosoma auroraense*), rather than the Kupe skink (*Oligosoma aff. infrapunctatum* "southern North Island"), but this needs confirmation. Glossy brown skink was previously thought to occur only on the western side of the axial ranges, but recent records of the species were made in the southern Wairarapa and as far east as Hawke's Bay (outside the region).

Records in the DOC Bioweb Herpetofauna database and on iNaturalist provided some information about the distribution of reptile species in the region, but data collation was a challenge. References to a number of surveys that have been completed in the region are noted in the regional conservation assessment notes (Appendix A, Table A2). A summary of lizard species present in the Greater Wellington Regional Council Key Native Ecosystem sites has been provided in Romijn 2021, while other contemporary reports cover surveys conducted at: Rewanui Reserve (Fea 2021), Stoney Creek forestry (Bell 2019b) and Sustainable Wairarapa surveys at Castlepoint, Ocean Beach and Whangaimoana Beach (Thorp et al. 2021 a,b).

3.4 Recommendations for conservation actions

A summary of management and survey priorities for regional lizard species is detailed in Appendix C; Table C1. The highest priority identified was to complete a follow-up survey of the area in the Tararua Forest Park where a recent photograph indicated the presence of a species of speckled skink (possibly Kupe skink). A close second on the priority list was to survey Carter's Scenic Reserve in Carterton which was also highlighted as a possible site for this species. The completion of coastal surveys for species such as northern spotted skink and copper skink, particularly in the Wairarapa would improve current knowledge of the status and trend of populations of these species. Coastal surveys in the west of the region were also recommended for glossy brown skink. Re-surveying the minimac gecko population on the southern Wellington coast was given a lower priority, but it should be noted that it has been over 20 years since the last survey was completed and an appraisal of the current population levels in the area would be useful given the national concern that this range-restricted species is in decline.

Finding appropriate managed sites for many of the mainland lizard species was recommended. The Romijn et al (2012) report, written on behalf of the Wellington Regional Lizard Network, recommended that there should be active management at a minimum of three mainland sites for each lizard species to secure their persistence in the region. Pest control activities within Wellington

City (particularly on Miramar Peninsula at present and in the future proposed intensive pest control extensions) should aid the recovery of some of the lizard species in the region. There are sites in other parts of the region that are currently in need of assistance to sustain pest control however (eg, Ponatahi Lizard Sanctuary) and most pest control projects within the region do not aim to suppress mice, a pest animal that has serious impacts on lizard survival (Norbury et al. 2014).

4. Discussion

Twelve of the indigenous reptile species known to be naturally present in the Wellington region were considered to be extant on the mainland. Of those species, it is uncertain whether Pacific gecko naturally occurred in the region and Whitaker's skink was thought to be possibly extirpated in the wild. This leaves ten indigenous species, over half of which are regarded as Threatened on the mainland. The chief cause of the population declines in these species was identified as introduced predators, though habitat loss was also raised as a concern. The population sizes of many of the Regionally Threatened and At Risk reptile species are large when compared to those of threatened birds or vascular plants, but it is the rate of decline on the mainland that is the main driver of the conservation status. Copper skinks were once commonly reported in gardens (Bell et al. 2018) but those observations are not being made now. Concomitantly, re-surveys at previously known sites, such as Turakirae Head and Pukerua Bay have resulted in low or zero detections for copper, northern spotted, and Whitaker's skinks (Herbert 2020).

Predator control (of cats, hedgehogs, mustelids, rats and mice) is key to maintaining populations of Threatened and At Risk reptile species on the mainland. The enforcement of regulatory requirements to protect lizards and their habitats during consenting processes for developments is also important. Plague skinks are a threat to native lizards. To date the arrivals have been single individuals and are low risk as they are unlikely to breed but this could quickly change if a number of individuals were simultaneously introduced to a suitable location. At least two observations of the species have been made in the region in 2022 in the iNaturalist "research grade" records, but more have been reported to DOC and the Ministry for Primary Industries (MPI). There are a few sites in the region where intensive mouse control is being used to aid the recovery of lizard populations outside of sanctuaries (Baring Head, Paekakariki Escarpment and Whitieria Park), though controlling mice is challenging. More lizard sanctuaries would assist the region's native lizards. A lizard survey on farmland in the eastern Wairarapa found that habitat destruction and predation by mustelids and rats had already significantly reduced the lizard fauna, with the remaining lizard populations now likely to be being suppressed by mice, despite conventional pest management (of mustelids, possums and rats) in the landscape (Bell et al. 2020). The density to which mice need to be reduced has been investigated at a mainland site in the South Island (Norbury et al. 2022), but such information is only recently becoming available and is limited to a few species in a few locations.

Lizards are difficult to detect and search efforts across the region have been hampered by a lack of available qualified experts. Lizard sightings recorded in the past have been linked to habitats where people encounter them (ie, the cities and towns as can be seen in Figure 4.1), favoured survey sites (eg, Pukerua Bay and Turakirae Head) or across particular reserves (eg, Wellington City surveys), (Melzer and Bell 2014). To encourage more widespread surveys the Wellington Regional Lizard Network applied for a blanket collecting permit. A

permit was granted by DOC on the basis of a three-level system, similar to the bird banding scheme, to ensure that all work is undertaken by suitably skilled people while making it possible to develop new lizard handlers. It is hoped that this will enable more surveys to occur and to improve knowledge of lizard populations in the region.

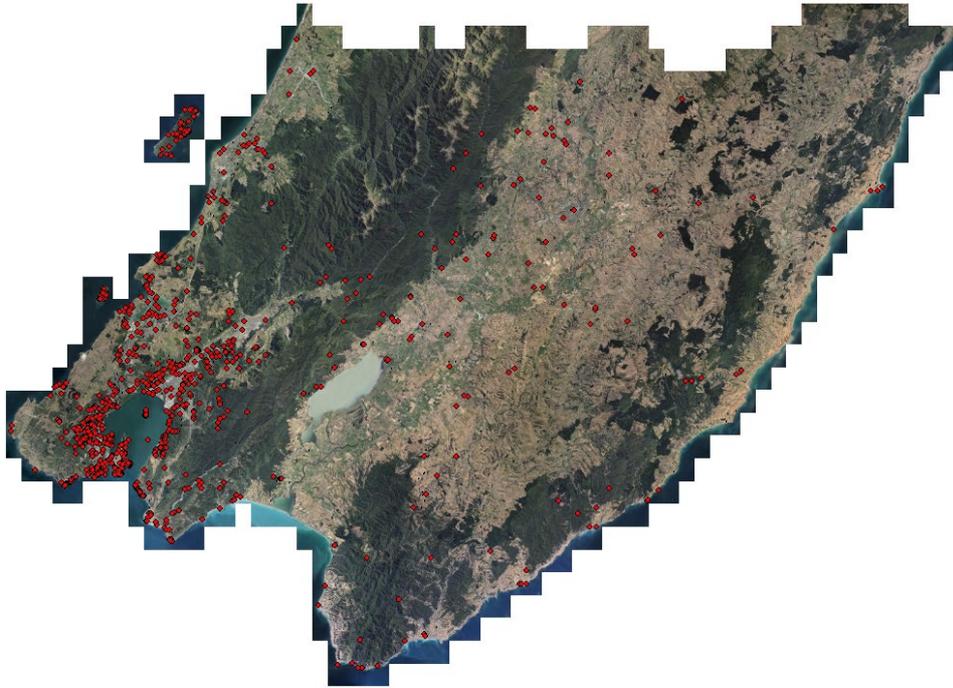


Figure 4.1: Distribution of lizard records captured in the DOC Bioweb Herpetofauna for the Wellington region (November 2020) since the 1950s

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References

Bell BD, Hare KM and Pledger SA. 2018. Lizards in the suburbs: a single-garden study of a small endemic New Zealand skink (*Oligosoma aeneum*). *New Zealand Journal of Zoology* 45(4): 341-358.

Bell T. 2018a. *Fensham Reserve / Cobden Road: 2017 - 2018 lizard survey results and recommendations*. Technical report prepared for the Greater Wellington Regional Council by EcoGecko Consultants Limited, July 2018. 12p.

Bell T. 2018b. *Lowe's Bush Scenic Reserve: 2017 - 2018 lizard survey results and recommendations*. Technical report prepared for the Greater Wellington Regional Council by EcoGecko Consultants Limited, July 2018. 12p.

Bell TP. 2019a. *Wellington City Council lizard surveys: 2016-2018*. Technical report prepared for Wellington City Council by EcoGecko Consultants Limited, February 2019. 41p.

Bell T. 2019b. Lizard survey report: Stoney Creek forestry plantations, Wairarapa.

Bell T and Goldwater N. 2020. *Northern spotted skink population monitoring at Baring Head/Orua-Pouanui, East Harbour Regional Park, Wellington*. Wildland Consultants Ltd Contract Report 5584 for Greater Wellington Regional Council.

Bell TP and Herbert SM. 2017. Establishment of a self-sustaining population of a long-lived, slow-breeding gecko species (Diplodactylidae: *Hoplodactylus duvaucelii*) evident 15 years after translocation. *Journal of Herpetology* 51:37-46.

Bell T, Thorp C and Papworth N. 2020. *Lizard survey of Danaloo and Waimana farms, Wairarapa*. Wildland Consultants Ltd Contract Report No. 5241 for Greater Wellington Regional Council.

Callister P. 2017. Restoring the Paekakariki-Pukerua Bay escarpment quarry site. Nga Uruora-Kāpiti Project (Inc) website [Restoring the Paekākāriki-Pukerua Bay escarpment quarry site – Ngā Uruora – Kāpiti Project \(Inc\) \(Kāpitibush.org.nz\)](http://www.kapitibush.org.nz)

Crisp P. 2020. *Conservation status of lizard species in the Wellington region*. Greater Wellington Regional Council, Publication No. WRC/ESCI-G-20/2, Wellington.

Fea N. 2021. *Bird abundance, weta and lizards in Rewanui Forest Park 2019-2021*. Client report prepared for Greater Wellington Regional Council. Chris Brausch Bushwork Contracting, Thames.

Gollan JF. 2016. *Quantifying the benefits of rat eradication to lizard populations on Kāpiti Island*. Master of Science thesis, Massey University, Palmerston North, NZ.

Herbert SM. 2020. *Is habitat enhancement a viable strategy for conserving New Zealand's endemic lizards?* Doctorate thesis, Victoria University, Wellington, New Zealand.

Hitchmough RA, Barr B, Knox C, Lettink M, Monks JM, Patterson GB, Reardon JT, van Winkel D, Rolfe J and Michel P. 2021. *New Zealand Threat Classification Series 35. Conservation status of New Zealand reptiles, 2021.* Department of Conservation, Wellington.

Hoare JM, Adams LK, Bull LS and Towns DR. 2007. Attempting to manage complex predator-prey interactions fails to avert imminent extinction of a threatened New Zealand skink population. *Journal of Wildlife Management* 71(5): 1576-1584.

Innes R, Herbert S and Bell T. 2014. *Lizard survey of Whitireia Park.* Report prepared for the Whitireia Restoration Group. EcoGecko Consultants Ltd, Wellington.

KERP 2018. Amended lizard monitoring report, Kiernan property 2018 (under Wildlife Act Authority Authorisation Number: 50664-FAU).

Melzer S and Bell T. 2014. *Lizard survey of Wellington City Council-administered Parks & Reserves: final report.* Report prepared for the Wellington City Council. Technical report, EcoGecko Consultants Limited. 115 p.

[Melzer S, Bell T and Patterson GB. 2017. Hidden conservation vulnerability within a cryptic species complex: taxonomic revision of the spotted skink \(*Oligosoma lineocellatum*; Reptilia: Scincidae\) from New Zealand. *Zootaxa*, 4300\(3\), 355-379.](#)

Melzer S, Hitchmough RA, Bell T, Chapple DG and Patterson GB. 2019. Lost and Found: Taxonomic revision of the speckled skink (*Oligosoma infrapunctatum*; Reptilia; Scincidae) species complex from New Zealand reveals a potential cryptic extinction, resurrection of two species, and description of three new species. *Zootaxa* 4623(3): 441–484.

NZHS website 2023. New Zealand Herpetological Society website.
<https://www.reptiles.org.nz/>

Norbury G, van den Munckhof M, Neitzel S, Hutcheon A, Readon J and Ludwig K. 2014. Impacts of invasive house mice on post-release survival of translocated lizards. *New Zealand Journal of Ecology* 38(2): 322-327.

Norbury G, Wilson DJ, Clarke D and Smith H. 2022. Density-impact functions for invasive house mouse (*Mus musculus*) effects on indigenous lizards and invertebrates. *Biological Invasions* 2022.

Rolfe J, Makan T and Tait A. 2021. *Supplement to the New Zealand Threat Classification System manual 2008: new qualifiers and amendments to qualifier definitions, 2021.* Department of Conservation, Wellington. 7p.

- Romijn R. 2010. *Lizard fauna of Wellington's regional parks*. Unpublished report, Greater Wellington Regional Council.
- Romijn R. 2021. *Lizards in the Key Native Ecosystem Programme*. Unpublished report, Greater Wellington Regional Council.
- Romijn R and Masters R. 2020. *Cape Palliser – Te Matakiatake a Kupe KNE site lizard survey*. Unpublished report, Greater Wellington Regional Council.
- Romijn R, Adams L and Hitchmough R. 2012. Lizard strategy for the Wellington region 2012 -20. Wellington Regional Lizard Network.
- Scarsbrook L, Sherratt E, Hitchmough RA and Rawlence NJ. 2021. Skeletal variation in extant species enables systematic identification of New Zealand's large, subfossil diplodactylids. *BMC Ecological Evolution* 21:67.
- Scarsbrook L, Walton K, Rawlence NJ and Hitchmough RA. 2023. Revision of the New Zealand gecko genus *Hoplodactylus*, with the description of a new species. *Zootaxa* 5228(3): 267-291.
- Thorp C, Bell T and Burn-Murdoch D. 2021a. *Lizard survey of Ocean Beach/Onoke Spit and Whangaimoana Beach, Wairarapa*. Contract Report No. 5481 prepared for Sustainable Wairarapa/Friends of Onoke Spit. Wildland Consultants Ltd.
- Thorp C, Bell T and Burn-Murdoch D. 2021b. *Lizard survey of Rangiwahakaoma-Castlepoint Scenic Reserve, Wairarapa*. Contract Report No. 5480 prepared for Sustainable Wairarapa. Wildland Consultants Ltd.
- Townsend AJ, de Lange PJ, Duffey CAJ, Miskelly CM, Molloy J and Norton DA. 2008. *New Zealand threat classification system manual*. Department of Conservation Wellington, New Zealand 35p.
- Worthy T. 1987. Osteological observations of the larger species of skink *Cyclodina* and subfossil occurrence of these and the gecko *Hoplodactylus duvaucelli* in the North Island, New Zealand. *New Zealand Journal of Zoology* 14; 219-229.

Appendix A

Table A1: Conservation status of reptile species in the Wellington region

Common Name	Name and Authority	Regional Conservation Status*	Conservation Status Wellington Mainland	National Conservation Status	Regional Criteria	National Stronghold	Regional Population Area	Population Area Wellington Mainland	Regional Trend	Trend Wellington Mainland	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers
REGIONALLY EXTINCT (2)													
Duvaucel's gecko	<i>Hoplodactylus duvaucelii</i> Duméril & Bibron, 1836	Extirpated	Extirpated	Relict	N/A	—	—	—	—	—	Quantitative	—	HR
Robust skink	<i>Oligosoma alani</i> Robb, 1970	Extirpated	Extirpated	Recovering	N/A	—	—	—	—	—	Quantitative	—	HR
DATA DEFICIENT (1)													
Pacific gecko	<i>Dactylocnemis pacificus</i> Gray, 1842	Data Deficient	Data Deficient	Not Threatened	N/A	No	N/A	N/A	—	—	—	—	DD
REGIONALLY THREATENED (3)													
Regionally Critical (2)													
Whitaker's skink	<i>Oligosoma whitakeri</i> Hardy, 1977	Critical	Critical	Endangered	A (1)	No	N/A	<250 <1ha	N/A	>70% decline	Quantitative	Quantitative	CD, OL, TL, NR, HR
Kupe skink	<i>Oligosoma aff. infrapunctatum</i> "southern North Island"	Critical	Critical	Critical	A (1)	No	N/A	<250	N/A	—	Quantitative	—	DP, NR, HR
Regionally Vulnerable (1)													
Moko kākārīki/barking gecko	<i>Naultinus punctatus</i> Gray, 1842	Vulnerable	Vulnerable	Declining	D (1/1)	Yes	5,000-20,000	5,000-20,000	50-70% decline	50-70% decline	Qualitative	Qualitative	DP, NR, HR, NS, PF
REGIONALLY AT RISK (9)													
Regionally Declining (6)													
Copper skink	<i>Oligosoma aeneum</i> Girard, 1857	Declining	Vulnerable	Declining	C	No	>20,000	>20,000	Stable	50-70% decline	Quantitative	Expert opinion	PD, NR, HR, CD, PF
Ornate skink	<i>Oligosoma ornatum</i> Gray, 1843	Declining	Vulnerable	Declining	B (1/1)	No	20,000-100,000	20,000-100,000	10-50% decline	50-70% decline	Qualitative	Expert opinion	CD, DP, PD, NR, HR, RR
Glossy brown skink	<i>Oligosoma zelandicum</i> Gray, 1843	Declining	Declining	Declining	B (1/1)	Yes	20,000-100,000	20,000-100,000	10-30% decline	10-30% decline	Qualitative	Expert opinion	CD, DPR, PD, RR, NR, HR, NS
Ngahere gecko	<i>Mokopirirakau</i> "southern North Island"	Declining	Declining	Declining	B (1/1)	Yes	20,000-100,000	20,000-100,000	10-30% decline	10-30% decline	Qualitative	Qualitative	CD, DP, PD, NR, HR, NS, PF

Common Name	Name and Authority	Regional Conservation Status*	Conservation Status Wellington Mainland	National Conservation Status	Regional Criteria	National Stronghold	Regional Population Area	Population Area Wellington Mainland	Regional Trend	Trend Wellington Mainland	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers
Minimac gecko	<i>Woodworthia</i> "Marlborough mini"	Declining	Declining	Declining	C(1)	No	<1,000 ha	<1,000 ha	±10% stable	±10% stable	Quantitative	Expert opinion	DP, HR, NR, RR
Moko mangaeka/goldstripe gecko	<i>Woodworthia chrysosiretica</i> Robb, 1980	Declining	Extirpated	Declining	A	Yes	1,000-5,000	N/A	>10% increase	N/A	Expert opinion	Quantitative	CD, DP, Inc, RR, NR, HR, NS
Regionally Recovering (2)													
Northern spotted skink	<i>Oligosoma kokowai</i> Melzer et al 2017	Recovering	Endangered	Relict	A	No	>100,000ha <100ha	1,000-5,000 <100ha	>10% increase	50-70% decline	Quantitative	Quantitative	CD, DP, PD
McGregor's skink	<i>Oligosoma macgregori</i> Robb, 1975	Recovering	Extirpated	Recovering	A (3/1)	Yes	20,000-100,000	N/A	>10% increase	N/A	Quantitative	Quantitative	CD, OL, NR, HR, NS
Regionally Reintroduced (1)													
Tuatara	<i>Sphenodon punctatus</i> Gray, 1842	Reintroduced	Extinct	Relict	B	No	250-1000 <1,000ha	N/A	>10% increase	N/A	Quantitative	Quantitative	CD, Inc, RR, RN, De
REGIONALLY NOT THREATENED (2)													
Northern grass skink	<i>Oligosoma polychroma</i> Patterson & Daugherty, 1990	Not Threatened	Not Threatened	Not Threatened	N/A	No	>100,000	>100,000	±10% stable	±10% stable	Quantitative	Quantitative	
Moko pāpā/Raukawa gecko	<i>Woodworthia maculata</i> Gray, 1845	Not Threatened	Not Threatened	Not Threatened	N/A	Yes	>100,000	>100,000	±10% stable	±10% stable	Quantitative	Expert opinion	CD, NS
REGIONALLY NON-RESIDENT NATIVE (5)													
Vagrant (5)													
Yellow-lipped sea krait	<i>Laticauda colubrina</i> Schneider 1799	Vagrant	Vagrant	Not Threatened	N/A	No	N/A	N/A	—	—	—	—	DPS, DPT, SO
Green turtle	<i>Chelonia mydas</i> Linnaeus 1758	Vagrant	Vagrant	Migrant	N/A	No	N/A	N/A	—	—	—	—	TO
Leatherback turtle	<i>Dermochelys coriacea</i> Vandelli 1761	Vagrant	Vagrant	Migrant	N/A	No	N/A	N/A	—	—	—	—	TO
Loggerhead turtle	<i>Caretta caretta</i> Linnaeus 1758	Vagrant	Vagrant	Vagrant	N/A	No	N/A	N/A	—	—	—	—	DPS, DPT, TO

Common Name	Name and Authority	Regional Conservation Status*	Conservation Status Wellington Mainland	National Conservation Status	Regional Criteria	National Stronghold	Regional Population Area	Population Area Wellington Mainland	Regional Trend	Trend Wellington Mainland	Regional Confidence Population	Regional Confidence Trend	Regional Qualifiers
Hawksbill turtle	<i>Eretmochelys imbricata</i> Linnaeus 1766	Vagrant	Vagrant	Vagrant	N/A	No	N/A	N/A	—	—	—	—	DPS, DPT, TO
INTRODUCED AND NATURALISED (2)													
Te Mokomoko a Tohu/Tohu gecko	<i>Hoplodactylus tohu</i> n.sp.	Introduced and Naturalised	N/A	Increasing	A (1)	No	N/A	<250	N/A	>10% increase	Quantitative	Quantitative	CD, OL, IN
Newman's speckled skink	<i>Oligosoma newmani</i> Wells & Wellington 1985	Introduced and Naturalised	N/A	Declining	A (1)	No	N/A	<250	N/A	±10% stable	Quantitative	Qualitative	CD, DP, OL, IN

* Regional Conservation Status is based on an assessment of the population and trend of reptile species in the sanctuaries and on the mainland

Regional and National Qualifiers:

CD	Conservation Dependent	DD	Data Deficient	De	Designated
DP	Data Poor	DPR	Data Poor: Recognition	DPS	Data Poor: Size
DPT	Data Poor: Trend	HR	Historic Range	IN	Introduced Native
Inc	Increasing	NR	Natural Range	NS	National Stronghold
OL	One Location	PD	Partial Decline	PF	Population Fragmentation
RN	Restored Native	RR	Range Restricted	TL	Type Locality
SO	Secure Overseas	TO	Threatened Overseas		

Table A2: Regional conservation assessment notes for reptiles in the Wellington region

Common Name	Name and Authority	Mainland only	Island/sanctuaries
Duvaucel's gecko	<i>Hoplodactylus duvaucelii</i> Duméril & Bibron, 1836	Extirpated from mainland. Subfossils found at Mataikona dunes and Aorangi caves (Scarsbrook et al. 2021, Worthy 1987)	Not on islands or in sanctuaries in the region.
Robust skink	<i>Oligosoma alani</i> Robb, 1970	Extirpated from mainland. Subfossils found in Aorangi caves (Worthy 1987)	Not on islands or in sanctuaries in the region.
Pacific gecko	<i>Dactylocnemis pacificus</i> Gray, 1842	Uncertainty as to whether historic records are natural or escapes from collections. Region would be southernmost range limit if natural presence confirmed. Two specimens from Blue Mountains area.	Not on islands or in sanctuaries in the region.
Whittaker's skink	<i>Oligosoma whittakeri</i> Hardy, 1977	Fewer than 10 wild individuals, possibly regionally extinct in the wild as of 2010. Last seen 12 years ago. Not seen in 2022 survey. Pukerua Bay only NZ mainland population recorded in region.	Not on offshore islands. Captive breeding potential for future restoration. Fifteen animals taken from Pukerua Bay into captivity appeared to include two groups of very closely related individuals.
Kupe skink	<i>Oligosoma aff. infrapunctatum</i> "southern North Island"	Not observed since 1970s near Carterton and north of Masterton by Bruce Thomas and Tony Whittaker. Confirmed sighting with photo in Tararuas. Surveyed Fensham, Lowe's Bush and Mikimiki without any animals found (Bell 2018a and b). Carter's Reserve may hold population. Species split into eastern and western - unsure which species is present in the region. Confirmed recent sighting with photo in the Tararuas.	Not on offshore islands or in sanctuaries in the region.

Common Name	Name and Authority	Mainland only	Island/sanctuaries
Moko kākārīki/ barking gecko	<i>Naultinus punctatus</i> Gray, 1842	No longer recorded from many sites known in 1970s but sporadic widespread records. Similar but more sparse distribution than forest gecko. Good numbers being found in Wellington reserves from Tawa north, at Korokoro and Wainuiomata (Romijn 2021).	Possibly recovering on Kāpiti Island. Reintroductions on Mana and Matiu/Somes Islands, likely still present but in low numbers.
Copper skink	<i>Oligosoma aeneum</i> Girard, 1857	Still widespread though sparsely distributed on mainland. Low number of recent records suggests significant decline in recent decades. Well documented crash at Pukerua Bay over 35 years (Hoare et al. 2007). Sporadic records at coastal and inland sites. Assessment based on Pukerua Bay data and anecdotal evidence. Stable or declining at Whitireia (Innes et al. 2014). Recorded from Baring Head, but sparse. Present in Fensham, Wellington and Kapiti forests. None recently recorded from Turakirae Head, but small increase on Miramar Peninsula escarpment above dog pound before pest eradication (Herbert 2020).	Secure though not abundant on Mana, Kāpiti, Matiu/Somes islands. Still widespread though sparsely distributed. Constituted 66% of skinks caught in pitfall traps on Mana Island 2018-2022. Fairly abundant on Kāpiti Island 2016 (Gollan 2016). Not detected recently in Zealandia although they were present when the fence went up.
Ornate skink	<i>Oligosoma ornatum</i> Gray, 1843	Likely to suffer where control of other pest animals leads to mouse irruptions. Commonly encountered in gardens in western suburbs of Wellington a few years ago. Presumed to be at lower end of population size range. Records in Papakowhai, Crofton Downs, Otari/Wilton's Bush (Melzer and Bell 2014), Huntleigh Park (Bell 2019a), Waterfall Bush (Kerp 2018). Rarest skink in Wellington City Reserves.	Naturally on Kāpiti Island and Zealandia where they're common, particularly in mouse free area. Reintroduced on Matiu/Somes Island. Not on Mana Island
Glossy brown skink	<i>Oligosoma zelandicum</i> Gray, 1843	No trend over 35 years at Pukerua Bay. Very similar to grass skinks, so likely under reported. Found in Johnsonville, Khandallah, Paekakariki escarpment (Callister 2017), Plimmerton, Pukerua Bay. Eastern boundary was previously thought to be along axial ranges, but known range extended further east now (NZHS website 2023). Presumed to be at lower end of population size range.	Present on Mana and Kāpiti Islands, strong recovery on Mana Island after mouse eradication and increased since rat eradication on Kapiti Island (Gollan 2016). In Zealandia, but not common. Not on Matiu/Somes.
Ngahere gecko	<i>Mokopirirakau</i> "southern North Island"	Increasing records in Wellington (eg, Otari, East Harbour) associated with intensive pest control (Melzer and Bell 2014, Romijn 2010). Most common in Wellington forests.	Arboreal so difficult to survey. Naturally on Kāpiti Island. Reintroduced to Mana and Matiu Somes Islands. Doing well in Zealandia. Most abundant gecko in Zealandia night surveys.

Common Name	Name and Authority	Mainland only	Island/sanctuaries
Minimac gecko	<i>Woodworthia</i> "Marlborough mini"	Abundant within restricted range from Lyall Bay to Makara and on Taputeranga Island. Overlap with <i>W. maculata</i> between Island Bay and Lyall Bay, otherwise allopatric. Northern limit. Trend data lacking but seemingly stable.	Not in islands or sanctuaries in the region.
Moko mangaeka/goldstripe gecko	<i>Woodworthia chryosiretica</i> Robb, 1980	Extirpated from mainland	Now restricted to Mana and Kāpiti islands.
Northern spotted skink	<i>Oligosoma kokowai</i> Melzer et al 2017	In serious trouble on mainland---not seen since 1970s at Turakirae (Herbert 2020). Recorded from but not seen recently at Plimmerton, Martinborough, Wairarapa coast. Currently known from Baring Head (Bell and Goldwater 2020), Te Kawakawa (Romijn and Masters 2020) and Ponatahi.	Thriving on Matiu/Somes and Makaro/Ward. Reintroduced to Mana Island and Zealandia but not doing well at Zealandia. Not on Kāpiti Island.
McGregor's skink	<i>Oligosoma macgregori</i> Robb, 1975	Extirpated from mainland	Recovering on Mana Island. Four natural and two translocated populations nationally all on islands
Tuatara	<i>Sphenodon punctatus</i> Gray 1842	Extirpated from mainland	Reintroduced to Matiu/Somes Island (1998), Zealandia (2005 and 2007). Proposal to translocate to Mana Island.
Northern grass skink	<i>Oligosoma polychroma</i> Patterson & Daugherty, 1990	Widespread and common. Some habitat loss to coastal development but not significant enough to meet Declining threshold. Increasing at Baring Head (Bell and Goldwater 2020). No evidence of decline at Turakirae Head.	Uncommon on Matiu/Somes relative to the mainland.

Common Name	Name and Authority	Mainland only	Island/sanctuaries
Moko pāpā/ Raukawa gecko	<i>Woodworthia maculata</i> Gray, 1845	More restricted to habitat than northern grass skink. Favour rocky divaricating shrub habitats. Uncommon in Wellington Reserves, but good numbers in Fensham (Bell 2018a). Found in hollow trees on farmland. Lots of reports from sheds around Miramar. Lyall Bay to Island Bay overlap with minimac gecko. Common around coast leading to risk of inundation from sea level rise.	Secure and increasing on islands.
Te Mokomoko a Tohu/Tohu gecko	<i>Hoplodactylus tohu</i> n.sp.	Historic range not on Wellington mainland	Introduced to Mana Island outside of its historic range. Didn't occur in the region naturally. Estimated populations growth rate between 6-10% pa on Mana Island (2009-2013), (Bell and Herbert 2017). Predicted extinction within 50 years is negligible
Newman's speckled skink Islands	<i>Oligosoma newmani</i> Wells & Wellington 1985	Historic range not on Wellington mainland	Introduced to Mana Island from Stephens Island c. 2005, subsequently discovered to differ from North Island species. One photograph ~2019, but no records since.

Appendix B

Table B1: Presence of lizard species in territorial authority districts on the mainland in the Wellington region

Common Name	Name and Authority	Kāpiti Coast District	Porirua City	Wellington City	Hutt City	Upper Hutt City	South Wairarapa District	Carterton District	Masterton District	Tararua District
Pacific gecko	<i>Dactylocnemis pacificus</i> Gray, 1842					*				
Whitaker's skink	<i>Oligosoma whitakeri</i> Hardy, 1977		*							
Kupe skink	<i>Oligosoma aff. infrapunctatum</i> "southern North Island"							*	*	
Moko kākārīki/ barking gecko	<i>Naultinus punctatus</i> Gray, 1842	*	*	*	*	*	*	*	*	*
Copper skink	<i>Oligosoma aeneum</i> Girard, 1857	*	*	*	*	*	*	*	*	*
Ornate skink	<i>Oligosoma ornatum</i> Gray, 1843	*	*	*	*	*	*	*	*	*
Glossy brown skink	<i>Oligosoma zelandicum</i> Gray, 1843	*	*	*	*	*	*			
Ngahere gecko	<i>Naultinus punctatus</i> Gray, 1842	*	*	*	*	*	*	*	*	*
Minimac gecko	<i>Woodworthia</i> "Marlborough mini"			*						
Northern spotted skink	<i>Oligosoma kokowai</i> Melzer et al. 2017	*	*	*	*	*	*	*	*	*
Northern grass skink	<i>Oligosoma polychroma</i> Patterson & Daugherty, 1990	*	*	*	*	*	*	*	*	*
Moko pāpā/ Raukawa gecko	<i>Woodworthia maculata</i> Gray, 1845	*	*	*	*	*	*	*	*	*

Appendix C

Table C1: Priority management and survey actions for lizard species in the Wellington region

Common Name	Name and Authority	Management Priority	Management Actions	Survey Priority	Survey Actions
Duvaucel's gecko	<i>Hoplodactylus duvaucelii</i> Duméril & Bibron, 1836	N/A	DOC programme	N/A	Regionally extirpated
Robust skink	<i>Oligosoma alani</i> Robb, 1970	C	Translocation options may arise	N/A	Regionally extirpated
Pacific gecko	<i>Dactylocnemis pacificus</i> Gray, 1842	C	Ensure any new specimens found have genetic samples taken to allow assessment of whether they're likely to be from a remnant native population	C	Encourage citizen science reporting
Whitaker's skink	<i>Oligosoma whitakeri</i> Hardy, 1977	N/A	DOC programme	A	Need to chase up possible sightings
Kupe skink	<i>Oligosoma aff. infrapunctatum</i> "southern North Island"	N/A	Population not re-located in region to date	A	Survey completed 2017/2018, but no individuals found. Re-survey in Tararua Forest Park where recent photograph was taken.
Moko kākārīki /barking gecko	<i>Naultinus punctatus</i> Gray, 1842	A	Find appropriate managed sites	A	Encourage citizen science reporting
Copper skink	<i>Oligosoma aeneum</i> Girard, 1857	A	Find appropriate managed sites	B	Re-monitor at known sites. Recent survey completed at Pukerua Bay found evidence of population recovery but losses likely to be occurring across the landscape
Ornate skink	<i>Oligosoma ornatum</i> Gray, 1843	A	Continue management at appropriate sites	A	Establish outcome monitoring programme at management sites
Glossy brown skink	<i>Oligosoma zelandicum</i> Gray, 1843	A	Find appropriate managed sites	A	Complete coastal surveys to determine population trend
Minimac gecko	<i>Woodworthia</i> "Marlborough mini"	A	Find appropriate managed sites	B	Survey habitat as last surveyed 20 years ago
Common Name	Name and Authority	Management Priority	Management Actions	Survey Priority	Survey Actions
Ngahere gecko	<i>Mokopirirakau</i> "southern North Island"	A	Continue management at appropriate sites	A	Establish outcome monitoring programme at management sites. Survey unmanaged sites to establish population trend.

Common Name	Name and Authority	Management Priority	Management Actions	Survey Priority	Survey Actions
Minimac gecko	<i>Woodworthia</i> "Marlborough mini"	A	Find appropriate managed sites	B	Survey habitat as last surveyed 20 years ago
Moko mangaeka/goldstripe gecko	<i>Woodworthia chrysoiretica</i> Robb, 1980	N/A	DOC programme	N/A	DOC programme
Northern spotted skink	<i>Oligosoma kokowai</i> Melzer et al. 2017	A	Find appropriate managed sites	A	Continue surveys at Baring Head Revisit of Wairarapa site. Complete coastal surveys
McGregor's skink	<i>Oligosoma macgregori</i> Robb 1975	N/A	DOC programme	N/A	DOC programme
Northern grass skink	<i>Oligosoma polychroma</i> Patterson & Daugherty, 1990	A	Establish salvage process	C	Continue citizen science reporting
Moko pāpā/ Raukawa gecko	<i>Woodworthia maculata</i> Gray, 1845	A	Establish salvage process	C	Continue citizen science reporting
Te Mokomoko a Tohu/Tohu gecko	<i>Hoplodactylus tohu</i> n.sp.	N/A	DOC programme	N/A	DOC programme
Newman's speckled skink	<i>Oligosoma infrapunctatum</i> Boulenger, 1887	N/A	DOC programme	N/A	DOC programme

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