Conservation status of bat species in the Wellington region

Greater Wellington
Te Pane Matua Taiao

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Cover photo Pekapeka (Long-tailed bat) Credit: Colin O'Donnell

Contents

1. Introduction

This report constitutes the first regional conservation status assessment of bats in the Wellington Region. It builds on the national assessments published in 2010, 2013 and 2018 (O'Donnell et al 2010, O'Donnell et al 2013, O'Donnell et al 2018).

The New Zealand Threat Classification System (NZTCS) assesses the threat status of New Zealand species at a national scale (Townsend et al 2008). The threat rankings are also used as a basis for prioritising conservation actions, research and monitoring, as well as natural resource management decisions. The Department of Conservation is the agency tasked with managing indigenous species, however regional and district councils have a statutory obligation to manage the habitats of threatened species under the Resource Management Act 1991. An understanding of the presence of threatened species and their conservation requirements in each region and district is needed to meet that obligation. It is also important to understand the threats faced by species at a regional level, as ongoing biodiversity decline occurs across New Zealand and local information can aid both resource management and conservation action decision-making.

2. Methodology

An expert panel, comprised of Colin O'Donnell, Moira Pryde Julia Ryan and Owen Spearpoint convened on 21 December 2022 to assess the conservation status of bat species in the Wellington region. The 2017 national conservation status list (O'Donnell et al 2018) served as a basis for the assessment. Of the six resident native bat taxa listed in the national report, only two taxa were considered to be present in the Wellington region: *Chalinolobus tuberculatus* (pekapeka/long-tailed bat) and *Mystacina tuberculata rhyacobia* (pekapeka/central lesser short-tailed bat). Nationally the lesser short-tailed bat has been divided into three subspecies with a northern taxa being found in Northland and on Little barrier Island and a southern taxa on Whenua/Codfish Island and in the Fiordland and north-western Nelson areas. The central lesser short-tailed bat subspecies is known from central and southern North Island, including Taranaki and East Cape (Department of Conservation website 2022).

In previous national bat conservation status lists, long-tailed bats had been split into "North Island' and "South Island" taxa. It was noted however in O'Donnell et al 2018 that recent analyses of the structure and phylogeography of long-tailed bat populations had led to long-tailed bat (North Island) being classed as taxonomically indistinct and that long-tailed bats should be treated as one taxon (Dool et al 2016). As a consequence, the taxonomically indistinct species *Chalinolobus tuberculatus* (North Island) was not considered separately in this assessment. *Pteropus scapulatus* (little red flying fox, an Australian vagrant) has been found in Auckland in the 1920s but has not been recorded in the region.

A methodology to create regional threat lists was developed by a collaborative group comprising representatives from the Department of Conservation (DOC), regional councils and a local authority (see Crisp 2020). The resulting regional threat listing methodology leverages off the NZTCS but applies a species population threshold adjusted to the regional land area considered (in relation to the national land area) for species that are not nationally Threatened. The assigned regional threat status cannot be lower than that of the national threat status, but can be higher, (eg, a Nationally Vulnerable species could be assessed as being Regionally Critical). Other assessments made in the regional threat listing process include identifying populations that are national strongholds and the use of regional qualifiers, such as natural or historic range limits.

At the 21 December 2022 meeting, the NZTCS criteria were used to assign a regional threat status to the bat species in the region. The Wellington region was not considered to be a national stronghold for either of the two bat species (the region would need to have more than 20% of the national population). Information was gathered about what is known of the past and current distribution of long-tailed and short-tailed bats in the region. The latest regional data contained in the National Bat Database is shown in Figure 3.1.

3. Results

3.1 Conservation status listing

Both bat species in the region; *Chalinolobus tuberculatus* (pekapeka/long-tailed bat) and *Mystacina tuberculata* (pekapeka/central lesser short-tailed bat) were designated as Regionally Critical (Appendix A; Table A1). There was some discussion about whether or not central lesser short-tailed bat should be listed as Regionally Data Deficient, rather than Critical, but it was decided to retain the Critical categorisation, given that a colony of this species had been described and monitored in the region within the past 10 years. While the central lesser short-tailed bats are no longer present at the monitored site, it is feasible that they have moved elsewhere in the Tararua or Remutaka Ranges, as suggested by a recent recording of a short-tailed bat near Mt Bawbaw.

The Regional Qualifier, Data Poor, is being used for both bat species, as little is known about their distribution in the Wellington region. Range Restricted has been applied as a Regional Qualifier for central lesser short-tailed bat, as this species has specific habitat requirements, needing large areas of old-growth forest with many large trees suitable for roost sites (Llyod 2001). Long-tailed bats have shown an ability to survive in rural landscapes (O'Donnell 2001a) and even in urban areas (Dekrout et al 2014). *Mystacina robusta* (greater short-tailed bat) have been noted as Regionally Extirpated, as fossils have been found in the region.

3.2 Distribution information

3.2.1 Short-tailed bats

Lesser short-tailed bats are thought to have been widespread throughout pre-human New Zealand (Daniel 1990). Fossils of lesser short-tailed bat (*M. tuberculata*) have been found in the Wairarapa and accounts of large colonial roosts were reported in the area in the nineteenth century (as referenced in Lloyd 2001). Fossils of greater short-tailed bat (*Mystacina robusta*) have also been found in the Wairarapa, but no specimens have been recorded on mainland New Zealand since European arrival (Lloyd 2001). The major causes of decline of lesser short-tailed bats are thought to be habitat loss, particularly of old-age roosting trees and the ongoing pressure from introduced mammals (O'Donnell et al 2010). This species is thought to be very susceptible to rats (*Rattus* spp.) and stoats (*Mustela erminea*), as they forage on the ground, but cats (*Felis catus*) are also thought to be major culprits of population declines in both extant bat species (O'Donnell 2000, Scrimgeour et al 2012, Borkin et al 2022).

Recordings of lesser short-tailed bats in the Tararua Ranges have been made over a number of years (see Figure 3.1). Around 300 central lesser short-tailed bats were identified in 1999 in the Holdsworth area of the lower eastern Tararua Ranges. A bat translocation from this colony to Kapiti Island was attempted in 2004 and stoat and rat control put in place in 2008-2009. The colony disappeared from the area around five years ago and central lesser

short-tailed bats have not been rediscovered in the Tararua Ranges since that time. Recently however, central lesser short-tailed bats have been recorded in the Remutaka Ranges (south of the Tararuas) and further survey efforts are planned.

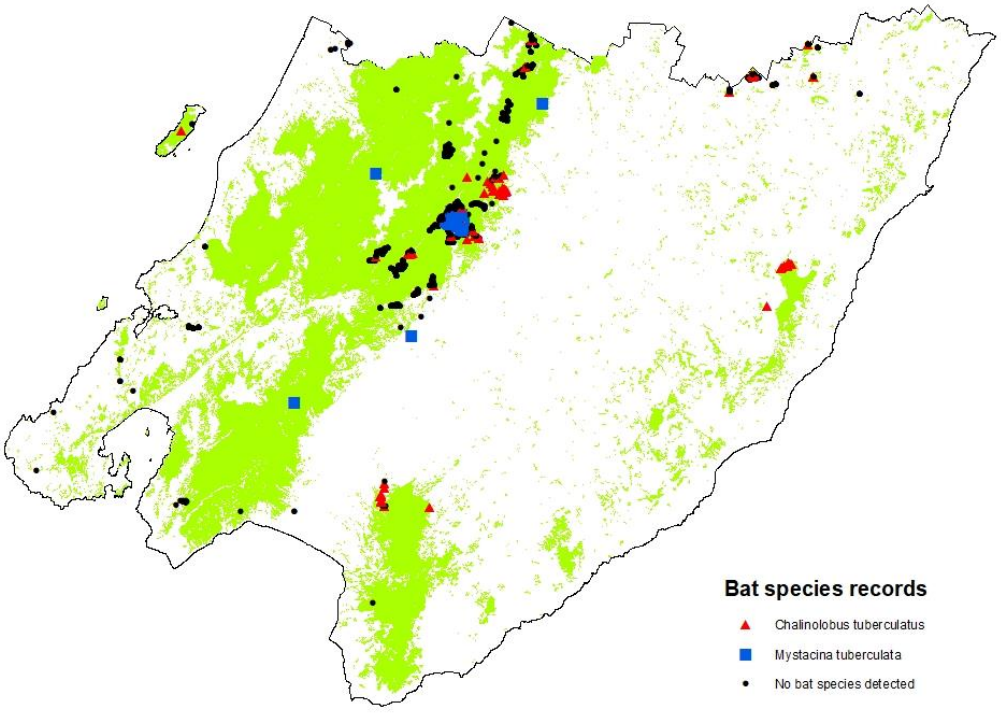

Figure 3.1: Bat surveys conducted in the Wellington region as accessed from the National Bat Database 23 December 2022. Light green indicates remaining indigenous forest cover based on the Landcover Database v5.

3.2.2 Long-tailed bats

Long-tailed bats were thought to be common throughout New Zealand in the 1800s but were becoming scarce in many districts by 1900 – 1930 (O'Donnell 2001a). There is little historic information about the presence of long-tailed bats in the Wellington region, with few records up until 1995 detailed in the distribution map of O'Donnell 2001a. Sightings were noted by local DOC staff in some old-growth native forests in the Wairarapa in the 1990s and long-tailed bats were recorded on Kapiti Island in 2017. Victoria University made some discoveries of this species in Waihora on the western side of Aorangi Forest in 2019.

The Sustainable Wairarapa Bat Group began monitoring in forest remnants in northern Wairarapa in 2021 and have recordings of long-tailed bats at numerous sites, including roost sites at Rewa Bush and in the lower eastern Tararua Ranges. Other native forest remnants have been identified by the group as feeding sites, with further study being needed to determine if roost sites are present at some of those locations (Carylon 2021, Ryan 2022).

Relevant territorial authorities have been listed in other regional threat lists, (eg, Crisp 2020). In the case of bats, with present knowledge, central lesser short-tailed bats have only been recorded in Carterton and South Wairarapa District Council areas, while long-tailed bats are present in Masterton, Carterton, South Wairarapa District Council and Kapiti Coast (Kapiti Island) jurisdictions.

3.3 Recommendations for conservation actions

Recommendations for conservation actions for bats in the Wellington region are summarised in Appendix 1; Table A.2. Survey and monitoring activities, as well as maintaining mainland populations of both central lesser short-tailed and long-tailed bats have been highlighted as important activities in the national bat recovery plan (Molloy 1995). Following up on the recent detection of short-tailed bats in the Remutaka Forest Park is considered a high priority.

The recent bat surveys that have been completed by Sustainable Wairarapa Bat group have provided a wealth of information about the presence of long-tailed bats in the Wairarapa. Moira Pryde, Technical Advisor, Department of Conservation has encouraged getting pest control in place in all the reserves that have bats and completing further survey work to detect long-tailed bats in other reserves as priorities.

4. Discussion

The central lesser short-tailed bat and the long-tailed bat have both been assessed as being regionally Critical for the Wellington region, but their distribution requires further survey. The information provided in this report can aid decision-making by DOC, regional councils and district councils, including in the consideration of consenting proposals. Understanding the occupancy of threatened taxa across the regional landscape is key to their protection and to halting biodiversity decline in the region. While the currently-known locations of bat species in the region are mainly on the DOC-managed public conservation lands, feeding areas have also been identified on private land. The aspirations of communities to improve ecological outcomes in the catchments where they live is growing and knowledge of how to protect vulnerable species is becoming increasingly important. Both bat species are highly mobile, in both forested and fragmented landscapes with colonies ranging over >150 km^2 (O'Donnell 2001b; Dekrout 2009; Christie & O'Donnell 2015; Davidson-Watts Ecology 2019). Therefore, conservation is needed at a landscape scale, and requires management actions on both public and private lands, and needing to involve collaborations among Councils, government departments, iwi, the public and other stakeholders.

Bats are New Zealand's only extant native land mammal. The lesser short-tailed bat is an ancient species that is endemic to New Zealand. In contrast, the long-tailed bat is a younger species but has still been present in New Zealand for over one million years. Both bat species feed on insects, but lesser short-tailed bats also eat fruit and nectar and are thought to be an important pollinator of the threatened endemic plant *Dactylanthus taylorii* (pua o te Reinga/wood rose). Unlike most other bat species that feed on the wing, short-tailed bats can forage by walking around on the forest floor or clambering over tree trunks. This places them at unique risk of introduced predators. The dramatic historic decline in the populations of both of these species is cause for concern when considering the roles they will have previously played in New Zealand's ecosystems. It would be useful to create a pekapeka page on the regional council website to provide information about the distribution of bats in the region and what they can do to protect bats.

Bats are long-lived and populations have good recovery potential if threats are removed (Sedgeley et al 2012). Both bat species only produce one pup per year, making populations very vulnerable to pressures that cause breeding failure. This is illustrated by recruitment modelling from re-capture studies. It was predicted that over three generations a long-tailed bat population would decline by over 90 percent without predator management (O'Donnell et al 2017). Predator control associated with management for improving population viability has been successful at some sites, with larger populations being more resilient to fluctuations in predator risks. Integrated pest control, protection of roost sites, protection of freshwater and terrestrial foraging habitats and the restoration of roosting and foraging habitat have been listed as being essential management techniques for bat recovery (Sedgeley et al 2012).

The main predators of concern for bat populations are mustelids, cats, rats and possums. A major predation event at a roost in the central North Island was caused by a single feral cat (Scrimgeour et al 2012). Mustelids, (particularly stoats), rats and brush-tail possums (*Trichosurus vulpecula*) have also been implicated as key predators of both short-tailed and long-tailed bats. A population viability analysis based on long-tailed bats roosting in beech forest indicated that bat survival was lower in years when rat and stoat numbers increased due to beech masting events (Pryde at al 2005).

While habitat degradation/loss was a major contributor to the decline in bat numbers in the past, the main ongoing concern regarding habitat is related to the loss of old-aged roost trees or degradation of important foraging habitat (Sedgeley 2003). Climate change concerns that have been raised include the risk of losing old-age trees to increasing storm intensities/ frequencies, changes in bat hibernation conditions and increased predator irruption frequencies (as referenced in O'Donnell et al 2017). Other contributors to bat population declines are thought to be human disturbance of roost sites, competition from wasps for food supply and loss of freshwater foraging habitat through activities that impact waterways near roost sites. Long-tailed bats have been shown to make extensive use of river and riparian habitats (Griffths 2007) and linkages between forest remnants is considered important for retaining genetic diversity (O'Donnell et al 2017).

There is a need for greater search effort for bats within the Wellington region. Focussed regional search effort for both short-tailed and long-tailed bats are a priority and the ongoing work by the Sustainable Wairarapa Bat group is focussing efforts on old-growth forest remnants in the Wairarapa. Roost trees for long-tailed bats are usually 200 – 650 years old and one group of bats can use over 100 different roost trees, as they continually shift roost sites O'Donnell and Sedgeley 2006). In podocarp-hardwood forests, roosts have been found in large rimu, miro, kahikatea, matai and totara trees, while in beech forests, the majority of roosts were found in red beech. In a fragmented landscape where trees are limited long-tailed bats can end up in much smaller and younger trees (eg, in Hawkes Bay, South Canterbury, Pelorus Bridge). Lesser short-tailed bats tend to use larger roost cavities than long-tailed bats and have been found most commonly in red beech in mixed beech forest and large Hall's totara, rimu, southern rata and miro trees in podocarp-hardwood forests (Sedgeley et al 2012). There is information available to aid search effort prioritisation for long-tailed bats in terms of tree height information obtained from analyses of regional LIDAR information and the Wellington region Singers/Rogers historic ecosystem typing (GWRC tall tree data, Singers et al 2018).

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Appendix A

Table A1: Conservation status of bats in the Wellington region

Common Name	Name and Authority	Regional Conservation Status	National Conservation Status	Regional Criteria	National Stronghold	Regional Population	Regional Trend	Regional Qualifiers
Pekapeka Long-tailed bat	*Chalinolobus tuberculatus* Forster, 1844	Critical	Critical	B1/1	No	250 -1000	50-70% decline	DP
Pekapeka Central lesser short-tailed bat	*Mystacina tuberculata rhyacobia Hill & Daniel 1985*	Critical	Declining	A1	No	<250	50-70% decline	DP, RR
Greater short-tailed bat	*Mystacina robusta* Dwyer 1962	Extirpated	Data deficient	N/A	N/A	N/A	N/A	N/A

Regional qualifiers:

DP Data Poor RR Range Restricted

Table A2: Priority management and survey actions for bats in the Wellington region

Common Name	Name and Authority	Management Priority	Management Actions	Survey Priority	Survey Actions
Pekapeka Long-tailed bat	*Chalinolobus tuberculatus* Forster 1844	A	Protection of known roost sites from rats, stoats and cats, as a priority	A	Continuation of surveys for long-tailed bats in the Wairarapa, particularly in the eastern Wairarapa native forest remnants
Pekapeka Central lesser short-tailed bat	*Mystacina tuberculata rhyacobia* Hill and Daniel 1985	N/A	No roost site identified at present	A	Checking of Mt BawBaw site a priority. Other surveys in the Tararaua Ranges would be useful. A national bat monitoring project is planned that includes sites in the Tararua Ranges.