

# South Island Long-Tailed Bat

*Chalinolobus tuberculatus*

## Constantly shifting



South Island long-tailed bat with identifying wing band. DOC

## Quickfacts

A distinct race of the endemic long-tailed bat

Prefers to roost in cavities formed in large trees of indigenous old growth forest of the South Island

Threatened by introduced animals, disturbance and fragmented habitat

## The importance of quality habitat .... and few predators

New Zealand's long isolated prehistory produced a unique flora and fauna uncharacteristic of even its nearest neighbour, Australia. Before human arrival, birds, insects and reptiles dominated the New Zealand faunal assemblage, with some birds filling niches often occupied by mammals on other continents. New Zealand's indigenous terrestrial mammal fauna is very sparse in comparison with Australia, with only three mammals, all bats, but each performing their own ecological role. Unfortunately, since the arrival of humans, the greater short-tailed bat (*Mystacina robusta*) has become extinct, and the long-tailed (*Chalinolobus tuberculatus*) and lesser short-tailed bats (*Mystacina tuberculata*) are both now endangered. South Island long-tailed bats, distinguished from their North Island counterparts through morphological and echolocation differences, have declined rapidly following the arrival of European settlers.

Early settlers were drawn to the South Island in the 1860's to work on the goldfields, and the population grew rapidly. These settlers introduced multiple mammalian predators and cleared more and more land, turning forests into fragments, and the extent of good



quality habitat available to the wildlife dwindled. Long-tailed bats disappeared from once lush forests, now converted to pastures grazed by sheep, and by the 1990's they were clearly in decline, with roosting sites now empty and overrun with invasive mammals. The establishment of Fiordland National Park in 1952, provided some security against felling of roost trees for South Island long-tailed bat populations living throughout the Eglington Valley and surrounding areas. Regardless, even with that park's high quality habitat, predation, competition for roost sites and food were causing a 5% per annum population decline. The only known population of South Island long-tailed bats in the east of the South Island, at Hanging Rock, provides only poor quality roosts and the high predator numbers are causing a population decline there of 9% per annum. Once widespread over the South Island, long-tailed bats are now restricted to just 15 populations.

The importance for long-tailed bat survival of an area having abundant roost sites was recognised when researchers found that long-tailed bats shift between roosts each day, and often do not reuse the same roost twice. Long-tailed bats either roost together colonially or individually, and prefer to roost in large, cavity riddled red beech trees (*Fuscospora fusca*) such as found within the Eglington Valley, where they rest during the day and care for their young. Rock-crevices, caves, man-made structures and foliage are also used as roost sites, but are of poorer quality. By roosting in poor quality roosts, long-tailed bats increase their susceptibility to predation, poor health and reduced productivity. Long-tailed bats often exhibit torpor (periods of inactivity to save energy) during cold weather which increases their vulnerability to predation, especially when roosting in poor quality habitats.

Predation from exotic mammals (notably, rats, stoats, cats and possums) and competition for roost sites from exotic animals such as starlings *Sturnus vulgaris* and rodents, are the primary causes of the population declines and it is feared that many populations will go extinct within the next 50 years without conservation action. In addition, the numbers of rodents and stoats in beech forests commonly explode following beech seed masts, requiring intensive control efforts using traps and poisons, and large swarms of wasps compete for their food. Discovery of long-tailed bats living in the Iris Burn valley in Fiordland led to the implementation of rodent control there in 2014, with the monitoring indicating an increase in the bat's population size from 54 bats in 2013, to 63 in 2015. Even in the absence of threats, long-tailed bat populations increase slowly as long-tailed bats produce only one pup per year, and only mix with their own roost-group, even if they use foraging grounds shared with other groups.

Monitoring efforts have provided a means to detect these population declines with technological advances increasing the ability to detect this highly difficult to find species. Bat detectors such as the Bat Box III detector use the entire frequency range of long-tailed bats with best detection of this species when set at 40kHz. Bats have also been radio tracked to find roost sites, and follow an individual's movements. Bats can be captured in Harp traps (vertical lines of nylon which the bat's echolocation cannot

detect) when they emerge during the evening, and can also be banded for mark-recapture studies. Bat counts can be an informative indicator of successful (or unsuccessful) predator control due to the bat's high susceptibility to rodent predation.

## Long-tailed bat biology

Long-tailed bats are small chocolate brown flying mammals, easily fitting in the palm of your hand. Their small ears and the large membrane connecting their tail and legs (visible even when in flight) are the easiest features to use to distinguish them from the short-tailed bat. They are aerial foragers, foraging 'on the wing'.

Long-tailed bats belong to the Vespertilionidae family, a widely-distributed family with close relatives all belonging to the *Chalinolobus* genus in Australia, New Caledonia and New Guinea. Each species has its own distinctive echolocation calls and morphology. There are also distinct differences in echolocation and morphology between North Island and South Island long-tailed bats, suggested each are best considered an Evolutionary Significant Unit. However, recent molecular data suggests that North and South Island long-tailed bats should be managed together, with efforts to conserve and protect remaining populations.

## What next?

The threats to the survival of the South Island long-tailed bat are:

1. Predation from exotic mammalian predators
2. Competition for roosts from exotic mammals and birds
3. Poor quality habitat
4. Habitat fragmentation

Successfully protecting the South Island long-tailed bat from these threats must be achieved in order for the conservation programme to succeed. Ideally, this should be done by:

1. Continue population monitoring

Continuing the population monitoring will confirm that conservation efforts are providing protection for this species and can also lead to improvements in monitoring techniques. Continued population monitoring may also lead to discovery of additional locations where these bats are present. Mark-recapture studies have detected population changes in the Eglington Valley previously unnoticed using other monitoring

methods.

2. Continue predator control in areas inhabited by long-tailed bats

The risk exotic predators pose to long-tailed bats can be reduced by controlling pests in areas inhabited by long-tailed bats, especially in areas with poor roost quality.

3. Protect existing old-growth forest

By ensuring existing old growth forest is not lost, they will provide an abundance of trees with cavities for the bats to roost. In areas with poor quality habitats, bat hotels (artificial roosts) may be used to provide additional roosts.

4. Provide secure habitat within pine plantations and poor quality habitats

As long-tailed bats have been found to inhabit commercial pine tree plantations, it is important that operators are aware of areas inhabited by bats, and to work together to ensure the bats' persistence when the forest is logged.

The cost of this work is not known, but implementing a predator control programme (the most important activity) at a site typically costs between \$5,000 and \$50,000 per year. This cost can be reduced by co-opting volunteers into the programme.

## More information

Website: DOC – Iris Burn Monitoring. [Link](#)

Website: DOC- Long-tailed bat. [Link](#)

Website: Wikipedia – Fiordland National Park. [Link](#)

Scientific paper: Phylogeographic-based conservation implications for the New Zealand long-tailed bat, (*Chalinolobus tuberculatus*). By S. E. Dool, C. F. J. O'Donnell, J. M. Monks, S. J. Puechmaille, G. Kerth. Conservation Genetics, Vol. 17, 2016. [Link](#)

Scientific paper: The importance of exotic plantation forest for the New Zealand long-tailed bat (*Chalinolobus tuberculatus*). By K. M. Borkin and S. Parsons. New Zealand Journal of Zoology, Vol. 37, 2010. [Link](#)

Report: Bat (Peka Peka) Recovery Plan (*Mystacina, Chalinolobus*). By Janice Molloy. Threatened Species Recovery Plan Series No. 15. Department of Conservation, Wellington, 1995. [PDF](#)



# Photos



Bat harp trap in Fiordland's Eglington Valley. DOC



Bat with miniaturised radio transmitter and aerial glued to its back. DOC



Attaching miniaturised radio transmitter (on knee) to bat, Eglington Valley, Fiordland. DOC



Removing bat (in bag) from harp trap. Note fine vertical nylon lines. DOC

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