Demystifying *Mystacina*:
Radio-tracking lesser short-tailed bats in New Zealand

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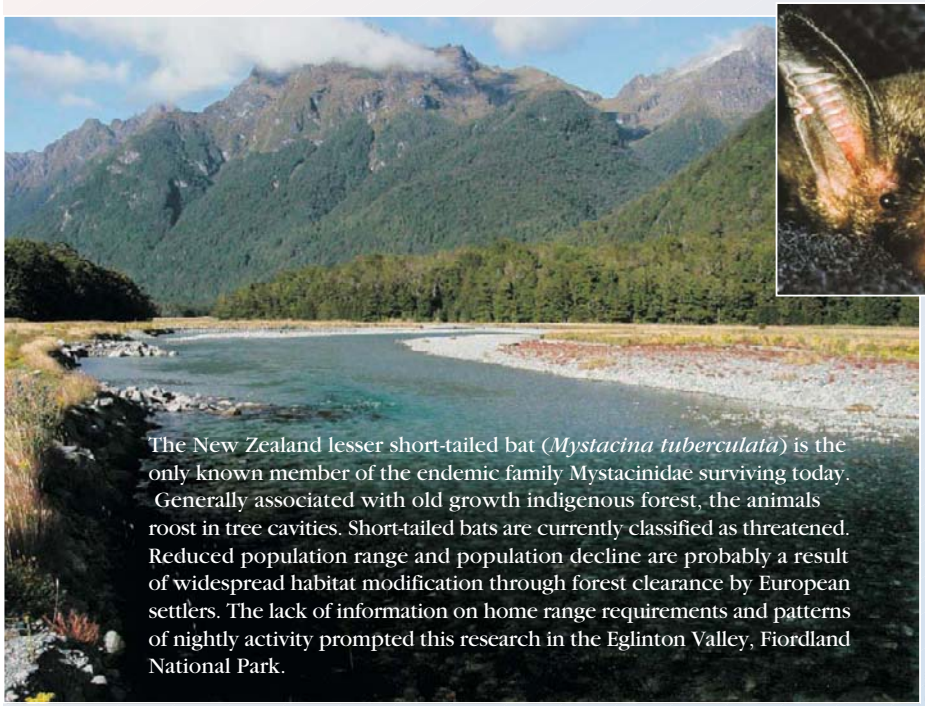


The New Zealand lesser short-tailed bat (*Mystacina tuberculata*) is the only known member of the endemic family Mystacinidae surviving today. Generally associated with old growth indigenous forest, the animals roost in tree cavities. Short-tailed bats are currently classified as threatened. Reduced population range and population decline are probably a result of widespread habitat modification through forest clearance by European settlers. The lack of information on home range requirements and patterns of nightly activity prompted this research in the Eglinton Valley, Fiordland National Park.

P. Dilkes

Eglinton Valley, Fiordland National Park

L. Lumsden

Location of Eglinton Valley, Fiordland National Park

C. O'Donnell

Bat roost in a large beech tree

What size area does a population use?

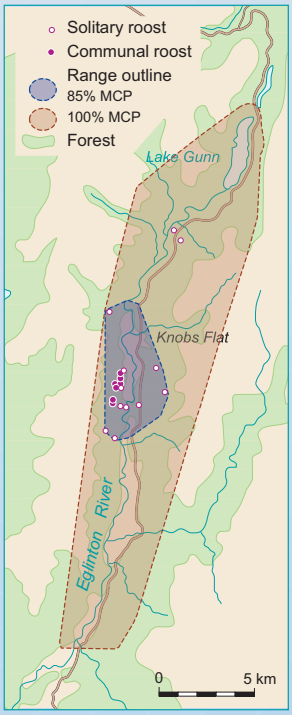
I radio-tagged 21 short-tailed bats and found them to range collectively over a large area of 147 km².

Most activity actually covered a much smaller area of 18 km².

Bats generally roosted together as a group (mean ± SD group size = 324 ± 82 bats) in a tree cavity; sometimes they roosted by themselves.

C. O'Donnell

Bats caught for tagging in a harp trap



What size area do individuals use?

Home range size varied between individuals (100 % minimum convex polygons, MCPs: range = 1.3–62.2 km²).

Most individual ranges still covered quite a large area (100% MCPs: median = 4.8 km²).

Range shapes were confined by the Valley and were generally long and narrow (home range length: range = 2.2 – 23.0 km).

Individual bats travelled large distances in a night and were capable of flying at speeds up to 44.3 km/h.

Their mean flight speed of 2.5 km/h was relatively slow and most activity was concentrated in one or several small core areas (85% cluster polygons: range = 0.01 – 2.7 km²).

Home range overlap was limited. Moderate levels of overlap among individual home ranges (median = 26.8%) decreased further in core areas (median = 3.7%).

When are short-tailed bats active?

Emergence of short-tailed bats from their day roosts was significantly related to sunset time. On average, emergence occurred 42 minutes after sunset.

The length of time individual short-tailed bats spent away from their day roost was strongly related to night length (i.e. dusk to dawn).

Bats remained active throughout the night (mean ± SD = 457 ± 46 min) with only short (mean = 16 ± 8 min) and infrequent periods of inactivity recorded.

J. Sedgeley

Bat on a log

Implications for conservation

Major findings of this research show short-tailed bats have:

- Large home ranges
- Extended nocturnal activity
- Patchy distribution of core activity areas
- Low range overlap

Limited food resources in the cold temperate climate of Fiordland might explain some of these behaviours.

These range requirements have implications for reserve design: areas for short-tailed bat conservation should be large.

Further home range research on other populations of short-tailed bats is necessary, because range requirements may differ for populations in other locations and different habitat types.

Department of Conservation
Te Papa Atawhai

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