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VOLUME 23, NO. 2 Summer 2005

Extreme Measures
New Zealand biologists try transplanting endangered baby bats
Gail Schultz

Bats are the only native land mammals in all of New Zealand, and the two surviving species are found only on this nation of islands. Both species, which evolved in a land almost free of ground-based predators, are under constant attack by non-native animals – rats, feral cats, ferrets, weasels and possums – and by the continuing loss of habitat to farms and towns. Now an extraordinary, and probably unique, effort is being undertaken to save the en-dangered lesser short-tailed bat (*Mystacina tuberculata*), the most terrestrial of the world's bats.

The New Zealand Department of Con-servation captured pregnant fe-males, which gave birth and raised a total of 20 pups in captivity. The pups were then released in a predator-free forest reserve on Kapiti Island, with the hope that the young bats will assign their homing instinct to this new home.

The problem that has plagued efforts to transplant bats from areas of high risk to more congenial natural sites is their very strong homing instinct. A previous attempt to transfer adult bats from one island to another failed when, from all indications, the bats simply flew back to their original home.

"A cunning solution to this problem has been developed and is being tried in this project," says Con-servation Minister Chris Carter. "If it works, it could prove enormously helpful in the preservation of native bat species."

The second survivor species is the long-tailed bat (*Chalinolobus tuberculatus*), which is widespread across North Island and about half of South Island. It's found from sea level to the tree line in the mountain ranges and roosts and feeds along the forest mar-gins. Since long-tailed bats will roost in houses, farm buildings and mountain huts, they are the most likely bats to be seen by the public.

New Zealand also once was the only home of the greater short-tailed bat (*Mystacina robusta*). The species is now considered extinct, largely because of predation by ship rats that arrived with European settlers some 150 years ago. In 1962, the foreign predators appeared on previously rat-free islands – the bats' final bastions; no greater short-tailed bat has been reported since 1965.

Settlement also removed about two-thirds of New Zealand's lowland forests. And even the Polynesian Maori, who arrived in New Zealand about 1,000 years ago, brought predatory Polynesian rats as unintended passengers.

The lesser short-tailed bat, once -widely dispersed across the islands, survives now only in a handful of scattered locations. These remarkable bats, uniquely adapted to life on the ground, seem to eat just about anything, including insects, fruit and nectar. They spend much of the night running up tree trunks and along branches or burrowing in the leaf litter and humus on the forest floor searching for food (see *BATS*, Fall 1985). They burrow into

rotten logs and trees to excavate their own roosts or use seabird burrows as roosts and feeding sites.

Such scampering is possible because of a unique method of folding their delicate wings to protect them from injury. They walk on robust hind legs and feet and use their forearms as front legs.

This decidedly unbatlike behavior pro-bably evolved over millions of years be-cause of the complete absence of mammalian predators. Many species of New Zea-land birds have become either weak fliers or completely flightless for the same reason. It's easy to see why short-tailed bats and many species of New Zea-land birds are extremely vulnerable to introduced predators.

This leads us to the most ambitious conservation project ever attempted in New Zealand. Pregnant bats were captured in December 2004 from a threatened colony on Tararua Forest Park and taken to the Pukaha Mount Bruce National Wildlife Centre. There the moms-to-be were kept in a specially designed enclosure with a maternity roost – a room insulated with polystyrene walls and fitted with ample grooved perches. A total of 20 pups were born between Christmas and late January 2005. For about four weeks, pups were nursed by their mothers. After the young learned to fly, however, the mothers were returned to their Tararua home.

Once their caretakers were confident the pups could feed themselves, they were introduced to carefully selected habitat areas on Kapiti Island in February. Initially placed inside a temporary aviary and provided food to supplement foraging, the young bats seem to be mostly weaning themselves of the aviary.

The bats seem to be accepting their new home and staying put on the island. Five bats were fitted with radio transmitters and tracked to a total of 10 roost trees. Various monitoring efforts will continue periodically throughout the year.

The long-term goal of the Kapiti project is to establish a secure population of genetically distinct short-tailed bats. These bats are part of the so-called Wiohine populations, last of the short-tailed bats in the lower half of North Island. Isolated from other members of the species for at least 90,000 years because of volcanic activity, biologists believe only about 300 of these bats remain. The Department of Con-ser-vation hopes this new colony will succeed in its much-safer new home.

"Our hope is the pups are young enough to lack a homing instinct and will remain on Kapiti Island [and that] Kapiti will become the location they home to," Carter said. "The research suggests this could work. If it doesn't, then the bat-husbandry techniques developed for the project will still prove valuable in the future. A willingness to push boundaries and try new things is exactly what conservation in New Zealand needs."

Gail Schultz, from Hayward, California, has been a globe-trotting writer for more than 20 years.

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