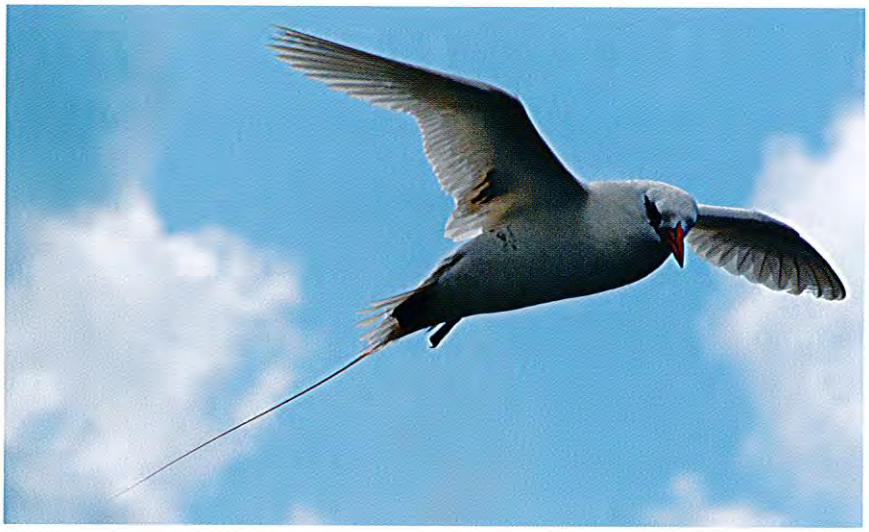
Eradicating cats and black rats from Christmas Island

A long-term goal to rid Christmas Island of cats, and to eradicate black rats, is already proving successful in increasing nestling success of red-tailed tropicbirds.

by Dave Algar, Neil Hamilton,
Mark Holdsworth and Sue Robinson

There is extensive evidence that the introduction of cats (*Felis catus*) to offshore and oceanic islands around the world has harmed endemic land vertebrates and breeding bird populations. Island faunas that have evolved in the absence of predators are particularly susceptible to cat predation. Christmas Island, 2,600 kilometres off the coast of Western Australia, is no exception and four of the five mammal species that were present on the island at European settlement have since become extinct (see 'New tools for fighting ferals', *LANDSCOPE*, Autumn 2010).

While several factors are likely to have contributed to the demise of these native animals, including disease, habitat destruction and the proliferation of the exotic yellow crazy ant (*Anoplolepsis gracilipes*), the introduction of exotic competitors and predators such as the cat and black rat (*Rattus rattus*) are also crucial factors. In addition to these extinctions, several Christmas Island species, including the red-tailed tropicbird (*Phaethon rubricauda*), are under particular threat from cat predation. A case in point is the red-tailed tropicbird colony along the shoreline of the island population centre, known as The Settlement.



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Main Christmas Island coastline.
Photo – Alex Steffe/Lochman Transparencies
Inset left *Domestic cat.*
Photo – Jiri Lochman
Inset right Black rat.
Inset bottom A red-tailed tropicbird.

Above right A red-tailed tropicbird in flight.

Below The site of the red-tailed tropicbird colony along The Settlement shoreline.
Photos – Neil Hamilton/DEC

History of cats on the island

Since being taken to Christmas Island during European settlement in 1888, cats have gone feral and now abound across the island. There is also a domestic and abundant stray cat population within the residential area. With the impact of cats and also rats on the biodiversity of Christmas Island recognised as a significant concern to land management agencies and the broader community in recent years, a *Management plan for cats and black rats*

Right Red-tailed tropicbird chick.
Photo – Neil Hamilton/DEC

Below right A domestic cat, identifiable by its collar, photographed preying on a red-tailed tropicbird chick in its nest.
Photo – Parks Australia

on Christmas Island was developed to mitigate their effects across all land tenures (shire-managed lands, Crown land, mine leases and Christmas Island National Park). It was adopted in 2010. The plan contained a strategy that provided a staged approach to cat and black rat management, leading to the eradication of one or both species. It aimed to eradicate cats entirely from the island as the de-sexed domestic population dies out. This was based on four actions: firstly to conduct a veterinary program to de-sex, micro-chip and register all domestic cats; secondly to destroy all non-domestic (that is stray and feral) cats; thirdly to establish a 'cat prohibited area' along The Settlement shoreline including the red-tailed tropicbird colonies; and, finally, to prohibit the importation of new cats. Cat registration was an essential first stage to two of these outcomes as it would ensure the release rather than destruction of domestic cats during trapping campaigns for stray and feral cats and ensure the de-sexing of all domestic cats.

Cat control

By the end of the de-sexing program conducted in October 2010, 136 domestic cats from throughout the residential area had been registered. Thirty-five of these domestic cats (20 males, 15 females) were registered in the area around the red-tailed tropicbird colonies along The Settlement shoreline. A further four cats were euthanased because they were unwanted pets. From October 2010 to April 2011 (the breeding season for the red-tailed tropicbird), 11 of the 35 domestic cats (31 per cent) had either died from natural causes or road fatalities or were destroyed because the owners had moved off the island. A further eight stray/feral cats were trapped in the area and destroyed.

Left A feral cat on Christmas Island.

Centre left A trapped black rat.

Below left An adult red-tailed tropic bird and its chick nesting.
Photos – Neil Hamilton/DEC

Red-tailed tropicbirds and cats

Surveys of red-tailed tropicbird nests have been conducted along the shoreline adjacent to The Settlement for a number of years. Before the cat control program was started in 2010, poor nesting success had been recorded for five years, with predation on the eggs and nestlings believed to be the primary cause. During a study of the tropicbirds in 2006, 41 of 42 chicks were thought to have been predated by cats and the subsequent use of remote cameras has provided irrefutable evidence that cats are indeed the culprits. Red-tailed tropicbird nestlings are preyed on by stray and domestic cats. In July and September 2011, surveys of red-tailed tropicbird nests were conducted. One hundred and sixty-one nests were found during these surveys—130 during the first survey and 31 during the second survey. Twenty-one (16 per cent) of nests failed. Of these, five egg failures were observed (broken or addled) and five other eggs were not found during the second survey and were either predated as eggs (possibly by rats) or subsequently as chicks. Eleven nests with downy chicks during the first survey appeared to have been predated. Two nests observed during the first survey were not revisited and therefore their fate remains unknown.

The 54 pre-fledge chicks observed during the first survey appeared to have fledged by the second survey. While 100 per cent fledging success is unlikely, the absence of any bodies indicates a high level of success nonetheless. Applying the predation rate of 8.5 per cent experienced by downy chicks, the lowest estimate of fledglings produced is 40. An additional 38 chicks grew to pre-fledgling age between the two surveys and, combined with 14 nests discovered during the second survey, a total of 52 pre-fledge chicks remain. This equates to 106 pre-fledgling chicks produced from all nests—a 65.8 per cent nesting success.

The future

These results are very encouraging and it is anticipated that nesting success of the red-tailed tropicbirds will continue to improve with successful reduction of cats through the management program. Domestic cats will continue to be present for a number of years until they die out. However, implementation of education programs to provide greater awareness of responsible cat ownership and enforcement of fines for domestic cats trapped in the colonies will further reduce the impact of cats on the red-tailed tropicbird. It would not

be sufficient to keep the cats inside just during the night, as red-tailed tropicbirds leave the nest during the day to feed, leaving the chicks vulnerable. In addition, control of black rats has started along The Settlement shoreline, which should significantly reduce egg predation.

Elsewhere in the world, major and rapid success on seabird recovery following the control of cats has been shown on a number of islands. On Ascension Island, in the South Atlantic Ocean, for example, a 48.8 per cent increase in the sooty tern (*Onychoprion fuscata*) population was recorded in the first year following cat eradication. Also on Natividad Island, in the Pacific Ocean, a 90 per cent decrease in black-vented shearwater (*Puffinus opisthomelas*) mortality was documented soon after cat eradication. On Tasman Island (south-east of Tasmania) the activity of fairy prions (*Pachyptila turtur*) visiting breeding caves increased twofold one year after cat eradication. These, and the results on Christmas Island, prove that great improvements to conservation can be achieved with some persistence, long-term planning and community and organisation support.

Above The southern end of Christmas Island.

Below The Settlement.
Photos – Neil Hamilton/DEC

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