



Do bellbirds have a hidden immunity against exotic predators?

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THE SETTING

The introduction of predatory mammals such as rats, cats and stoats to Aotearoa has led to the extinction of many native birds. The impact of exotic predators has been so profound because native birds evolved over millions of years in their absence, and they appear naïve towards these newly introduced mammals. Birds exhibit behaviours and life history traits (e.g. tameness, loss of flight) that make them especially vulnerable to exotic predators, suggesting they are evolutionarily 'trapped'. But not all birds trapped by history are necessarily doomed to extinction, if they can rapidly adjust their behaviours or evolve in response to exotic predators.

THE CHALLENGE

Are bellbirds doomed to extinction, or are they able to outwit the exotic predators? Find out in Survivor Aotearoa!

THE TRIBES



The bellbirds are a medium-sized honeyeater native to Aotearoa. The abundance and range of bellbirds have declined since human settlement. They appear to have lost strategies to avoid predators.

The exotic predators have many members in their tribe (e.g. stoats, ferrets, rats). Since their introduction to Aotearoa, they have caused the extinction of many birds (e.g. huia, piopio).

THE TACTICS

Bellbirds were studied at three sites with varying predation risk:

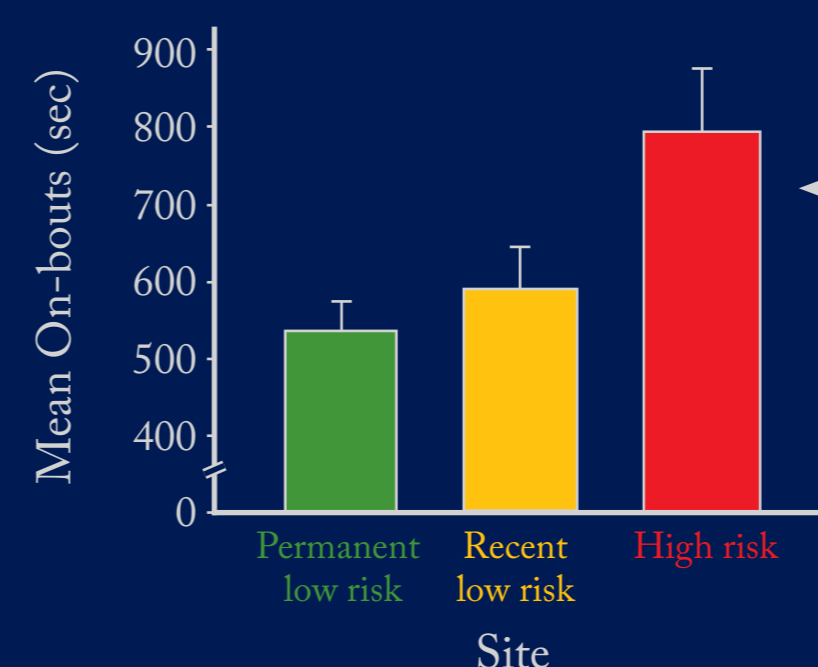
1. **A permanent low risk site** on an offshore island where exotic predators have never been introduced (Aorangi Island).
2. **A recent low risk site** on the mainland where exotic predators were experimentally removed (Waimangarara Bush).
3. **A high risk site** on the mainland with exotic predators present (Kowhai Bush).

Hidden video cameras were used to film parental behaviour of bellbirds at their nest. Videos were scored for number of parental visits to the nest, for how long females incubated their eggs (on-bout) and for how long females foraged away from the nest (off-bout).



DISCOVERING THE Hidden Immunity

Figure 1.
Duration of incubation on-bouts

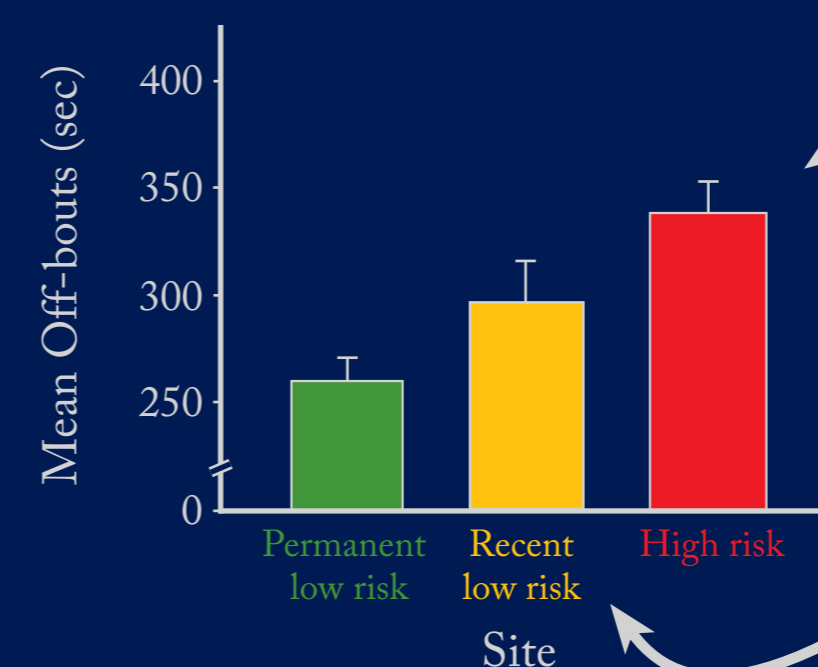


It was discovered that bellbirds nesting in areas with exotic predators have longer on-bouts...

... and also longer off-bouts.

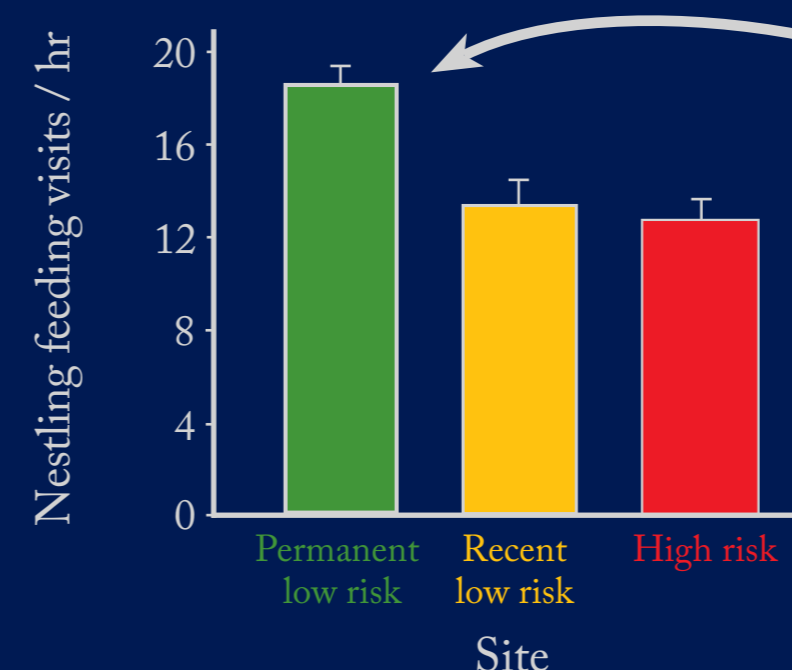
This strategy minimises activity at the nest and reduces the risk of an exotic predator locating and eating the eggs.

Figure 2.
Duration of foraging off-bouts



It appears that bellbirds assess current predation risk.

Figure 3.
Number of visits to feed nestlings



During the nestling period parents fed their chicks less frequently at sites with high predation risk.

This further reduces the risk of an exotic predator destroying the nest.

FINAL TRIBAL COUNCIL

Native bellbirds have a hidden immunity against exotic predators. They are not evolutionarily 'trapped', but, in fact, are capable of changing their nesting behaviours, and so are able to outwit their enemies, the exotic predators.

ON THE NEXT EPISODE OF SURVIVOR

Are other island birds able to outwit the exotic predators? Join Melanie on a Virtual Field Trip to "Ancient New Zealand" via www.learnz.org.nz*

* Curriculum resources free to all New Zealand schools.

CREDITS

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