

KAKA

A Threatened Species?

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Kaka in an aviary were fed the larvae of kanuka longhorn beetles so we could measure how much energy they gained from them. Although the larvae are rich in fats, the effort required by kaka to dig them out means that the net gain of energy is negligible. Photo: Peter Wilson.

An inordinate amount of energy goes into digging out larvae. A male kaka (right) digs kanuka longhorn beetle larvae out of mountain beech trees, taking it on average 81 minutes of hard work peeling off strips of wood (left).

Photos: Ian Southey, Peter Wilson

Scientists are worried that South Island kaka are not breeding successfully. An intensive four-year study on kaka in the Nelson Lakes region found only three nests, and the eggs in all three failed to hatch. A separate study on birds in South Westland also found that the kaka there were not breeding.

The kaka is a forest-dwelling parrot. It is closely related to the alpine kea, although it is not seen as often as the kea because it spends most of its time in the tops of trees. There are two subspecies, the North Island kaka and the larger, more brightly coloured, South Island kaka. At the time of the arrival of European settlers in New Zealand there were accounts of large flocks of kaka throughout much of the country. Indeed, Buller in 1888 reported that the kaka was one of New Zealand's "... characteristic forms and is met with, more or less, in every part of the country."

Today, kaka live only in the larger remaining forests, and in most of these areas they survive only in low numbers. Why did the number of kaka decline so dramatically, and how secure is their future? To try and find the answers, our DSIR Ecology Division research team studied the kaka in beech forests of the Nelson Lakes region.

The destruction of forest habitat is one obvious reason for the reduced distribution of kaka, but we wanted to find out how well kaka were surviving in the areas where the forest is still intact. It would be a great shame if kaka were to become yet another species restricted to a few offshore islands or remote forests most New Zealanders will never see.

Difficult to Study

Kaka are difficult to study, as they live in the tops of trees and often move large distances. It was obvious that we would need a fairly sophisticated technique to locate and follow these birds, so with help from Brian Karl of Ecology Division we developed a method for attaching a miniature radio transmitter that would withstand the powerful "bolt cutters" the kaka has for a beak. The transmitters were held on by a harness system, like a small daypack, and a weak link was built in so that the transmitters would eventually fall off.

Kaka spend a lot of time collecting insects, from both dead and live trees. Male kaka can spend up to two hours digging into the live wood of a mountain beech to capture one larva of the kanuka longhorn beetle. This larva looks very similar to the huhu grub, and is rich in fats and protein. However, the kaka uses so much energy to dig the larva out that not enough energy is gained from eating it to meet the bird's daily requirements. For energy, the kaka must supplement the insects with a richer, more easily accessible food.

There are many anecdotal accounts of kaka feeding on fruits and nectar, but both these food sources are scarce in northern South Island beech forests. Instead, the kaka we studied fed on drops of honeydew. This is a sugary substance produced by a small scale insect which lives in the bark of some beech trees. The honeydew drops have a high energy content but a low protein content, so by themselves they are not a balanced diet. However, when the energy from honeydew is combined with the protein and minerals from insects, kaka have a diet that allows them to survive in beech forests.

Kaka feed on honeydew mainly in the late afternoon and early morning. This helps them to survive through the night, and to gain energy quickly in the morning before they head off to start digging out insects. Kaka collect most of their honeydew from branches in the tree canopy. Experiments have shown that the sugar concentration in droplets from the canopy level is higher than in droplets lower down the tree.

We needed to find the answers to three questions before we could calculate how much energy the kaka would get from feeding on honeydew:

- How fast can kaka collect drops of honeydew?
- What is the average energy value of a drop of honeydew?
- How much energy does a kaka use up in collecting honeydew?

We found that kaka could collect about three drops of honeydew every second. Each droplet had an energy value of about 11 joules. From this we estimated a kaka would only need to feed on honeydew for about three hours to get enough energy to

