

SHORT NOTE

Scavenging behaviour of kea (*Nestor notabilis*)

RAOUL SCHWING*

School of Biological Sciences, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

Kea (Psittaciformes: *Nestor notabilis*) are endemic to the alpine regions of New Zealand. In contrast with most other parrot species, they are omnivorous (Clarke 1970; Brejaart 1988; Higgins 1999; Lill 2009) and opportunistic when presented with new feeding opportunities. In addition to feeding on plants and insects (Clarke 1970; Brejaart 1988), kea have also been reported feeding on Hutton's shearwater (*Puffinus huttoni*) chicks and eggs (Temple 1996; Harrow 1976), mice (*Mus musculus*; Beggs and Mankelov 2002), and domesticated sheep (*Ovis aries*; Marriner 1908). The only published accounts of kea feeding on carrion have reported both red deer (*Cervus elaphus nelsoni*; Edgar 1974) and possum (*Trichosurus vulpecula*, Diamond & Bond 1999).

In early Dec 2009, I observed a group of kea in and around Aoraki/Mt Cook National Park scavenging 2 carcasses of Himalayan thar (*Hemitragus jemlahicus*). At ~1800 h on 3 Dec, a juvenile kea was observed moving near an animal carcass on the scree slopes of Birch Hill Stream Valley at an elevation of ~1300 m. The carcass was later identified as a Himalayan thar (henceforth T1). Upon further investigation, a second thar carcass (T2) was found close by at an elevation of ~1250 m. The second carcass showed signs of scavenging by kea. The close proximity of the carcasses, and their general state (flesh stripped from the thighs and rump, head of large male removed as a trophy), suggests that they were killed by hunters (J. Kemp, *pers. comm*). Further

entry wounds from scavenging at the points of bone fractures in the extremities, behind the shoulder blades, and in the connective tissue between the front leg and torso were visible. The neck region had also been stripped of muscle and there were no visible entrails left. A third thar (T3) was spotted in close proximity to T1, but both were inaccessible behind avalanche debris. Using a video camera with 40x zoom, T1 and T3 were inspected from a distance of 50 m. T1 was in a similar condition to T2, although the head was still intact, while T3 was stripped of all tissue, leaving only patches of wool on the skeleton.

Later the same evening, 2 juvenile kea were filmed scavenging T1, confirming that some of the damage to T1 was caused by kea. The kea fed from the exposed areas around the extremities, hips and neck, and from a cavity in the gut region. With fading light, more kea arrived to feed on T2. All age classes (Schmidt 1971; Keller 1972; Mallet 1973) were present (2 adults, 3 sub-adults, 5 juveniles, 2 fledglings), with up to 5 birds feeding on either carcass at any one time. The following evening (4 Dec), a smaller group of birds (1 adult, 1 sub-adult, 1 juvenile, 4 fledglings) containing some of the same individuals seen the day before (identified based on leg bands), returned to feed on the thar carcasses. The adult and sub-adult birds seemed more adept at exploiting the thar and were more focused on feeding than younger birds. Juveniles, besides feeding, spent time in agonistic displays, played, and were interested in nearby human activity. Fledglings stayed close to the adults, and although

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*Correspondence: rsch085@aucklanduni.co.nz

they fed on thar, they did not do so for prolonged periods. Fledglings watched the adults feed, and once the adults had left the carcass they followed them and performed begging behaviour. Although up to 4 fledglings were seen begging from the same adult, none were observed being fed by more than one adult. Most feeding at the thar carcasses happened without any displacement or other agonistic behaviour despite the mix of ages. The agonistic behaviour that did occur was performed some distance away, and only occasionally on or near the carcasses. The birds involved were all juveniles, and no display seemed to end in the victor claiming the carcass and feeding on it.

Five kea were caught for banding (2 sub-adults, 2 juveniles and a fledgling) during the observation period and all showed signs of feeding on thar. The head and chest of the 2 sub-adults were covered in blood, they had pieces of flesh on their beaks, and a crop full of meat. The fledgling also had a full crop, but had been observed previously being fed by one of the adult birds. The juveniles and the fledgling had signs of feeding (blood) on their beaks and plumage, but to a lesser extent.

My observations of the presence of different age classes at the thar carcasses suggests that scavenging could be a learned behaviour in kea. Adults were observed scavenging to a greater extent than young kea, but the social interactions observed at the carcasses could function in the development of foraging skills in juvenile birds. This was first suggested by Diamond and Bond (1991) when foraging success was documented at a refuse dump. They found significant differences between the age groups, with older birds much more efficient and involved, pointing towards the learned aspect of the behaviour.

This is the first published description of kea feeding on thar carcasses, although it has been observed previously (P. van Klink, *pers. comm.*). It may be that scavenging is a recently acquired behaviour because large mammals were absent from New Zealand before human colonisation. However, before the arrival of humans, large birds such as the moa (Dinornithiformes) or kakapo (*Strigops habroptila*) could have provided a source of carrion. Although the prime scavenger at the time would likely have been the New Zealand raven (*Corvus antipodum*; Holdaway 1989), the kea's range within the South Island was perhaps more extensive and given their large size, one would not expect kea to be excluded completely from carcasses through competition with ravens. Evidence of scavenging on moa bones by either kea or eagle has been found in the fossil record (Worthy and Holdaway, 1996).

Together with early accounts of scavenging, it suggests that many types of carcasses are used by kea, and that carrion could be a larger part of their diet than previously thought.

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