Olfaction in Accipitrid vultures

Martin Gilbert & Song Chansocheat

The importance of olfactory cues in locating decaying carcasses has been well documented in several species of Cathartid vulture (Stager 1964, Houston 1984, 1986, Gomez et al. 1994). By contrast, Old World vulture species are thought to make little or no use of smell when locating sources of food. The observations described here suggest that Acciptirid vultures may be able to utilize olfactory cues, at least at close range, in the detection of hidden carcasses.

The Cambodian Vulture Conservation Project is a collaborative initiative between the Wildlife Conservation Society (WCS) Cambodia Programme, BirdLife International and World Wide Fund for Nature. The project seeks to monitor and conserve remaining vulture populations in northern and eastern Cambodia through supplementary feeding, location and protection of nesting sites, capture-mark-recapture, ranging studies using satellite telemetry and measures to prevent the introduction of veterinary diclofenac. The observations described here were made in March 2005 in northern Cambodia during an expedition to capture, mark and release vultures in the Siem Pang district, Stung Treng province.

A clearing in the dry dipterocarp forest approximately one kilometre from a regular feeding site was selected for trapping. During preparations on 2 March, local villagers reported the sudden death of an adult cow, the carcass of which was brought to the trap site for potential use as bait. However, as it was not possible to exclude anthrax as the cause of the animal's death, it was decided on safety grounds that the carcass should be buried at the site to prevent scavenging and release of hazardous spores. Attempts to trap commenced the same day using a freshly slaughtered cow and a remotely operated Q-net (Fuhrman Diversified Inc.).

Vultures were not observed at the site until 4 March, when several Red-headed *Sarcogyps calvus* and White-rumped Vultures *Gyps bengalensis* were seen in flight overhead and some perched in the vicinity. Due to limited visibility from the blinds, it was not possible to obtain accurate counts, but by 10h00 on 5 March 30–40 vultures were thought to be present, including several Slender-billed Vultures *G. tenuirostris*. At 15h15 a Large-billed Crow *Corvus macrorhynchos* was the first bird to land and approach the carcass to feed. Fifteen minutes later three Red-headed, two Slender-billed and two White-rumped Vultures descended to the ground. These birds refused to approach the bait, instead

retreating to the disturbed ground where the dead cow had been buried, some 25 m away. These birds used their feet to excavate the buried cow which the two Slender-billed Vultures repeatedly fought over and defended. Despite being buried at a depth in excess of 30 cm, at least one Red-headed Vulture was observed to feed before the birds departed to roost at 17h30.

Satellite telemetry and observations of marked birds have shown that vultures in Cambodia utilize artificial restaurant sites at widely separated locations. As the Q-net had previously been deployed on three separate occasions in Chhep district, Preah Vihear province (a distance of approximately 100 km), it was likely that at least some of the Siem Pang vultures had encountered the trap before and might have explained the difficulties in attracting the birds to the bait.

Given that the bait did not attract vultures until the third day it seems unlikely that any vultures were unnoticed and had observed the carcass being buried. Furthermore, in the absence of any cultural precedent for burying carcasses it seems unlikely that the vultures were able to locate the buried cow using prior experience. Consequently, the most likely explanation for the vultures' rapid and accurate location of the hidden food source once on the ground would be a fine sense of deduction and a keen sense of smell.

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Authors' address: Wildlife Conservation Society – Cambodia, House 21, Street 21 (Tonle Bassac), P.O. Box 1620, Phnom Penh, Cambodia. E-mail address: mgilbert@wcs.org