method is as follows: the hawk glides back and forth along a path perhaps 300 m long. Suddenly it changes gear and rows rapidly after a bat about 30 m away. It attacks from the rear and usually from a slightly higher level. The crucial point is that the bat seems unaware of the approach and is caught effortlessly with an audible "slap". I have yet to see any sign of a chase and the prey is quickly consumed in flight.

Occasionally, a fairly large bat is caught and then apparently released. Larger bats seem to be ignored. It seems that the Bat Hawk's best foraging strategy is to hunt small bats because within the limited time available it is not profitable to dismember and consume large ones. Not only are smaller bats usually more abundant, but they can also be swallowed in seconds. That larger bats are released supports both this proposal and the suggestion that the prey is not difficult to catch.

The best catch rate that I have measured was for an immature Bat Hawk, hawking bats over the Luangwa River. It caught and ate 5 bats in 5 minutes. Rates of this order of magnitude are not exceptional where small bats are abundant. On another occasion, I saw a Bat Hawk employ a different method of hunting: the time was 17h40 on September 9, 1986, before bats were out flying. The Bat Hawk flew very slowly around a grove of Albizia harveyi, almost touching the canopy branches as it peered among them looking for bats. Small numbers of bats regularly roosted in these trees, but no prey were caught or flushed.

In sum my observations suggest that Bat Hawks require only speed, not agility in capturing their main prey, and this may explain why they exhibit a marked lack of dimorphism compared with other raptors taking "agile" prey.

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Comments on RSD and the agility of the Bat Hawk by J Auburn

JOHN MENDELSOHN

Mr. Auburn's observations certainly support the idea that bats are not hard to catch. Similar reports of bats being caught very rapidly are provided by Black, Howard & Stjernstedt (1979, Biotropica 11:18-21). They saw 37 bats being caught at an
FORUM  We encourage commentaries, opinions, new ideas or constructive criticisms of anything to do with African raptor research. Contributions must be concise.

RSD and the agility of the Bat Hawk

J. AUBURN

Having read Dr JM Mendelssohn's article on Reversed Size Dimorphism (RSD) in raptors (GABAR 1:22-26), I wish to suggest that the diet of the Bat Hawk Machieramphus alcinus is no exception to his thesis that the agility of prey is a strong selective force in the evolution of RSD. (Bat Hawks catch apparently agile prey, yet do not exhibit the expected degree of dimorphism.) Prey species in the diet may be agile, but will only be difficult to catch if they detect the predator's approach and take evasive action. In my experience, this probably happens rarely with bats and Bat Hawks. Furthermore, hunting success (below) is likely to be good enough such that females have no need to store body reserves by remaining inactive. Both sexes, being of similar size, should also be equally adept at catching the commonest bats - small ones.

Over the last 10 years I have recorded Bat Hawks in Zambia on 82 days. On 59 occasions I have observed one or two birds actually hunting bats, usually at dusk but twice at dawn. Invariably, whenever conditions allowed me to follow the pursuit of a particular bat, it was seen to be caught. The normal hunting

Fig. 1. Immature Bat Hawk photographed by Warwick Tarboton. ©

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average rate of one bat per 2.97 min of flight. They also cite a report by Eccles et al. (1969. Ostrich 40:26-27) of 7 bats being caught at a rate of one bat every 2.86 min. The real question is: how often do Bat Hawks feed so efficiently?

The many records of them feeding on birds (such as swallows and swifts, which are probably difficult to catch and require a good degree of agility in flight) suggest that they do not always have such easy pickings. Presumably, they also encounter nights with bad weather on which bats do not emerge and fly in open areas where they are accessible. So, while I agree that bats are probably not as hard to catch as we imagine, Bat Hawks probably often battle to meet their daily food requirements. Given this and the likelihood of a restricted amount of time for foraging each night, I still predict that one parent cannot provide sufficient food for its mate and young. Even if this idea is wrong, I hope it will stimulate someone to find out more about this fascinating raptor and so test the RSD hypothesis.

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One of the few reports that the Bat Hawk is not as an efficient hunter as some impressions give, comes from the observations of TC Ballance in Zimbabwe (Honeyguide 10:29-30). These winter observations show that the Hawk killed 17 bats in one evening (by swooping up from behind) and generally swallowed them within 15 sec. On the second evening the hawk killed 12 bats, killed another but dropped it, and missed 9 more - all in 15 minutes. In 5 minutes on the next evening the hawk killed 3 bats and missed 4. In all the Bat Hawk killed and ate 15 bats and missed or dropped another 14 - a success rate of only 52%. It is possible that the bird observed was inexperienced, but more observations are needed before generalisations can be made about the efficiency of Bat Hawk hunting. - Ed.
Debus (1986) has proposed that three species of eagles, *Hieraaetus pennatus* (Booted Eagle), *H. morphnoides* (Little Eagle) and *H. wahlbergi* (Wahlberg's Eagle) form a superspecies. The latter, Wahlberg's Eagle, has often been placed in the genus Aquila, as I did in a recent paper on the systematics of these and allied eagles (Amadon 1982). Now, based on the field observations of Smeenk (1974) and other considerations, I agree on the transfer of *wahlbergi* to the genus *Hieraaetus*. It is, however, somewhat intermediate between the two genera, and the conventional wisdom has been that another African species *H. ayresii* (= *dubius*), Ayre's Hawk Eagle, is closer to the Booted Eagle, Little Eagle and probably the Chestnut-bellied Hawk Eagle (*H. kienerii*) than is Wahlberg's.

In Africa, the situation is complicated with Wahlberg's (Fig. 1) and Ayre's overlapping in range (sympatric), while the Booted Eagle has rather recently been found to breed in South Africa. It may be more prudent for now to place all these small species of *Hieraaetus* in a species group, rather than setting up superspecies. The genus will then contain two other species groups: (1) *H. fasciatus*, Bonelli's Eagle (of Europe), and *H. spilogaster*, the African Hawk Eagle, very closely related and forming a superspecies, and (2) *H. (Polemaetus) bellicosus*, the Martial Eagle of Africa - the present day headquarters of the genus.

**Fig. 1. Adult Wahlberg's Eagle at its nest. © Warwick Tarboton.**

(GABAR 2:18-19, 1987)