

Feather Fascination!

with local Birdwatcher,

Jim Butler

BALANCING ENERGY

THE Nankeen Kestrel is the smallest Australian daytime raptor (length 32 cm, wingspan 70 cm, mass 130 g) and its diet is mostly mice and lizards. Kestrels are found in grasslands and farmlands throughout Australia. Optimal foraging theory predicts that, in response to external factors, raptors will select those hunting

strategies which capture the most prey with the least energy. Therefore, researchers have studied how kestrels adapt to changing weather conditions and prey availability, two key external factors.

Kestrels—hunting for prey with piercing eyes in still heads—can either hover or perch. Hovering involves the Kestrel flying continuously with short hovering bouts; this strategy involves high energy expenditure. By contrast, in the perching strategy the Kestrel perches until it sees prey and then launches into flight. Hovering flights expend 24 times more energy than perching; but the former is more time-efficient. Researchers have found that Kestrels mostly hunt from perches in the morning and near sunset; and use hovering flights during the day. High energy hovering is used when higher wind speed and air temperature are the important weather variables. The increased lift-force caused by higher winds helps Kestrels to fly and hover with less reliance on wing beats, thus conserving energy but making hunting more efficient.

The choice of hunting strategy will also be mediated by the activity pattern of the prey which is highly determined by air temperature. In the morning cold, prey are less active and subsequently more difficult to hunt, so Kestrels adopt a perching strategy to save energy costs. As the day progresses and gets warmer, prey become more active and consequently easier to detect, triggering a change of strategy to active hunting, which requires more energy per time unit but requires less time to encounter prey. And, the hovering strategy energy expenditure would decline as wind speed increases during the day. The strategy is to keep the chemical energy expended hunting, less than the food energy gained for the Kestrel itself and the young!

Foraging involves complex life/death choices

— Jim

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Image: Nankeen Kestrel
by Tom Tarrant

