cold COMFORT

THE SECRET LIFE OF AFRICAN SCOPS-OWLS

Text by Ben Smit & Andrew McKechnie

Radio-tracking owls near a vulture restaurant on a midwinter's night in the Kalahari is not as much fun as it may sound. By 3 a.m., the temperature is -5 °C and dropping, the caffeine from the cup of coffee you had two hours ago has long worn off, and the neurons of your sleep-deprived brain are firing much too slowly to work out a comfortable sleeping position in the front seat of a pick-up truck.

During the intervals between data-recording sessions, the only indication that time is not, in fact, standing still is the layer of ice becoming progressively thicker on the vehicle's roof. When you do eventually fall into a cramped, restless sleep, you are soon jolted back to frozen reality by the none-too-subtle aroma of a week-old zebra carcass. Every rustle around the carcass, every sound of a bone being crunched, and every carnivore eye reflected in the moonlight causes your imagination to run wild.

Some consolation for your prolonged discomfort is offered by the infinite number of stars glistening overhead, the moon rising majestically between the branches of a dead tree, and the faint *beep…beep…beep* that your telemetry receiver emits every time you stagger out of the vehicle and point the antenna into the darkness. Somewhere among the ghostly grey camel thorns, an African Scops-Owl is foraging for the slim pickings a cold desert night has to offer, and the miniature transmitter affixed to it is providing new insights into the ecology and physiology of this charming but secretive little bird.

African Scops-Owl WARWICK TARBOTON

SHEM COMPION

African Scops-Owls feed predominantly on insects, but also include scorpions, spiders, and other arthropods in their diet.

WARWICK TARBOTON (2)

The African Scops-Owl *Otus senegalensis* is the smallest owl in southern Africa. Widespread in sub-Saharan savannas, it is particularly common in parkland dotted with large trees. However, when not proclaiming its presence vocally, this species' secretive roosting behaviour and nocturnal habits mean that it is often overlooked by all but the most dedicated observers. Globally, scops-owls are the most species-rich group of owls, with a remarkable 20 per cent of the world's 222 owl species belonging to the genus *Otus*. This diverse group occurs throughout the Old World, with the exception of Australasia, where it is replaced by the ecologically similar but more distantly related owlet-nightjars. In the Americas, 26 species of screech-owls were formerly considered part of the *Otus* genus, but they have recently been re-classified as *Megascops*.

Scops- and screech-owls are small, feed mostly on invertebrates (including scorpions), and have highly cryptic plumage coloration. They occupy a remarkably wide variety of habitats, from the tropical rainforests of South-East Asia to cool, high-altitude coniferous forest in North America, as well as the savannas of Africa and the stony deserts of the Middle East. Most species spend the day roosting in trees, but a few, such as the Pallid Scops-Owl *O. brucei* of the Middle East, roost on the ground on steep, rocky slopes. One of the most remarkable aspects of the scops-owls' global distribution concerns their diversity on Indian Ocean islands, where almost every archipelago has an endemic species. In the past decade, a new and highly distinct species restricted to Sri Lanka, the Serindib Scops-Owl *O. thilohoffmanni* has been described, and the number of known species may well increase further.

During 2007 and in early 2008, we studied the physiology and ecology of African Scops-Owls and Pearl-spotted Owlets in the Molopo Nature Reserve in North West Province. Falling within the Kalahari Desert biome, Molopo's undulating plains of dry shrub savanna, dotted with camel thorns and magnificent *Boscia*

ROBYN BRUYNS

By radio-tracking owls around the clock, we obtained new insights into their behaviour and patterns of thermoregulation.

albitrunca trees, provide superb habitat for these two owls, as well as a host of Kalahari endemics. By attaching tiny, temperature-sensitive radio transmitters to several owls of each species, we obtained fascinating insights into how they cope physiologically with the harsh desert environment, and were afforded unparalleled opportunities to track and observe them at night.

Differences in behaviour between these two owl species were dramatically illustrated in their interactions with other birds. A Pearl-spotted Owlet perched in the upper branches of a camel thorn late in the afternoon would often ensure top-class birding entertainment. The owlet's piercing whistles invariably attracted a commando of small birds, more often than not with a vanguard of shrieking Scaly-feathered Finches fluttering in a thorny tangle of branches a few metres below the pearlie. Within minutes, Crimson-breasted Shrikes, Fork-tailed Drongos and White-browed Sparrow-Weavers would join the protest. On several occasions, scops-owls that we were tracking would remain motionless in the midst of the chaos, undetected by the mobbing birds. Only after the harassed pearlie headed for more peaceful hunting grounds, the twittering of the finches had died down and calm was restored to the camel thorn, would

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a pair of yellow eyes appear against a branch within the tree's canopy. On such occasions, scops-owls were apparently unfazed by the frantic activity of the mobbers, and the latter were completely oblivious to the little owl's close proximity.

The distinctive *prrrup* of African Scops-Owls belongs as much to humid lowveld evenings after summer thunderstorms as it does to cold, cloudless Kalahari nights. In prime scops-owl habitat, an observer will often hear the calls of a multitude of individuals at regular intervals from many points of the compass. A scops-owl usually perches in a favourite tree, and may remain there for hours on end 'chatting' with a mate or neighbouring territory-holder. Their calls, produced at intervals of about five seconds, are used to keep in contact with mates, as well as to audibly proclaim territories.

To human ears, the call of the African Scops-Owl is highly ventriloquial: the direction of the call's source can be difficult to pinpoint and scops-owls often sound much closer than they really are. On a quiet, windless night, a male scops-owl can be heard from almost a kilometre away. The calls of males and females differ in pitch and, when both birds are calling, the female is easily distinguished by her slightly higher pitched vocalisations. Another fairly loud, single-noted call, heard less often and which seems to be used mostly by females, sounds like the low squeak of a bicycle pump: *puet*, with a similar calling interval to the usual call.

Scops-owl vocalisations can be seasonal. In June 2007, when the owls in Molopo suddenly became silent and stopped responding to imitations of their calls, just as we were about to start data collection, our initial thought was that they had moved out of the area for the winter. However, after several bitterly cold nights of intensive searching, we discovered that they were still there, but at lower densities and very reluctant to call. Throughout June and July, they kept a low profile, in contrast to the Pearl-spotted Owlets, which remained extremely vocal and active in this period, particularly during daylight hours.

In mid-August, as daytime temperatures began to climb, the Kalahari's nocturnal sounds changed once again. We heard the *tek-tek-tek* clicks of barking geckos, and the scops-owls began proclaiming their territories once more, this time in preparation for breeding. In Molopo, a pair of African Scops-Owls typically defends a territory of about 30 hectares year-round. In summer, from around January, the number of individuals calling in each territory increases as the youngsters that hatched between September and November add to the nocturnal symphony. By April, Molopo nights literally reverberate with scops-owl calls.

Pearl-spotted Owlets, unlike the more secretive and completely nocturnal scops-owls, are frequently conspicuous and active during the day.

ALBERT FRONEMAN

Highly cryptic while roosting during the day, African Scops-Owls reduce their energy requirements by entering shallow torpor.

African Scops-Owls usually spend the first few hours after sunset actively foraging for insects, spiders and scorpions. Foraging techniques are diverse, allowing the owls to consume a wide variety of prey. They swoop after aerial or terrestrial quarry in a manner reminiscent of Fork-tailed Drongos, glean insects and spiders from tree canopies much like warblers, and even walk and hop on the ground searching for hidden prey like a Crimson-breasted Shrike.

During the cold, dry Kalahari winter, a closer look at the bristles and feathers around the beaks of the scops-owls we handled in Molopo revealed an intriguing feeding behaviour. Their faces and beaks were covered in fresh herbivore dung (probably that of wildebeest, zebra or various antelope species), suggesting that they search among dung middens for insect larvae or pupae. The notion of an owl scratching around in a dung pile might seem somewhat bizarre, but very few insects are active on cold winter nights and nutrient-rich dung will in all likelihood be one of the most reliable places to find prey.

Just after sunrise on cold Kalahari mornings, the body temperatures of scops-owls that had recently returned to their daytime roosts would gradually drop about 10 degrees below normal levels

Our study's major question, however, concerned what scops-owls do during the day, when they are not foraging, calling or engaging in any other activity. Unlike nightjars and their allies, owls as a group do not appear to use torpor, an energy-saving strategy during which metabolic rate and body temperature are reduced far below normal levels (see *Africa – Birds & Birding* 10(4): 14). Several owls from cold northern climates, ranging in size from the small Tengmalm's Owl *Aegolius funereus* to the massive Snowy Owl *Nyctea scandiaca*, have been investigated, but none exhibited patterns of body temperature remotely like those observed in nightjars, hummingbirds, mousebirds and a few other groups that do use torpor. What these studies have in common, however, is that they all involved captive owls. The physiology of captive birds is often very different to that of wild individuals, and we suspected that finding torpor in this group of birds would require a study of free-ranging owls in a suitable habitat.

Our hunch proved correct. The temperature-sensitive transmitters we attached to the scops-owls in Molopo revealed that this species does indeed use shallow torpor. Just after sunrise on cold Kalahari mornings, the body temperatures of scops-owls that had recently returned to their daytime roosts would gradually drop about 10 degrees below normal levels. These results are intriguing because they reveal that at least one owl species possesses the physiological capacity for torpor. The energy savings associated with this metabolic suppression probably contribute to the scops-owls' ability to survive on invertebrates during winter, since their energy requirements, and thus the number of prey items they have to catch in a night, are reduced.

One of the fascinating aspects of the patterns of torpor we observed in the scops-owls concerned the way in which they re-warmed after each torpor bout. Many birds and small mammals warm up to normal temperatures by rapidly metabolising fats and carbohydrates, producing heat as a by-product of these chemical reactions. The amount of heat generated can be astounding: the metabolic rate of a hummingbird perched motionless on a twig while re-warming from torpor can be similar to when it is hovering in front of a flower, beating its wings tens of times per second.

However, many species reduce the metabolic cost of re-warming by basking in the sun, since solar radiation can substitute for internally produced metabolic heat. Scops-owls appear to be among the species that bask during re-warming. All the individuals in our study re-warmed very slowly after torpor bouts, at less than a quarter of the rate expected for a species this size, a pattern strongly suggestive of sun-basking. We were reluctant to approach trees in which scops-owls were roosting, for fear of disturbing the birds while they were re-warming. On the one occasion when we did so, the owl in question re-warmed more than three times faster than undisturbed birds.

Another surprise was that Pearl-spotted Owlets in Molopo showed no signs whatsoever of using torpor. This observation was unexpected, since the two species are similar in body size and endure the same harsh winter temperatures. We think that the more pronounced diurnal activity of pearlies in winter, and the fact that they include in their diets birds, rodents, and other vertebrates whose availability is less temperature dependent than that of insects, may mean that this species faces less severe energetic stress during the winter months than the scops-owls. □

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