Termite mounds: more than just termites

Termite mounds are home to much more than termites. New studies on Barrow Island Nature Reserve reveal a remarkable suite of creatures who inhabit these towering mounds of earth.

by Dorian Moro and Pat Cullen

Termite mounds are common pinnacles of the northern Australian landscape. These mounds, also referred to as termitaria or 'terrestrial icebergs', are built over time by large colonies of social insects—termites—that act as important miners of the soils. Yet surprisingly little is known about the other wildlife that share mounds with these insects. A recent survey on Barrow Island Nature Reserve provided an insight into the many other—and larger—inhabitants that use these impressive structures.

Termite mounds provide nutrient-rich islands across arid landscapes and support nutrient flow to vegetation. Additionally, they serve as habitat to many species of vertebrate fauna who have adapted to use them for shelter, perches or other needs. However, while most of us only think of termites when we see these large mounds, many different types of invertebrate and vertebrate wildlife species may co-habit these structures. On Barrow Island, recent surveys found that mound-sharing was a common feature for many vertebrate species.

Islands within an island

At 23,400 hectares, Barrow Island is Western Australia's second largest island, and is located off the state's Pilbara coast. It is one of Australia's most important mammal and marine turtle conservation areas. Given its natural significance, the Department of Parks and Wildlife maintains a significant presence on the island, with an office, laboratory and team of fly-in fly-out staff. The island occurs in an arid landscape that reflects what mainland Australia looked like before the island's separation during the last ice age about 8,000 to 10,000 years ago. It supports diverse terrestrial habitats primarily comprising spinifex and coastal vegetation. Termite mounds are a common feature of this island ecosystem and act as natural island-arks for the species that make use of them. Invertebrate surveys by Curtin University and Chevron Australia found 31 species or morphospecies of Isoptera (termites) from two families and eight genera on Barrow Island. However, the large termite mounds are primarily built by the one species, *Nasutitermes triodiae*. The mounds measure up to 2.5 metres high and two metres across.

During approved land clearing operations to facilitate the development of the Chevron-operated Gorgon Gas Project on Barrow Island, dedicated fauna handlers were required to carefully dismantle termite mounds that were to be destroyed and to survey and record the vertebrates living within them.

Species diversity

More than 400 termite mounds were surveyed. However, not all mounds contained vertebrates: fauna were recorded from 66 mounds (16 per cent) of those found in the cleared area. Reptiles were the most common vertebrate fauna sheltering within termite mounds, with 26 species recorded, although four small mammal species were also found.

Species common in termite mounds included the Stimson's python (*Antaresia stimsoni stimsoni*), Pilbara dtella (*Gehyra pilbara*), Bynoe's gecko (*Heteronotia binoei*), rock ctenotus (*Ctenotus saxatilis*) and exquisite fire-tail skink (*Morethia ruficauda exquisita*). Although the Pilbara dtella is a known specialist of termite mounds and seldom found away from them, Bynoe's gecko was the most abundant species

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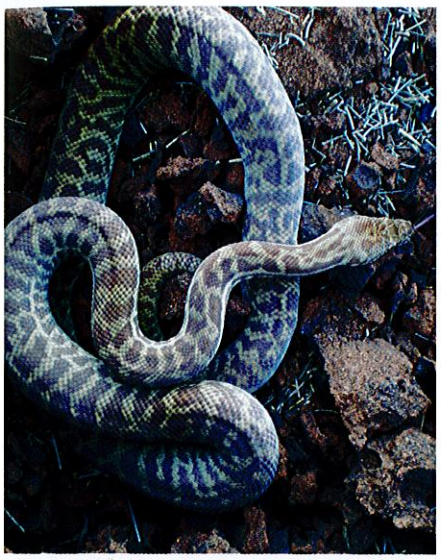
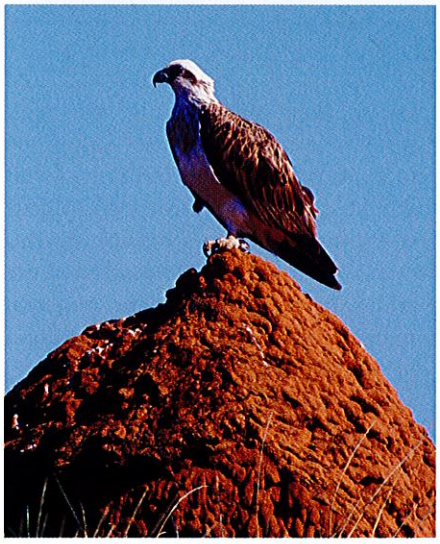
Main Obe's Beach, Barrow Island.
Photo – Marie Lochman
Left inset A euro bounds past a termite mound on Barrow Island.
Photo – Dorian Moro
Right inset Excavating a termite mound on the island.
Photo – Pat Cullen

Left Termite mounds on Barrow Island.
Photo – Dorian Moro





Top left Stimpson's pythons were found to occupy the termite mounds on Barrow Island.

Above Surveying a termite mound on the island.
Photos - Pat Cullen

Above left A termite mound makes a convenient perch for an osprey.
Photo - Jiri Lochman

found to occupy termite mounds on Barrow Island. Interestingly, captures of Bynoe's gecko were higher in mounds on Barrow Island than have been observed from surveys elsewhere in the Pilbara.

Another reptile of interest that was found within the mounds was the perentie (*Varanus giganteus*). This species is a top-level predator on the island and, during the summer months, is often seen patrolling the beaches in search of turtle eggs and hatchlings. Past records from the well-known conservationist and naturalist Dr Harry Butler report that this species uses termite mounds for nesting.

Termite mounds were also favoured by some reptiles more than the surrounding vegetation. For example, four reptile species (the Stimson's python, Pilbara dtella, Bynoe's gecko and exquisite fire-tail skink) were found to occur predominantly in termite mounds, rather than in the surrounding vegetation. In contrast, the rock ctenotus, northern slender blue-tongue (*Cyclodomorphus melanops melanops*), grand ctenotus (*Ctenotus grandis titan*) and sharp-snouted delma (*Delma nasuta*) were better represented in the surrounding vegetation than in termite mounds.

Mammal diversity was limited to some of the smaller mammals known from Barrow Island; the dasyurids Rory's pseudantechinus (*Pseudantechinus roryi*) and common planigale (*Planigale* sp.), Barrow Island golden bandicoot (*Isoodon auratus barrowensis*), and western chestnut mouse (*Pseudomys nanus ferculinus*).

More than shelter

Termite mounds offer large animals more than just shelter; they also provide opportunities for feeding, nesting, perching, sunning, or seeking shade. Reptiles such as the perentie and ring-tail dragon (*Ctenophorus caudicinctus caudicinctus*) can often be observed warming themselves in the morning sun as they spread themselves on the tips of one of these pinnacles. Reptiles will eat a range of invertebrates that termite mounds harbour, such as termites, cockroaches, beetles, or spiders. Termite mounds can also act as incubators for reptile eggs, protecting them from extreme temperature fluctuations that are present outside the shelter of the mound. Finally, termite mounds offer shade opportunities; the Barrow Island

Above Termite mounds on Barrow Island.
Photo - Dorian Moro

Below Turtle Bay on the island.
Photo - Marie Lochman

euro (*Macropus robustus isabellinus*) often uses the shade of termite mounds to rest during the day.

While no birds were found sheltering inside mounds during this survey, birds may also use these structures. Historical records of red-backed kingfisher (*Todiramphus pyrrhopygius*) nesting inside termite mounds are known from the island. Like they do for reptile eggs, termite mounds can also act as incubators for bird eggs. Furthermore, the mounds offer important perching and observation platforms for many raptors and other terrestrial birds in a landscape otherwise devoid of tall vegetation. Birds perching will glean insects, and mound perching is typically observed by the nankeen kestrel (*Falco cenchroides*), osprey (*Pandion cristatus*), brahminy kite (*Haliastur indus*), white-breasted woodswallow (*Artamus leucorynchus*), bar-shouldered dove (*Geopelia humeralis*), spotted harrier (*Circus assimilis*), and white-bellied sea eagle (*Haliaeetus leucogaster*).

Landscape value

Termite mounds are particularly useful as habitat for almost half of the known reptile species occurring on Barrow Island, and they also offer shelter for small mammals in a landscape with limited vegetated cover. Information on which vertebrates live within termite mounds offers environmental managers an insight into the value these mounds have as habitat to wildlife, and the usefulness of these structures as refuges to large fauna during fires or floods.

Large termite mounds act as functionally important habitats to many vertebrate species. The results from this survey highlight the value of retaining termite mounds in other landscapes where fauna, for example rare species, have restricted distributions. Importantly, the high species diversity observed within the mounds on Barrow Island provides an insight into the diversity of habitats that many vertebrates occupy on this island and likely elsewhere across the arid zones of Australia. The potential refuge these mounds offer during flood or following land clearing disturbances such as fire, and the potential opportunities they offer for future local re-colonisation, feeding and nesting, should be acknowledged.

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