Threatened Species of the Northern Territory

YELLOW-SPOTTED MONITOR
NORTHERN SAND GOANNA
FLOODPLAIN MONITOR

Varanus panoptes

Conservation status
Australia: Not listed
Northern Territory: Vulnerable

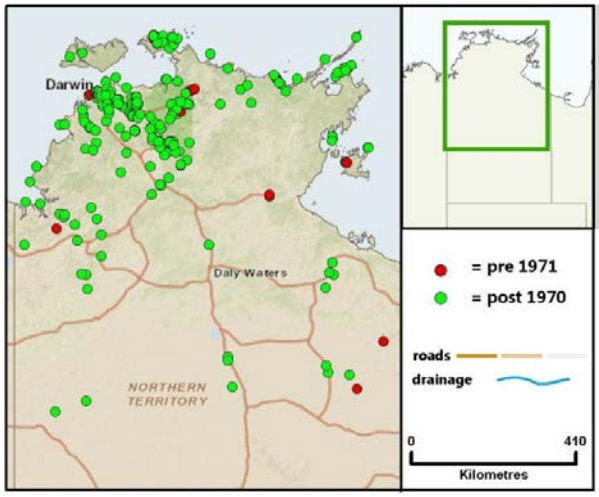
Photo: A.Fisher

Description

The yellow-spotted monitor is a large (total length up to 1.4 m) heavily-built terrestrial monitor, dark brown to reddish-brown on the back with alternating transverse bands of large black spots and smaller dark-edged pale yellow spots. The underside is pale but often marked with lines of spots extending from the pattern on the back. The tail is laterally compressed and the last quarter is pale with narrow dark bands.

Distribution

Varanus panoptes has a broad geographic range across the far North of Australia from the Kimberley to Cape York Peninsula, and southwards through most of Queensland. In the Northern Territory (NT), it has been recorded across most of the Top End and the Gulf Region (South to Katherine, Judbarra / Gregory National Park and the Gulf hinterland). A distinct subspecies occurs in the Pilbara and Gascoyne regions of Western Australia.



Known locations of the Yellow-spotted monitor

Conservation reserves where reported:
Black Jungle/Lambell's Lagoon Conservation Reserve, Casuarina Coastal Reserve, Charles Darwin National Park, Djukbinj National Park, Fogg Dam, Garig Gunak Barlu National Park, Judbarra / Gregory National Park, Kakadu National Park, Keep River National Park, Litchfield National Park, Manton Dam, Mary River National Park, Nitmiluk National Park and Umbrawara Gorge Nature Park.

Ecology

Varanus panoptes is a robust ground-dwelling monitor occupying a variety of habitats, including coastal beaches, floodplains, grasslands and woodlands. It feeds mostly on small terrestrial vertebrates and insects. It has an excellent sense of smell and often digs up prey, especially eggs of marine and freshwater turtles (Blamires 2004, Doody *et al.* 2007). It lays a clutch of eggs in a burrow in the ground, with egg-laying usually in the Wet season.

Conservation assessment

Varanus panoptes is widespread in the Northern Territory (NT). The most important conservation issue it faces is its propensity to eat cane toads and to die from the ingested toxins.

Tests of the effects of ingesting cane toad toxins have found that *V. panoptes* is very susceptible. Comparison of the size of the mouth and the toxin load per cane toad shows that these monitors are easily able to eat a cane toad large enough to kill them (Smith and Phillips 2006).

Burnett (1997) documented anecdotal reports of declines of several species of monitors (including *V. panoptes*) in Queensland following the arrival of cane toads in an area However, he also noted cases of *V. panoptes* persisting in areas (such as around Townsville) alongside cane toads, and Kutt *et al.* (2005) noted that this species had persisted in a site recently sampled on Cape York Peninsula.

A radio-tracking study of *V. panoptes* in Kakadu National Park documented a large decline in survival immediately after the arrival of cane toads (Griffiths and Holland 2004). Bigger animals were at greater risk but there was a large amount of variation in the population, suggesting some animals may avoid cane toads. Continued monitoring of *V. panoptes* in Kakadu showed they are still present in numerous locations three years after cane toads arrived (Griffiths and McKay 2005).

The abundance of *V. panoptes* dropped significantly after cane toads arrived at two sites on the Daly River (Doody *et al.* 2006). Abundance estimates dropped by 77 per cent and 90 per cent at the two sites one year after the arrival of toads. Radio-tracking concluded that at least 90 per cent of adult male V. *panoptes* on the Adelaide River floodplain were killed by toad ingestion (Ujvari and Madsen 2008).

A large proportion of the range of *V. panoptes* will be encompassed by the predicted range of the cane toad (Smith and Phillips 2006). As cane toads continue to spread across northern Australia, it is expected that local monitor populations will suffer crashes then slowly increase, but the impact on the NT-wide population will not be as severe as at individual locations.

Based on this information, *V. panoptes* is considered **Vulnerable** (under criterion A4e) due to:

- a population size reduction of >30 per cent, occurring and projected to be met within the next ten years or three generations due to the effects of an introduced taxon.

Threatening processes

As described above, the advance of cane toads across the NT presents the most acute threat facing this monitor. The species is highly susceptible to cane toad toxin and monitors can easily eat a cane toad large enough to kill them (Smith and Phillips 2006).

Conservation objectives and management

Cane toads have colonised much of the Top End of the NT and are slowly extending South. Efforts to control population in Darwin City continue experimental work at artificial watering points suggests this may be an effective management technique in more arid regions (Florance et al 2011).

Given our inability to prevent localised population crashes once cane toads arrive, conservation and management effort is best aimed at:

i. monitoring depleted populations to examine for evidence of recovery; and
ii. preventing cane toads from spreading to offshore islands with populations of monitors. The species is known from a number of NT islands, including Tiwi, Groote, Wessel, and English Company.

Complied by

Simon Ward
John Woinarski
Tony Griffiths
Lindley McKay
[updated December 2012]

References

Blamires, S.J. (2004) Habitat preferences of coastal goannas (*Varanus panoptes*): are they exploiters of sea turtle nests at Fog Bay, Australia? *Copeia* 2004, 370–377.

Burnett, S. (1997). Colonising cane toads cause population declines in native predators: reliable anecdotal information and management implications. *Pacific Conservation Biology* 3, 65-72.

Doody, J.S., Green, B., Sims, R, and Rhind, D. (2007). A preliminary assessment of the impacts of invasive cane toads (*Bufo marinus*) on three species of varanid lizards in Australia. *Mertensiella 16, 218-227.*

Doody, J.S., Green, B., Sims, R, Rhind, D., West, P., and Steer, D. (2006). Indirect impacts of invasive cane toads (*Bufo marinus*) on nest predation in pig-nosed turtles (*Carettochelys insculpta*) *Wildlife Research* 33, 349–354.

Florance, D., J. K. Webb, T. Dempster, M. R. Kearney, A. Worthing, and M. Letnic. (2011). Excluding access to invasion hubs can contain the spread of an invasive vertebrate. *Proceedings of the Royal Society B: Biological Sciences*:1-9.

Griffiths, A.D., and Holland, D.C. (2004). Impact of the exotic cane toad (*Bufo marinus*) on the survival of lowland *Varanus* species in Kakadu National Park. Report to Kakadu National Park. (Charles Darwin University, Darwin.)

Griffiths, A.D., and McKay, J.L. (2005). Monitoring the impact of cane toads on goanna species in Kakadu National Park. Report to Kakadu National Park, Department of Environment and Heritage. (Charles Darwin University, Darwin.)

Greer, A.E. (1989) *The biology and evolution of Australian lizards*. Surrey Beatty and Sons, Sydney.

Kutt, A.S., Bolitho, E.E., Retallick, R.W.R., and Kemp, J.E. (2005). Pattern and change in the terrestrial vertebrate fauna of the Pennefather River, Gulf of Carpentaria, Cape York Peninsula. In 'Gulf of Carpentaria Scientific Study Report.'. Pp. 261-300. Geography Monograph Series No. 10. (Royal Geographical Society of Queensland Inc., Brisbane.)

Smith, J.G., and Phillips, B.L. (2006). Toxic tucker: the potential impact of cane toads on Australian reptiles. *Pacific Conservation Biology* 12, 40-49.

Ujvari, B. and T. Madsen. 2009. Increased mortality of naïve varanid lizards after the invasion of non-native cane toads (Bufo marinus). *Herpetological Conservation and Biology* 4:248-251.