# Threatened Species Assessment

## *Morelia spilota metcalfei*
## Carpet Python

### Taxonomy

*Morelia spilota metcalfei* Wells & Wellington, 1985

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1993).

Categorised as Endangered in the 2013 Advisory list of threatened vertebrate fauna in Victoria (DSE 2013).

### Proposed conservation status

Endangered in Victoria

Criteria A2bce+3bce+4bce; B2ab(ii,iii,iv,v)

### Species Information

#### Description and Life History

The Inland Carpet Python is a slow-moving snake up to 190cm long, with an intricate pattern that consists mostly of black and shades of grey. The back is dark with pale markings and the sides are pale with a dark longitudinal stripe. The taxon is non-venomous and primarily nocturnal. While juvenile Inland Carpet Pythons are thought to feed mostly on lizards, adults prey upon small to medium-sized mammals, as well as birds, particularly those roosting in tree hollows.

Female Inland Carpet Pythons in Victoria may breed only every third or fourth year, taking that long to gather the resources needed for reproduction. Mating occurs in spring, with the eggs (averaging 20 per clutch) laid during the December to January period. The eggs are incubated by the female for 50 to 60 days - she coils her body around them, maintaining relatively high incubation temperatures by brief basking excursions and by shivering to produce heat. Inland Carpet Pythons are the only Victorian snake to exhibit parental care.

#### Generation Length

The generation length of the Inland Carpet Python is estimated to be 10 to 15 years. Several species of Australian pythons have lived at least 14 years in captivity, some individuals of larger pythons much longer (over 20 years) (Torr 2000). If sexual maturity is attained at 5-6 years and the snake breeds every 3 or 4 years, then it seems reasonable to assume that the time taken to completely replace the population in undisturbed pre-European conditions could be about 10-15 years.

#### Distribution

The taxon occurs along the east coast and adjacent ranges from interior of Queensland, NSW, Victoria and south-east South Australia. In Victoria its distribution is confined to locations north of the Great Dividing Range, mostly along the Murray River floodplain or in several rocky extrusions, with outlying records from the Wimmera.

#### Habitat

The Inland Carpet Python inhabits two very different environments in the north of the State - River Red Gum (*Eucalyptus camaldulensis*) forests and associated Black Box (*E. largiflorens*) woodlands along the major watercourses; and rocky hills, often within woodlands of Blakely's Red Gum (*E. blakelyi*). There are also some

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records from other vegetation types, such as mallee shrublands. Hollow-bearing trees and logs, or large rock outcrops, plus thick litter or shrub cover, are essential to the existence of Inland Carpet Pythons. These are used as shelter sites, to avoid predators, to ambush prey, and to assist in thermoregulation. Such features also provide essential habitat for prey items, particularly the herpetofauna consumed by juvenile pythons. Inland Carpet Pythons may also use rabbit burrows as shelter, with rabbits being a major food source. In some areas, they make use of houses and other human structures, where introduced rodents form part of the diet.

**Threats**

Threats to the taxon include clearing and degradation of habitat, mostly through cultivation and intense grazing; the removal of old trees and logs for firewood; inappropriate fire regimes that degrade understorey vegetation; changed flooding regimes in riverine areas; deliberate killing or illegal collection; accidental death through road kills; predation by foxes, feral cats and pigs; and reduced availability of prey.

## IUCN Criteria

**Criterion A. Population size reduction.**
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

| | Critically Endangered | Endangered | Vulnerable |
|---|---|---|---|
| A1 | ≥ 90% | ≥ 70% | ≥ 50% |
| A2, A3, A4 | ≥ 80% | ≥ 50% | ≥ 30% |

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [*(a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

*based on any of the following:*

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

## Evidence:

**Eligible under Criterion A2 as Endangered**

The population reduction over the past 30 to 45 years is inferred to be 40 to 70%, based on (b), (c) and (e) above.

Past reduction of the taxon's population is based on past and current estimated population size, drawing on Victorian Biodiversity Atlas (VBA) records and amalgamated field experience by government and consultant herpetologists over many years.

The causes of the reduction may not have ceased, be understood or be reversible.

**Eligible under Criterion A3 as Endangered**

The population reduction over the next 30 to 45 years is suspected to be 40 to 70%, based on (b), (c) and (e) above.

Decline is based on the paucity of records, decline of records and absence of animals from areas where it previously occurred. Much of its prey is introduced mammals (e.g. rabbits, rats, mice) which are subject to controls. Fox predation is a serious concern for this taxon.

**Eligible under Criterion A4 as Endangered**

The population reduction over any 30 to 45 year period, including both past and future, is inferred to be 40 to 70%, based on (b), (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Past and future reductions are based on the impacts of the identified threats.

| Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy | | | |
|---|---|---|---|
| | Critically Endangered<br>Very restricted | Endangered<br>Restricted | Vulnerable<br>Limited |
| B1. Extent of occurrence (EOO) | < 100 km² | < 5,000 km² | < 20,000 km² |
| B2. Area of occupancy (AOO) | < 10 km² | < 500 km² | < 2,000 km² |
| AND at least 2 of the following 3 conditions: | | | |
| (a) Severely fragmented OR Number of locations | = 1 | ≤ 5 | ≤ 10 |
| (b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals | | | |
| (c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals | | | |

## Evidence:

**Eligible under Criterion B2 as Endangered**

The Area of Occupancy (AoO) across the taxon's range is estimated to be 431 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the VBA.

The taxon is inferred to be severely fragmented. There are multiple, small isolated subpopulations that are all at risk from the identified threats, such that there is increased extinction risk and little or no probability of recolonisation should subpopulations become extinct.

It is inferred to have a continuing decline in (ii), (iii), (iv) and (v) above.

| Criterion C. Small Population size and decline | | | | |
|---|---|---|---|---|
| | | Critically Endangered | Endangered | Vulnerable |
| Number of mature individuals | | < 250 | < 2,500 | < 10,000 |
| AND at least one of C1 or C2 | | | | |
| C1 | An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future): | 25% in 3 years or 1 generation (whichever is longer) | 20% in 5 years or 2 generations (whichever is longer) | 10% in 10 years or 3 generations (whichever is longer) |
| C2 | An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions: | | | |
| (a) | (i) Number of mature individuals in each subpopulation | ≤ 50 | ≤ 250 | ≤ 1,000 |
| | (ii) % of mature individuals in one subpopulation = | 90 – 100% | 95 – 100% | 100% |
| (b) | Extreme fluctuations in the number of mature individuals | | | |

## Evidence:

**Ineligible under Criterion C**

It is inferred that there are 500 to 1,500 mature individuals, but this qualifier is too weak to meet this criterion and other thresholds under this criterion have not been met.

| Criterion D. Very small or restricted population | | | |
|---|---|---|---|
| | Critically Endangered | Endangered | Vulnerable |
| Number of mature individuals (observed or estimated) | < 50 | < 250 | < 1,000 |
| D2 Only applies to the VU category<br>Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time. | - | - | D2. Typically:<br>AoO < 20 km2 or number of locations ≤ 5 |

## Evidence:

**Ineligible under Criterion D**

It is inferred that there are 500 to 1,500 mature individuals, but this qualifier is too weak to meet the criterion.

**Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.**

## References

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