Records of the Inland Carpet Python *Morelia spilota metcalfei* (Serpentes: Pythonidae) in the North East Catchment Management Area, north-east Victoria, and the implications for fire planning

Damian R Michael[1,2,3] and Jerry Alexander[4]

[1]Ecotone Wildlife and Habitat Assessments, Albury, NSW 2640
[2]School of Environmental Sciences, Charles Sturt University, Albury, NSW 2640
[3]Fenner School of Environment and Society, The Australian National University, Canberra, ACT 0200
[4]Department of Environment and Primary Industries, 1 McKoy Street, Wodonga, Victoria 3690

Abstract
A study to obtain records of the endangered Inland Carpet Python *Morelia spilota metcalfei* Wells & Wellington 1984 was conducted in the North East Catchment Management Area, north-east Victoria, between August 2010 and February 2011. A range of survey methods were used to procure recent and historical records. Interviews with resident landholders and staff from natural resource management agencies produced 27 python records from 18 new localities. Nineteen records were authenticated and eight records remained unconfirmed. Most sightings were made by resident landholders from the late 1960s to the early 1980s and originated from Mount Pilot, Burrowa-Pine Mountain, Mount Mittamatite, Mount Granya, Mudgegonga, Rosewhite and the Warby Ranges. These new localities should be considered in regional and statewide conservation planning for the species. Vegetation assessments at each location revealed an association with Granitic Hills Woodland (EVC No. 72), confirming that north-facing remnants and granite landforms are important habitat for the Inland Carpet Python in north-east Victoria, and warrant further protection. Fire planning in the upper Murray region should consider fire intensity and the seasonal timing of burns to reduce the risk of habitat loss and mortality. Key recommendations, based on the ecological requirements of the Inland Carpet Python, include implementing small-scale, low intensity fires during late autumn. (*The Victorian Naturalist* **132** (2) 2015, 36–43)

Keywords: Pythonidae, *Morelia spilota*, fire planning, granite landforms

Introduction

The Inland Carpet Python *Morelia spilota metcalfei* (formerly *M. s. variegata*) Wells & Wellington 1984 is one of two sub-species of python that occur in Victoria (Wilson and Swan 2013). The Diamond Python *M. s. spilota* occurs along the east coast of Australia, extending from Point Hicks in Victoria (approximately 100 km south of the Victorian border) to the northern rivers region of New South Wales (Swan *et al.* 2004). The Inland Carpet Python occurs west of the Great Dividing Range, extending from central Queensland to the Warby Ranges in Victoria (Coventry and Robertson 1991) and as far as the Eyre Peninsula in South Australia (Schwaner *et al.* 1988). Recently, Taylor (2005) identified high levels of gene flow among Carpet Python subspecies, suggesting morphological differences were due to local adaptations rather than genetic divergence among populations. These findings suggest that python populations in eastern Australia may no longer warrant sub-specific status.

The Inland Carpet Python occupies a broad range of vegetation types, including swamps, woodlands and forest (Wilson and Swan 2013). In Victoria, the Inland Carpet Python occurs in River Red Gum *Eucalyptus camuldulensis* forest along the Murray River (Robertson and Hurley 2001), eucalypt woodland and Mallee vegetation types in western Victoria (Robertson *et al.* 1989), as well as granitic woodland such as the Warby Ranges near Wangaratta (Heard *et al.* 2004). In southern New South Wales, the Inland Carpet Python is predominantly restricted to large granite and metamorphic landforms (Michael and Lindenmayer 2008). The species is relatively catholic in its use of shelter sites, which include tree hollows, hollow logs, rock crevices, subterranean cavities, disused rabbit burrows (Heard *et al.* 2004), grain sheds and roof cavities (Shine 1994).

Anecdotal evidence suggests that Inland Carpet Python populations have declined over the last 100 years (Shine 1994; DSE 2003). Accordingly, the species is listed as endangered in Victoria (DSE 2013) and regionally endangered in the Western division of NSW (Sadlier and Pressey 1994; Sadlier 1994). Prior to this study, the Victorian Biodiversity Atlas contained 172 records of the species in Victoria (DEPI 2014), despite anecdotal reports of pythons being relatively common in the River Red Gum forests along the Murray River. However, in other parts of Victoria records of the Inland Carpet Python are scarce (DEPI 2014). For example, 19 records of the species exist in the North East Catchment Management Area (NECMA), and only two records exist within the upper Murray region, one from near Walwa and the other from the western slopes of Burrowa-Pine Mountain National Park (DEPI 2014).

This study aimed to procure additional records of the Inland Carpet Python in the NECMA, with particular focus on obtaining records and information on the habitat requirements of the species in the upper Murray catchment. Information collected in this study will be used to assist with fire planning in Mount Granya State Park, Mount Lawson State Park and Burrowa-Pine Mountain National Park (Michael 2011).

Methods

Study area

The study area included the NECMA in north-east Victoria, an area bounded by the Murray River in the north, the Victorian Alps in the south, the Warby Ranges in the west and the NSW border in the east. The area covers 1 957 000 ha and supports agriculture, forestry, tourism and manufacturing industries (NECMA 2011). The main bioregion in the area is the Northern Inland Slopes, a region characterised by floodplains, grassy valleys and undulating foothills. Historically, the Northern Inland Slopes supported a rich diversity of dry forest and woodland Ecological Vegetation Classes (EVCs), including large tracts of Box-Ironbark Forest, Granitic Hills Woodland, Herb-rich Woodland, Valley Woodland and Riverine Grassy Woodland. Many of these EVCs are now threatened by extensive clearing of native vegetation and habitat degradation caused by routine agricultural practices (http://www.depi.vic.gov.au/).

Survey protocols

Records of the Inland Carpet Python were obtained using a range of methods. These included:

1) Reviewing the Victorian Biodiversity Atlas database (http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/victorian-biodiversity-atlas), scientific and unpublished literature;
2) Placing an advertisement on the notice boards of general stores in the towns of Bellbridge, Bethanga, Walwa, Tintaldra and Cudgewa;
3) Conducting a letter drop to approximately 100 landholders along the Murray River Road;
4) Posting an article on the NE Landcare website www.northeast.landcarevic.net.au/news/carpet-python;
5) Publishing an article in *Odatria*, the online newsletter of the Victorian Herpetological Society http://vhs.com.au/wp-content/uploads/2011/05/Odatria_9_APR112.pdf;
6) Engaging in a community consultation process which included interviewing 11 long-term farmers (i.e. resident for more than 20 years) and seven new residents of 'small blocks' in the upper Murray catchment, particularly landholders between Bellbridge and Tintaldra. Long-term residents were visited based on recommendations by other landholders in the region;
7) Informal conversations with staff from natural resource management (NRM) agencies including the North East Catchment Management Authority (NECMA), Parks Victoria and Department of Environment and Primary Industries;
8) Conversations with colleagues and environmental consultants.
9) Informal conversations with landholders during a field day at Wise's Creek (Vincent's Reserve) Flora and Fauna Reserve, Talgarno;
10) Conducting a media release and interviews with Prime News, WIN News and Edge FM, Wangaratta in October 2010;
11) Publication of an article in the Border Mail;
12) Field surveys, involving 80 person hours searching for animals, sloughed skins or scats in Mount Granya State Park, Mount Lawson State Park and Burrowa-Pine Mountain National Park between October 2010 and February 2011.

Based on prior knowledge of the species' habitat (e.g. Heard *et al.* 2004; Michael and Lindenmayer 2008), field surveys targeted north-facing slopes within Granitic Hills Woodland and involved scanning logs, rocks and tree branches, inspecting tree hollows, hollow logs and rock crevices, and raking beneath shrubs and dense vegetation. During January, two nocturnal road

surveys were conducted along the Murray River Road between Bellbridge and Tintaldra (a distance of approximately 120 km).

To authenticate sightings, witnesses were asked to describe the details of their observation. They were then shown a series of pictures depicting different colour morphs, as well as images of other local snake species. Sightings were considered authentic if witnesses clearly recognised the species from the pictures or their descriptions conformed to 'typical' python behaviour (i.e. observed climbing or basking in trees, or observed with a 'rabbit-sized' bulge in the stomach). Where possible, the location of each sighting was visited, vegetation assessments were conducted and GPS co-ordinates recorded. Where second- or third-hand information was obtained, attempts were made to contact the original source. Records were classified as unconfirmed if the original source could not be contacted.

Results

The surveys procured a minimum of 27 additional Inland Carpet Python records from 18 new localities in the NECMA (Fig. 1). Nineteen records were considered authentic and eight records remained unconfirmed (Table 1). The majority of records were obtained via interviews with resident landholders and conversations with NRM staff. No records were obtained during field surveys of the large forest blocks. Most records obtained by resident landholders were from sightings of the species during the late 1960s to the early 1980s and originated from Mount Pilot, Burrowa-Pine Mountain, Mount Mittamatite, Mount Granya, Mudgegonga, Rosewhite, Glenrowan and the Warby Ranges (Table 1). The Mudgegonga and Rosewhite sightings, if authentic, represent significant range extensions.

Discussion

This study used a range of survey methods to obtain records of the Inland Carpet Python, with varying success. Survey results suggest that important historical information on distinctive rare species can be obtained by interviewing long-term landholders and staff from NRM agencies. Farmers who manage properties over many family generations often acquire valuable knowledge on the types of animals that once lived on their properties. However, this knowledge is rarely documented or entered into wildlife atlas databases. Similarly, NRM staff members are frequently contacted by the local community with information of wildlife sightings, but again many sightings remain unconfirmed and undocumented. Records that cannot be positively identified should not be registered with the Victorian Biodiversity Atlas (VBA), as misidentified animals can cause potential problems with the quality of data that can be used in, for example, species distribution models.

The information provided in this study will be useful not only for fire planning in the upper Murray, but will be of particular value to public and private land managers interested in protecting (and potentially re-creating) habitat that is critically important to pythons and their prey. We obtained 18 new localities where the Inland Carpet Python had previously never been recorded in the NECMA (Fig. 1). Many of the new localities originated from the upper Murray region, and included areas such as Bellbridge, Mount Granya, Thologolong, Guys Forest, Corryong and Mount Mittamatite. In addition, new localities outside of the upper Murray region included Mount Pilot, Eldorado, Rosewhite, Mudgegonga, Lurg and Glenrowan (Table 1). These new areas should now be considered in regional and statewide conservation planning for the species. Python sightings at these locations have some features in common, namely aspect and geology. Vegetation assessments at each site revealed a strong association with Granitic Hills Woodland EVC. This EVC is therefore a critically important component of the species' habitat requirements in north-east Victoria, and concurs with similar findings from the Warby Ranges (Heard *et al.* 2004) and the South-west Slopes of NSW (Michael and Lindenmayer 2008). This study thus provides additional evidence to suggest that protecting remnants of Granitic Hills Woodland should be a high priority in conservation planning for this species.

Records from near Rosewhite and Mudgegonga suggest that the species occupied a much wider geographical range than is currently recognised. Interestingly, the authors are aware of several anecdotal records from further south, in the Goulburn Broken catchment. For example, on 4 November 2011, an adult Inland Carpet

Table 1. Annotated list of previously undocumented records of the Inland Carpet Python *Morelia spilota metcalfei* in the North East Catchment Management Area, north-east Victoria (*Approximate locality only, derived from Google Earth based on eye witness accounts, NA = not available, bold type = known locality).

Locality	Latitude	Longitude	Elevation (metres)	Date	No.	Sighting details	Ecological Vegetation Class	Source
Corryong	Unknown	NA	NA	1960s	2+	Unconfirmed sightings on the Murray River floodplain and surrounding hills.	Granitic Hills Woodland EVC 72 and 295 (*E. blakelyi, E. albens, E. camuldulensis*).	Anonymous ex-resident of Corryong pers. obs.
Thologolong Station	35°59'17"	147°22'50"	260	1960 – late 1970s	4+	Regular sightings around property, several caught in rabbit netting, none after 1980.	Granitic Hills Woodland EVC 72 (*E. blakelyi, E. albens*)	Peter Sutherland pers. obs. (landholder)
Rosewhite	36°34'14"	146°55'04"	320	Jan 1963	1	Adult python observed crossing Happy Valley Creek 1 km from the Pinnacles.	Grassy Dry Forest (*E. goniocalyx, E. macrorhyncha, E. bridgesiana*)	Michael O'Sullivan pers. obs. (resident)
Eldorado*	36°18'21"	146°31'47"	200	1970	1	Unconfirmed adult python sighted near historical dredge.	Granitic Hills Woodland EVC 72 (*E. blakelyi*)	Anonymous landholder pers. comm.
North Wangaratta	36°19'56"	146°20'45"	145	1970s	1	Adult python sighted in a red gum tree in caravan park.	Riverine Grassy Woodland EVC 295 (*E. camuldulemsis*)	Geoff Barrow pers. comm. (Ranger, Parks Victoria)
Thologolong*	35°57'32"	147°2'443"	284	1970s	1	Unconfirmed python observed in gully. The specimen was shot.	Granitic Hills Woodland EVC 72 (*E. blakelyi, E. albens*)	David Star pers. comm. (landholder)
Guys Forest 'Avondale'	36°04'03"	147°37'36"	440	1970s	1	Adult python injured in farm shed, taken to a vet and released elsewhere.	Farmland	Kelton Goyne pers. comm. (Ranger, Parks Victoria)
Upper Lurg*	36°33'44"	146°09'18"	364	1975	1	Adult python sighted near rabbit warren in granite country.	Granitic Hills Woodland EVC 72 (*E. blakelyi, E. albens*)	Jim Jambrell pers. comm. (resident)
Peechelba, Killawarra State Forest	36°11'11"	146°11'18"	180	1980s	1	Unconfirmed road kill on north side of Killawarra State Forest.	Box Ironbark Forest EVC 61 (*E. sideroxylon*)	Geoff Barrow pers. comm. (Ranger, Parks Victoria)
Mudgegonga*	36°29'39"	146°49'05"	310	1980s	1	Adult python observed descending a tree along Burwidgee Ck.	Grassy Dry Forest (*E. goniocalyx, E. macrorhyncha, E. bridgesiana*)	Anonymous landholder pers. comm.
Bellbridge	36°06'16"	147°03'24"	191	Early 1990s	1	Adult observed in tree adjacent to Lake Hume, 2 km south of Bellbridge.	Mixed tree planting (*Eucalyptus maculata, E. sideroxylon*)	Rob Fenton pers. obs. (TAFE Riverina Institute)

Research Reports

Table 1. continued.

Locality	Latitude	Longitude	Elevation (metres)	Date	No.	Sighting details	Ecological Vegetation Class	Source
Murray River Rd, Mount Granya State Park	36°03'38"	147°18'17"	227	Early 1990s	2	Separate sightings of adults in trees on north-facing granitic woodland south of Murray River Rd.	Granitic Hills Woodland EVC 72 (*E. blakelyi, E. albens, E. macrorhyncha*)	Rob Fenton pers. obs. (TAFE Riverina Institute)
Burrowa–Pine* Mountain	36°00'06"	147°50'42"	650	1990s	2+	Unconfirmed sightings by bush walkers from the north-face near summit.	Granitic Hills Woodland EVC 72 (*E. blakelyi*)	Ian Davidson pers. comm. (ecologist)
Mount Mittamatite	36°08'54"	147°52'22"	900	1995	1	Unconfirmed adult sighted by R Hodge (retired DSE fire crew) near fire tower on the summit.	Granitic Hills Woodland EVC 72 (*E. blakelyi, E. goniocalyx*)	Kelton Goyne pers. comm. (Ranger, Parks Victoria)
Wangaratta, Warby Ranges State Park	36°15'27"	146°12'06"	290	1996+	2+	Several python sightings made during radio-telemetry study, e.g. Mount Killawarra.	Granitic Hills Woodland EVC No. 72 (*E. blakelyi, E. macrorhyncha*)	Geoff Barrow pers. comm. (Ranger, Parks Victoria)
Glenrowan	36°28'08"	146°13'58"	230	1998	2+	Adult python observed climbing tree in orchard, plus other unconfirmed sightings in area.	Granitic Hills Woodland EVC 72 (*E. blakelyi*)	Geoff Barrow pers. comm. (Parks Victoria)
Mount Pilot	36°14'58"	146°39'36"	400	2008	1	Adult sighted above Yeddonba rock art site.	Granitic Hills Woodland EVC 72 (*E. blakelyi, Callitris endlicheri*)	Donna Mitch pers. obs. (DSE)
Mount Mittamatite	36°08'54"	147°52"22"	900	2009		Unconfirmed python scat found near summit fire tower (Scat not verified by author)	Granitic Hills Woodland EVC No. 72 (*E. blakelyi, E. goniocalyx*)	John Silins pers. comm. (Ranger, Parks Victoria)
Glenrowan	36°27'50"	146°13'22"	240	2009	1	Road-killed adult (approx 3 m total length) sighted in town.	Township	Ian Davidson (ecologist) pers. comm.
Wangaratta, Warby Ranges State Park	36°18'49"	146°12'29"	320	2011	1	Road kill adult python along Wangandary Road Warby Ranges. Specimen lodged with Parks Victoria.	Granitic Hills Woodland EVC No. 72 (*E. blakelyi*)	Shaun Huguenin pers. comm. (DSE)

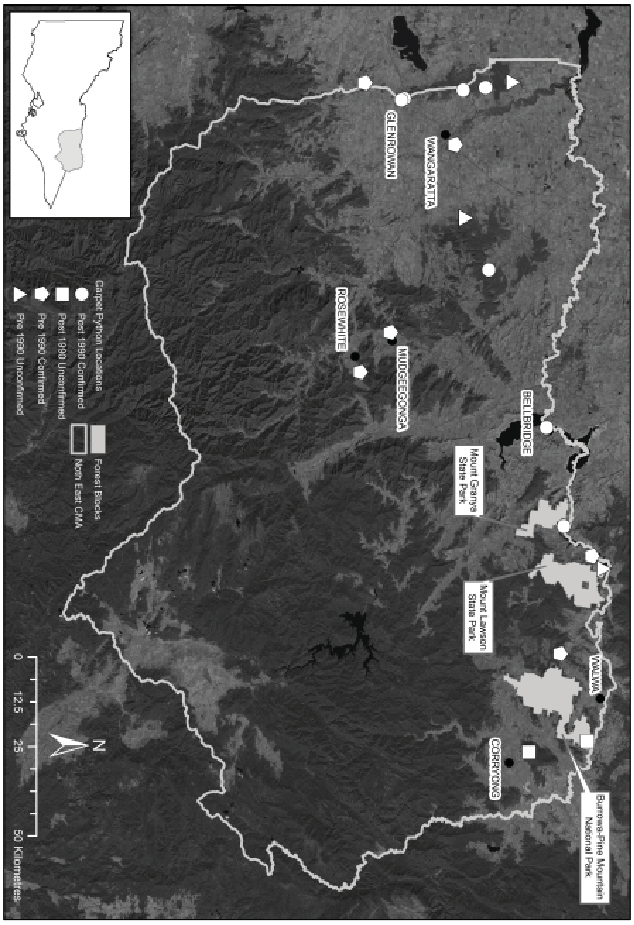

Fig. 1. Location of previously undocumented records of the Inland Carpet Python *Morelia spilota metcalfei* in the North East Catchment Management Area, north-east Victoria.

Python (presumably) was sighted from Swampy Riparian Woodland 1 km north of the township of Strathbogie (K Petrovic pers. obs.). Two unconfirmed python sightings also exist from near Ruffy. One sighting was from a chicken coop (S Sass pers. comm.) and the other, in October 2012, was from a granite outcrop near Mount Tickatory (J Morton pers. comm.). It is possible that pythons may still inhabit granite country as far south as Tallarook. However, given the lack of recent sightings from areas such as the Lurg Hills, it is likely that python populations have been fragmented for many generations, resulting in population declines and probably local extinction. Our findings clearly indicate that python observations have become much fewer and more sporadic in the past 25 years (Fig. 1). One reason why the Inland Carpet Python may have declined in areas where it was once common may relate to prey availability. One landholder noted that pythons disappeared shortly after populations of the European Rabbit *Oryctolagus cuniculus* declined following the introduction of myxomatosis, particularly after 1080 poison baits were used in the early 1970s (P Sutherland pers. comm.). The European Rabbit can develop a resistance to myxomatosis (Kerr and McFadden 2002), and for this reason the species is still common in agricultural landscapes. However, 1080 baits also kill non-target species such as native rats *Rattus* sp. and possums (McIlroy 1982), which are prey items of pythons in general (Fearn *et al.* 2002). Thus, loss of prey abundance and variety may have contributed to declines in the Inland Carpet Python (Shine 1994).

Implications for fire planning

The majority of the records obtained in this study were from the upper Murray catchment. This region contains three large forest blocks that are managed by Parks Victoria and the Department of Environment and Primary Industries (formerly Department of Sustainability and Environment). Planned fires in these forest blocks occur on a regular basis to meet State targets (Recommendation 56: http://www.royalcommission.vic.gov.au/Assets/VBRC-Final-Report-Recommendations.pdf). Below, we review the relevant literature and outline key

recommendations to help guide fire planning in potential Inland Carpet Python habitat such as Granitic Hills Woodland.

Two studies have examined the effects of fire on pythons. One study on the Western Australian Carpet Python *M. s. imbricata* found that fire affects the species in complex ways depending on the intensity and extent of the burn (Pearson *et al.* 2005). For example, high severity fires can destroy hollow logs (shelter sites) but also promote dense shrub regeneration (habitat for prey). The second study on the Diamond Python from the east coast of Australia found time-since-fire and fire intensity had no influence on home range size (Michael *et al.* 2013). However, despite the paucity of investigations on the effects of fire on the Inland Carpet Python, known aspects of its ecology should be considered when planning fire in Granite Hills Woodland. These include: 1) use of arboreal habitats, 2) breeding locations, 3) thermoregulatory behaviour and 4) prey availability. We provide recommendations in relation to these topics in more detail below.

Two studies have found the Inland Carpet Python to be arboreal in late summer and autumn (Heard *et al.* 2004; Corey and Doody 2010). Corey and Doody (2010) also found that non-breeding females and juveniles tend to be more arboreal than adult males. When in trees pythons generally bask on exposed limbs or high within the canopy, and may remain in the same tree for several weeks (D Michael pers. obs.). Furthermore, breeding females incubate clutches of up to 25 eggs in either cavities below the ground (D Michael unpublished data) or within hollow logs between January and March (Heard *et al.* 2006). Thus, fires that are planned for the late summer to early autumn have the potential to consume canopy foliage and kill non-breeding females and juveniles. Fire during this period may also kill females brooding within hollow logs. To reduce the risk of habitat loss and mortality during the breeding season, we recommend that burns should be conducted in early spring or late autumn.

Successive changes in vegetation structure following high-intensity fire can influence the composition of reptile communities (Masters 1996; Lindenmayer *et al.* 2008; Smith *et al.* 2013). Soon after intense fire, species that require open habitats are favoured, whereas species that depend on unburnt habitat are disadvantaged. Regrowth vegetation (and correlated canopy cover) can also reduce solar penetration and hence the abundance of heliothermic reptiles (Michael *et al.* 2011). The Inland Carpet Python often basks in open places that receive high amounts of solar radiation (Shine 1994). High intensity planned burns that promote dense regrowth (thickets of vegetation) may reduce basking sites. Furthermore, planned burns which result in the removal of canopy foliage may increase terrestrial behaviour, which in turn may expose the species to greater risk of predation by introduced predators, such as the European Fox *Vulpes vulpes* (Heard *et al.* 2006). To reduce the risk of creating stands of dense regrowth, we recommend that planned burns are low intensity.

The Inland Carpet Python preys on a range of small to medium-sized mammals (Shine 1994), including introduced species such as the European Rabbit (Heard *et al.* 2004). Post-fire changes in the amount of habitat available can have a significant influence on mammalian prey (Fox and McKay 1981), especially hollow-dependent fauna such as possums and gliders (Gibbons and Lindenmayer 2002). Post-fire surveys of arboreal marsupials near Gerogery, NSW, indicate that the abundance of the Common Brush-tail Possum *Trichosurus vulpecula* and the Common Ring-tail Possum *Pseudocheirus peregrinus* can be significantly reduced (D Michael unpublished data). Hence, the loss of mature, hollow-bearing trees may have a long-lasting effect on the distribution and abundance of prey. To reduce the risk of losing hollow-bearing trees, we recommend the use of low intensity planned burns.

This study has highlighted the value of interviewing resident landholders to obtain historical information on a distinctive rare and cryptic species. Our findings suggest that pythons may have (or at least had) a much wider distribution than previously recognised, and further surveys are required to verify anecdotal sightings outside of the species' known range. In north-east Victoria, the conservation of the Inland Carpet Python will be enhanced by reducing potential risks associated with planned burning operations in Granitic Hills Woodland. Key management recommendations based on the ecology of the species include implementing small-scale, low intensity fires during late autumn.

Acknowledgements

DM would like to thank Rob Fenton, David Star, Peter Sutherland, Ian Davidson, Glen Mawson, Nick Clemann, Peter Robertson, Janice Mentiplay-Smith, Steve Sass, Karolina Petrovic, Michael O'Sullivan, Jim Jambrell, Dave Smith, Nigel Jones, Glen Johnson, John Silins, Kelton Goyne and Shaun Huguenin for assisting with information. Geoff Barrow kindly provided access to unpublished material, and Anthony Cheeseman assisted with GIS mapping. We thank Nick Clemann for reviewing and improving an earlier version of this paper. This project was funded by the North East Catchment Management Authority and the former Department of Sustainability and Environment. This project was conducted under the DSE research permit number 10005355.

References

Corey B and Doody JS (2010) Anthropogenic influences on the spatial ecology of a semi-arid python. *Journal of Zoology* **281**, 293–302.

Coventry AJ and Robertson P (1991) *The Snakes of Victoria: A Guide to Their Identification*. (Department of Conservation and Environment: East Melbourne)

DSE (2003) Inland Carpet Python *Morelia spilota metcalfei*. Action Statement: *Flora and Fauna Guarantee Act 1988*, No. 175. Department of Sustainability and Environment, Victoria.

DSE (2013) Advisory List of Threatened Vertebrate Fauna in Victoria – 2013. Department of Sustainability and Environment, East Melbourne.

DEPI (2014) *Victorian Biodiversity Atlas*. Department of Environment and Primary Industries, Victoria.

Fearn S, Robinson B, Sambono J and Shine R (2002) Pythons in the pergola: the ecology of 'nuisance' carpet pythons (*Morelia spilota*) from suburban habitats in south-eastern Queensland. *Wildlife Research* **28**, 573–579.

Fox BJ and McKay GM (1981) Small mammal responses to pyric successional changes in eucalypt forest. *Australian Journal of Ecology* **6**, 29–41.

Gibbons P and Lindenmayer DB (2002) *Tree Hollows and Wildlife Conservation in Australia*. (CSIRO Publishing: Melbourne)

Heard GW, Black D and Robertson P (2004) Habitat use by the inland carpet python (*Morelia spilota metcalfei*: Pythonidae): seasonal relationships with habitat structure and prey distribution in a rural landscape. *Austral Ecology* **29**, 446–460.

Heard GW, Robertson P, Black D, Barrow G, Johnson P, Hurley V and Allen G (2006) Canid predation: a potentially significant threat to relic populations of the Inland Carpet Python *Morelia spilota metcalfei* (Pythonidae) in Victoria. *The Victorian Naturalist* **123**, 68–74.

Kerr P and McFadden G (2002) Immune responses to Myxoma virus. *Viral Immunology* **15**, 229–246.

Lindenmayer DB, Wood JT, MacGregor C, Michael DR, Cunningham RB, Crane M, Montague-Drake R, Brown D, Muntz R and Driscoll D (2008) How predictable are reptile responses to wildfire? *Oikos* **117**, 1086–1097.

Masters P (1996) The effects of fire-driven succession on reptiles in spinifex grassland at Uluru National Park, Northern Territory. *Wildlife Research* **23**, 39–48.

McIlroy JC (1982) The sensitivity of Australian animals to 1080 poison IV. Native and introduced rodents. *Australian Wildlife Research* **9**, 505–517.

Michael DR (2010) What makes a good rocky outcrop? In *What Makes a Good Farm for Wildlife?* pp. 97–11. Ed DB Lindenmayer. (CSIRO Publishing: Melbourne)

Michael DR (2011) Conservation and management of the Inland Carpet Python (*Morelia spilota* ssp. *metcalfei*) in North Eastern Victoria with implications for fire planning in the upper Murray. Report to the Department of Sustainability and Environment, Wodonga.

Michael DR and Lindenmayer DB (2008) Records of the Inland Carpet Python, *Morelia spilota metcalfei* (Serpentes: Pythonidae), from the South-western Slopes of New South Wales. *Proceedings of the Linnean Society of New South Wales* **129**, 253–261.

Michael DR, Cunningham RB and Lindenmayer DB (2011) Regrowth and revegetation in temperate Australia presents a conservation challenge for reptile fauna in agricultural landscapes. *Biological Conservation* **144**, 407-415.

Michael DR, Cunningham RB, MacGregor C, Brown D and Lindenmayer DB (2013) The effects of prey, habitat heterogeneity and fire on the spatial ecology of peninsular Diamond Pythons (*Morelia spilota spilota*: Pythonidae). *Austral Ecology* **39**(2), 181–189.

NECMA (2011) North East Catchment Management Authority. www.necma.vic.gov.au.

Pearson D, Shine R and Williams A (2005) Spatial ecology of a threatened python (*Morelia spilota imbricata*) and the effects of anthropogenic habitat change. *Austral Ecology* **30**, 261–274.

Robertson P and Hurley VG (2001) Report on habitat of the Inland Carpet Python (*Morelia spilota metcalfei*) in the Mildura Forest Management Area. (Department of Natural Resources and Environment: Melbourne)

Robertson P, Bennet AF, Lumsden LF, Silveira CE, Johnson PG, Yen AL, Milledge GA, Lillywhite PK and Pribble HJ (1989) Fauna of the Mallee study area north-western Victoria. (Arthur Rylah Institute for Environmental Research: Victoria)

Sadlier RA (1994) Conservation status of the reptiles and amphibians in the Western Division of New South Wales – an overview. In *Future of the fauna of Western New South Wales* pp. 161–167. Eds D Lunney, S Hand, P Reed and D Baker. (Surrey Beatty and Sons: Sydney)

Sadlier RA and Pressey RL (1994) Reptiles and amphibians of particular conservation concern in the Western Division of New South Wales: a preliminary analysis. *Biological Conservation* **69**, 42–54.

Shine R (1994) The biology and management of the Diamond Python (*Morelia spilota spilota*) and Carpet Python (*M. s. variegata*) in NSW. (NSW National Parks and Wildlife Service: NSW)

Schwaner T, Francis M and Harvey C (1988) Identification and conservation of carpet pythons (*Morelia spilota imbricata*) on St. Francis Island, South Australia. *Herpetofauna* **18**, 13–20.

Smith A, Bull C and Driscoll D (2013) Successional specialization in a reptile community cautions against widespread planned burning and complete fire suppression. *Journal of Applied Ecology* **50**, 1178–1186.

Swan G, Shea G and Sadlier R (2004) *A Field Guide to Reptiles of New South Wales*. (Reed New Holland: Sydney).

Taylor DA (2005) Using DNA markers for wildlife management and protection: a study of the population structure and systematics of the Australian carpet pythons (Reptilia: *Morelia spilota* complex). (Unpublished PhD Thesis: Flinders University, Adelaide, SA)

Wilson S and Swan G (2013) *A Complete Guide to Reptiles of Australia*, 4 edn. (New Holland Publishers: Sydney)

Received 29 May 2014; accepted 21 August 2014