

BIOSECURITY
NEW ZEALAND

POST-BORDER DETECTION

9 AUGUST 2023

DG-257382



Morelia spilota mcdowelli

s9(2)(a)

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Daniel Green
Diagnostic & Surveillance Services
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Dear Daniel,

Re: Submission Reference: DG-257382

I have identified the specimen received on 7 August 2023 and my determination follows:

Accompanying information

Description: Snake (python), ex. Australia
Interception: Post-border
Life state on arrival: Alive
Observation date: 5 August 2023
Location: OceanaGold, Waihi, Coromandel
BNZ contact: Daniel Green; Incursion Investigator (Biosecurity New Zealand)
Phone: s9(2)(a) [REDACTED]
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Taxonomy

Species: (Reptilia: Pythonidae) *Morelia spilota* (Lacépède, 1804)
Subspecies/ morph: *Morelia spilota mcdowelli* Wells & Wellington 1984
Common names: Coastal carpet python
Conservation status: IUCN Redlist: Least Concern (ver. 3.1, 2017)
CITES listing: Appendix II
Status in New Zealand: *Morelia spilota* is not presently found in New Zealand.

Specimen description

Medium-sized snake (total length 792 mm) found alive at a mine site in Waihi, Coromandel on 5 August 2023. Diagnostic morphometric details: snout–vent length 680 mm; vent–tail length 112 mm; head width 16.4 mm; head length 27.3 mm; weight 90.68 g; mid-body scale rows 50; ventral scales 282; subcaudal scales 82. Sex: male (juvenile). No ectoparasites associated with specimen. Signs of minor trauma (i.e., a small puncture wound) were found on the ventral surface of the body.

The round tail, enlarged ventral scales covering less than half the width of the body, fragmented head scales, and the >30 mid-body scale rows confine this specimen to the F. Pythonidae. Several diagnostic characters identify it as a species of *Morelia*—including the presence of teeth on the premaxilla, the absence of apical pits on the dorsal scales, the uniform size of the gular scales bordering the mental groove and heat-sensing pits on the rostral. It keys to *Morelia spilota* sensu lato in having fragmented head scales, <9 scales across the head between the eyes, numerous loreals, 1st and 2nd supralabials with shallow pits, infralabials with six pits in a deep groove below the eye, and smooth body scales.

Morelia spilota is a species complex¹ that has been the source of considerable confusion and argument relating to its geographical distribution and taxonomic status². Depending on the authority, the complex comprises several morphs, subspecies, or in some cases full species distinguished largely based on geographic distribution but also on differences in colour pattern. Generally, there are six accepted subspecies, plus a Papuan subspecies of which the taxonomic validity remains controversial. Some authors have chosen to raise particular subspecies to full species (e.g., *Morelia spilota imbricata* to *M. imbricata*) but for the purpose of this report I have chosen to follow the subspecific determinations.

The colour pattern of the current specimen is typical of the so-called coastal carpet python, *Morelia spilota mcdowelli* Wells & Wellington 1984. That is, it displays an olive brown to tan background colour overlaid with paler blotches and stripes that are edged in black. However, as the colour pattern of *M. spilota* can vary considerably and alone does not provide a diagnostic character for subspecific identification, closer examination of the meristic (scale) characters is necessary. The current specimen has 50 scale rows at mid-body, 282 ventral scales, and 82 subcaudal scales, and a total length/ snout-vent length ratio of 1.165, which places it closer to the eastern subspecies/ populations of *M. spilota* (i.e., *M. s. mcdowelli*) than to the western, central, southern, or northern

¹ A group of closely related organisms that are so similar in appearance and other features that the boundaries between them are often unclear.

² O'Shea, M. (2007). Boas and pythons of the world. New Holland Publishers. London, UK. 160 pp.

populations according to Schwaner *et al.*, (1988)³. On the weight of morphological evidence, this specimen has been identified as *M. s. mcdowellii*.

Distribution and natural history

Morelia spilota sensu lato has a wide distribution in Australia, including most of the continent except for the arid regions of the centre and west, and the cool southern parts of New South Wales, Victoria and South Australia. It is also present in southern and south-eastern New Guinea but is absent from Tasmania. *Morelia spilota mcdowellii* occurs along the eastern seaboard from Cape York to northern New South Wales.

Morelia spilota sensu lato occupies a wide range of habitat types ranging from dense rainforests to semi-arid woodland and shrubland. It has coped well with environmental modification and is commonly present in agricultural and horticultural areas, and in well-vegetated urban environments. It is a very elusive nocturnal species that hides during the day in dense vegetation or in or under other secure cover, including entering buildings. Because of its secretive habits, *Morelia spilota* sensu lato is generally a lot more abundant than observations of it suggest.

Morelia spilota sensu lato is arboreal or terrestrial, and feeds primarily on vertebrates, including small mammals, birds and reptiles, with the juveniles typically feeding on lizards. Prey items are killed by constriction (suffocation) and are swallowed whole. *Morelia spilota mcdowellii* can reach a considerable size, with adults easily growing to 2.5–3 m long and some specimens recorded up to 4.2 m long.

Morelia spilota sensu lato is oviparous and as an adult, breeds in the wild only every two or three years. Oviposition in the wild is in late spring to early summer. The average clutch sizes are 15–35 (range 7–54) but this varies a bit between the different 'subspecies' (e.g., *M. s. mcdowellii* may only produce 10–13 eggs). After oviposition, the eggs are 'incubated' by the female until they hatch. Incubation takes around two months depending on temperature (range 37–102 days). Size at hatching is variable with recorded total lengths ranging from 280–580 mm (typically 300–400 mm).

³ Schwaner, T.; Francis, M.; Harvey, C. (1988). Identification and conservation of Carpet pythons (*Morelia spilota imbricata*) on St. Francis Island, South Australia. *Herpetofauna*, 18 (2): 13–20.

Circumstances surrounding detection

The live snake was found by employees of the OceanaGold Waihi Operation mine, approximately 6 km underground in an active mine shaft at approximately 16:00hrs on Saturday 5 August 2023. The snake reportedly emerged from a “large pile of rock bolts”⁴ and was sighted by a mine worker(s), who promptly captured and secured the snake in a plastic container. The observation was reported to the Ministry for Primary Industries via the 0800 pest and disease hotline at 17:30 hrs on 5 August 2023. The snake was contained overnight and was collected from the OceanaGold premises by a certified MPI snake handler on Sunday morning, 6 August 2023. It was transported in a secure container to the Auckland Zoo Vet Hospital where it was humanely euthanised the same day. The dead snake specimen was delivered to s9(2)(a) for formal determination on 7 August 2023.

Information provided by OceanaGold following an enquiry by MPI Investigators into the possible importation pathway, revealed that the company uses high volumes of rock bolts in its mining operation and there have been 30 shipments of rock bolts to the Waihi mine in the past 12 months. Most recently, shipments of rock bolts were received from *DSI Underground*, Brisbane on 27 March 2023 and another arrived from *Split Set Mining Systems*, Perth on 28 June 2023. It was from the stack of Brisbane-origin bolts that the snake reportedly emerged.

The rock bolts are the split set or friction type, each of which consists of a ~30–40 mm diameter, ≈3.5 m long steel tube with a slot along its entire length. The rock bolts are transported to New Zealand in bundles on flat rack containers (see *Additional photographs* below) and the bundles are stacked and stored in yards above ground at the Waihi mine until required for use. Once moved underground, the bolts are stored loose in the ‘bolt store’, laying directly on the ground. The long hollow steel tubes could offer potential sites for snakes to enter and seek refuge, which is a plausible scenario especially where these rock bolts are stored, or even temporarily held, in outdoor yards in Australia prior to export. Furthermore, once the rock bolts are stacked in bundles the detection of potential stowaway snakes among the steel tubes would be extremely difficult.

To investigate the likelihood of the snake joining the consignment of rock bolts in Australia, a review of the aerial imagery of the two Australian rock bolt suppliers was undertaken. This showed that the premises of the Perth supplier (*Split Set Mining Systems*) was located in a built-up industrial estate in the suburb of Kewdale, not surrounded by parks nor bushland where pythons would typically be expected to occur. In contrast, the Brisbane *DSI Underground* premises is located on the outskirts of the greater Brisbane metropolitan area and is surrounded to the east and south by

⁴ A rock bolt is a steel rod inserted into the roof or walls of a rock formation to support underground excavation or to stabilise a jointed rock mass. They are widely used in the underground mining industry.

undeveloped bushland that forms the Freshwater National Park. *Morelia s. mcdowelli* is regarded as relatively common in southern Queensland and around the Brisbane area (including all suburbs and the inner city) and indeed, this species has been reported from Freshwater National Park⁵, as well as from the wider landscape surrounding the *DSI Underground* premises (*iNaturalist.nz*; accessed 8 August 2023). Therefore, it is conceivable that the subject python could have entered the *DSI Underground* yard in Brisbane of its own accord and got into a bundle of hollow rock bolts, which were subsequently exported to New Zealand.

If this was indeed the case, then there is a time difference of just over four months between the arrival of the snake in New Zealand (27 March 2023) and its detection at Waihi (6 August 2023). The length and weight of the snake indicates it is a juvenile and comparisons with captive growth rate information places it in the age class of approximately 1-2 months⁶. Seemingly, this estimated age does not align with the March arrival into New Zealand. However, growth rates of wild pythons are expected to be slower than captive individuals and in the current case, stress associated with inadvertent transport to a foreign country with a cooler environment and the likelihood of little or no feeding on route will have certainly had a negative effect on the individual's growth rate. Thus, it is very possible that the individual is older than two months and is simply small for its age. Pythons (and many other species of snake) can remain sedentary for long periods of time without the need for food, so it is quite plausible that the juvenile python could have remained with the imported bundle of rock bolts over the entirety of the four-month period (spanning New Zealand winter) while in New Zealand.

Considering the available information, the import pathway involving a juvenile python arriving in New Zealand as a stowaway among rock bolts from Brisbane, rather than Perth, is relatively convincing. This is the thirteenth record of *Morelia spilota* sensu lato in New Zealand. Previous records include: two specimens (one of which was a shed skin) that were illegally imported, six specimens (two of which were shed skins) that arrived as stowaways with shipping containers from Australia and Papua New Guinea, two specimens that arrived as stowaways in the undercarriages of aircraft from Australia, and one specimen that stowed away in a vehicle from Brisbane.

⁵ <https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wildlife/?ArealD=national-parkfreshwater&Kingdom=animals&SpeciesFilter=Native>

⁶ Fearn, S. (1996). Captive growth of a carpet python *Morelia spilota*. *Litteratura Serpentina*, 6 (4): 94–102.

Potential threat to New Zealand

Morelia spilota is non-venomous and not a danger to humans, although if provoked large individuals can inflict painful bites that carry the additional risk of bacterial infection at the bite site.

The ecology of *Morelia spilota sensu lato* (i.e., its broad habitat use; tolerance to cold—even including snowfall—; and high fecundity) and the southern limit of its distribution in Australia (S37.65°) indicates this species could potentially naturalise in the warmer parts of New Zealand if suitable propagules reached this country (Figure 1). If this species naturalised in New Zealand, it would present a potentially serious conservation threat to small vertebrates (e.g., birds, reptiles). In addition, it is possible there would be a risk of introducing novel diseases or parasites that might affect the indigenous reptile fauna.

Action: No further biosecurity action is recommended with respect to this detection.

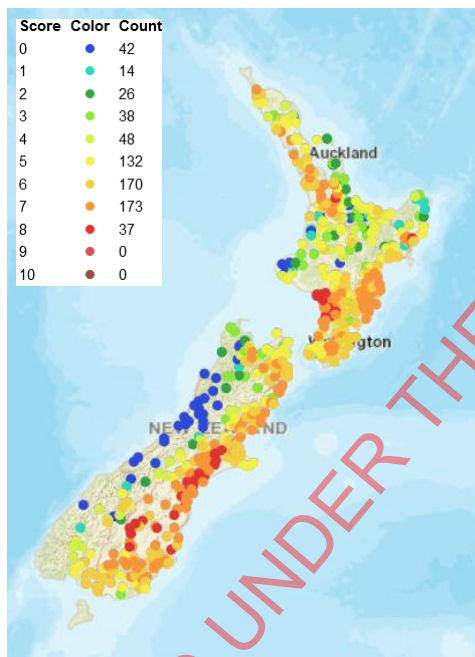


Figure 1. Climate match assessment of New Zealand with the climate parameters of the native range of *Morelia spilota sensu lato* (0 = climate not similar; 10 = very similar).

Additional photographs



The method of shipment (flat racks) for rock bolts imported from the Perth. The Brisbane shipment was transported using the same flat rack method. Images provided by OceanaGold.





Thanks to the MPI snake handler Zoran Sinovcic for collecting and delivering the specimen to me, and thanks to MPI Investigators Daniel Green and Harry Taylor and OceanaGold staff for providing background information that assisted with this determination. A copy of this report has been sent to wlv.idcreception@mpi.govt.nz, Specimen Reception Wallaceville, and Daniel Green, Lisa Maria, and Clive Pigott of BNZ (MPI).

Yours sincerely,

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