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The Australian skink genus *Notoscincus* Fuhn, 1969 revised!

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ABSTRACT

The diminutive Australian skink originally described as *Ablepharus ornatus* Broom, 1896, type locality Muldiva, north Queensland, was placed in a monotypic genus *Notoscincus*, proposed by Fuhn in 1969 and been placed there ever since.

The species *Ablepharus wotjulum* Glauert, 1959, from the West Kimberley division of Western Australia has been synonymised with *Notoscincus ornatus* by most authors since, although also generally treated as a subspecies.

Exceptional to this has been Greer (1974) as well as Wells and Wellington (1985), who also described a centralian population as *N. watersi*.

Their new species name was declared as "probably a *nomen nudem*", by Shea (1987) and again by Shea and Sadlier (1999), although significantly, the latter authors also wrote: "*we recognise the taxonomic distinction of this species*".

Notwithstanding the preceding, this obvious morphologically distinct species has been ignored by Australian herpetologists in the 23 years since 1999.

Storr 1979 described the divergent species *N. butleri* from the south Pilbara in Western Australia.

Following examination of specimens from across the range of all putative taxa and reviewing the primary literature, the following new taxonomy is proposed according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999):

All of *N. ornatus*, *N. wotjulum*, *N. watersi* and *N. butleri* are valid species.

The name *N. watersi* is not *nomen nudem* as alleged by Shea (1979), or Shea and Sadlier (1999) and their claim to that effect is wholly dishonest, lacking any factual basis.

Glenn Shea in particular has a long history of taxonomic vandalism and improperly synonymising species formally named by people he sees as "rivals" (e.g. Shea *et al*. 2011; Shea *et al*. 2020; Rowley *et al*. 2021; Shea 2021).

N. ornatus sensu lato is split further with three morphologically distinct species formally named for the first time, these being populations from the Pilbara, which includes a newly named subspecies, one from the top end of the Northern Territory and another from Groote Eylandt, Northern Territory.

N. butleri is also transferred to a newly named genus *Lineascincus gen. nov*. based on clear divergence from the others in the genus *Notoscincus.*

Keywords: Australia; taxonomy; nomenclature; skink; lizard; Northern Territory, Queensland, Western Australia; *Notoscincus*; *ornatus; wotjulum*; *watersi*; *butleri*; New Genus; *Lineascincus*; New Species; *flecka*; *monodorsa*; *whoa*; New Subspecies; *fereflecka.*

INTRODUCTION

The diminutive Australian skink originally described as *Ablepharus ornatus* Broom, 1896, type locality Muldiva, north Queensland, was placed in a monotypic genus *Notoscincus*, proposed by Fuhn in 1969 and has been placed there ever since.

The species *Ablepharus wotjulum* Glauert, 1959, from the West Kimberley division of Western Australia has been synonymised with *Notoscincus ornatus* by most authors since, although also generally treated as a subspecies.

Exceptional to this has been Greer, 1974 as well as Wells and Wellington (1985), who also described a centralian population as *N. watersi*.

Their new species name was declared *nomen nudem*, by

Shea (1987) and again by Shea and Sadlier (1999), although significantly, the latter authors also wrote: "*we recognise the taxonomic distinction of this species*".

Notwithstanding the preceding statement of the obvious, this obvious morphologically distinct species has been ignored by Australian herpetologists since 1999.

Storr 1979 described the divergent species *N. butleri* from the south Pilbara in Western Australia.

In line with edicts of a cohort including Rick Shine, Glenn Shea and Welsh criminal Wolfgang Wuster there has been a well-enforced ban on other herpetologists using the taxonomy and nomenclature of Wells and Wellington (1985), even when it is obviously the only sensible one that exists.

While this ban commenced in 1987, with the publication of Shine (1987), and should have ended with the ICZN ruling against Shine and the cohort in 1991 (ICZN 1991) as well as later rulings (ICZN 2001, 2021), this ban on all things Wells and Wellington still carries traction in 2022.

This manifests in texts such Cogger (2000 or 2014), which maintains the falsehood that *N. ornatus* is just one species, with *N. wotjulum* synonymised and treated as a subspecies, while *N. watersi* is treated as if it does not exist.

When *N. watersi* is depicted online in photo sharing sites such as "flickr.com" it is invariably misidentified, usually as mutant looking *N. ornatus*.

Pyron *et al.* (2013) showed *Notoscincus ornatus* as being most closely related to *Ctenotus* Storr, 1964 *sensu lato* and *Lerista* Bell, 1833 *sensu lato* but separate on a long stem on its own, indicating an extremely ancient divergence from the other genera.

This immediately flagged the putative species *Notoscincus ornatus* as being potentially composite, especially when reconciled with a distribution encompassing most of the northern half of the Australian mainland.

While there were at least two synonym names potentially available for given populations in three widely scattered parts of Australia, based on the comments of Shea (1987) and Shea and Sadlier (1999), the availability of at least one of the names was placed in doubt.

On the basis of the facts that the putative species *N. ornatus* was widespread and potentially composite, it was decided to audit this taxon and the closely related *N. butleri* to ascertain relationships within and between the taxa to confirm current taxonomy and to see if any new species remained undetected.

MATERIALS AND METHODS

A review of the relevant literature encompassing the three putative species within *Notoscincus* Fuhn, 1869, as generally defined by herpetologists in Australia, including as recently defined by Cogger (2014) was conducted.

This included revisiting the molecular studies available on Australian skinks as a means to estimate likely divergences across known biogeographical barriers and breaks.

Specimens of each putative species from across their known ranges were inspected, including both live and dead animals as well as photos of specimens with known provenance.

The regional populations conforming to putative species but identified as potentially unnamed species were inspected as were all other major populations.

Biogeographical gaps were identified which conformed with absence of specimens being seen, collected or held in Australian public museums, these usually being outlier populations, including some known to separated by previously determined biogeographical barriers.

The papers naming putative taxa within *Notoscincus* were reviewed, not just for the purposes of revisiting original descriptions, which were checked against actual specimens, but also cross referenced with the second, third and fourth editions of the *International Code of Zoological Nomenclature* as published by the International Commission of Zoological Nomenclature (ICZN) to ensure that all post 1950 names were valid according to the rules of the ICZN at all materially relevant times, including 2022.

The lizards were inspected with a view to confirming if there were consistent identifiable differences between putative species enabling formal descriptions to be made as required.

Literature relevant to the taxonomic conclusions herein, including other recent splits of putative species from the northern half of Australia include the following:

Broom (1896), Butler (1970), Cogger (2000, 2014), Cogger *et al*. (1983), Copland (1952), Couper *et al*. (2006), Fuhn (1969), Glauert (1959), Greer (1974), Hutchinson *et al*. (2021), Pyron *et al.* (2013), Reeder (2003), Ride *et al*. (1999), Shea and Sadlier (1999), Singhal *et al*. (2018), Skinner *et al.* (2013), Storr (1974, 1979), Storr, Smith and Johnstone (1981, 1999), Wells and Wellington (1984, 1985), Wilson (2015), Wilson and Swan (2010) and sources cited therein.

RESULTS

Following examination of specimens from across the range of all putative taxa and reviewing the primary literature, the following new taxonomy is proposed according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999):

All of putative *N. ornatus*, *N. wotjulum*, *N. watersi* and *N. butleri* are valid species.

For the record, the name *N. watersi* was scrutinized and it was not a *nomen nudem* as alleged by Shea (1987) or Shea and Sadlier (1989) (see below).

N. ornatus sensu lato is split further with three morphologically distinct species formally named for the first time, these being populations from the Pilbara, which includes a newly named subspecies, one species from the top end of the Northern Territory, with a distribution centred on the Arnhem Land escarpment and nearby areas to the south and south-west and another substantially different species from Groote Eylandt, Northern Territory.

N. butleri is also transferred to a newly named genus *Lineascincus gen. nov*. based on clear morphological divergence from the others in the genus *Notoscincus.*

***NOTOSCINCUS WATERSI* WELLS AND WELLINGTON, 1985 IS A VALIDLY NAMED TAXON.**

With it being asserted as a "fact" in the literature that *Notoscincus watersi* Wells and Wellington, 1985 is probably a *nomen nudem* (Shea 1987, Shea and Sadlier, 1999) along with the other obvious fact confirmed by the same authors and again herein, being that the Centralian form of putative *N. ornatus* was a different species, it is self-evident that the species needed to be called something.

If *N. watersi* was in fact *nomen nudem* I could simply assign a name to the taxon and describe it as that herein.

However before making this leap of faith, it was important that I consult the original literature to confirm (or refute) the claim that *N. watersi* is in fact a *nomen nudem*, because if the claim that *N. watersi* is *nomen nudem* was an error, my renaming that taxon would then be an act of poor scientific method, taxonomic vandalism, or both!

In other words, "probably" was not a scientific way to deal with the "problem" of *N. watersi.*

I had to confirm with certainty, whether or not *N. watersi* was a *nomen nudem* in order to properly resolve the taxonomy and nomenclature of the relevant species complex.

To decide whether or not *N. watersi* is or is not a *numen nudem* did not require me to consult with Glen Shea or Wells and Wellington, although I did consult all the parties and not surprisingly, Shea continued to assert *nomen nudum* for the name and the other two the reverse.

All that mattered in the first instance was for me to consult the original publication (the description) and also the relevant in force *International Code of Zoological Nomenclature*.

To put the Wells and Wellington description of *N. watersi* to the

full test, it was lined up with the relevant sections of Code, 2, 3, and 4, noting that their description was published while Code 2 was in force and that each edition of the code supersedes the previous one.

To arrive at the conclusion that *N. watersi* was not a *nomen nudum*, I inspected the original publication of Wells and Wellington (1985) and cross-referenced the exact words of this with the in force, second edition of the *International Code of Zoological Nomenclature*, that being the applicable code in 1985.

The third edition was only published in 1988, although it carried an earlier publication date inside its cover.

In any event, the result of cross-matching Wells and Wellington's 1985 description of *N. watersi* to the rules of the *International Code of Nomenclature*, did not change, regardless of whether or not Code 2, 3, or 4 were used.

So that the false claim of *nomen nudem* against the Wells and Wellington name *N. watersi* Wells and Wellington, 1985 is put to rest, I hereby produce the relevant description in full below as well as the relevant definitions of *nomen nudum* in Code editions 2, 3 and 4, with the relevant parts relating to availability of names.

The Wells and Wellington description of 1985 read exactly as follows:

"Notoscincus watersi sp. nov.

Holotype: An adult specimen in the Australian Museum R84555. Collected at 50 km south of Alice Springs, Northern Territory (24 05'S X 135 35'E) by Richard Wells and Dave Moralka, on 22 April, 1979.

Diagnosis: Storr, (1971:112) gives a description of this species (as* Notoscincus ornatus ornatus*'). We regard Storr's description as adequate for diagnosing this species from* N. ornatus *of Broom, 1896 (Type Locality, Muldiva north Queensland) and* N. watjulum *of Glauert, 1959. Storr, Smith and Johnstone, (1981: Plate 17.8) figure a specimen of* Notoscincus watersi *(cited as* Notoscincus ornatus ornatus*). Schwaner and Miller (1984b) reported the occurrence of what we herein regard as* Notoscincus watersi *in northern South Australia. The holotype of* N. watersi *was taken in a habitat of Triodia on red sand dunes following rainy weather. Etymology: Named for Peter Waters, previously of Pendle Hill, N. S. W., in recognition of his donation of reptile specimens (now in the Australian Museum)."

The definitions of *nomen nudem* in each of Codes 2, 3, and 4 are given below:

Code 2:

"nomen nudum. ***A name that, if published before 1931, fails to satisfy the conditions of Articles 12 and 16, or, if published after 1930, fails to satisfy the conditions of Article 13a.*****"**

Code 3:

"nomen nudum (pl. nomina nuda). ***A name that, if published before 1931, fails to conform to Article 12; or, if published after 1930, fails to conform to Article 13. A* nomen nudum *is not an available name and therefore the same name may be made available later for the same or a different concept; in such a case it would take authorship and date [Arts 50, 21] from that act of establishment, not from any earlier publication as a* nomen nudum.**"**

Code 4:

"nomen nudum ***(pl.* nomina nuda*), n. A Latin term referring to a name that, if published before 1931, fails to conform to Article 12; or, if published after 1930, fails to conform to Article 13. A* nomen nudum *is not an available name, and therefore the same name may be made available later for the same or a different concept; in such a case it would take authorship and date [Arts. 50, 21] from that act of establishment, not from any earlier publication as a* nomen nudum.*"***

The relevant parts the Same Codes with respect to availability of names read as follows:

Code 2, states that for a name to be valid and available it must be:

"(i) accompanied by a statement that purports to give characters differentiating the taxon; or

(ii) accompanied by a definite bibliographic reference to such a statement; or

(iii) proposed expressly as a replacement for a pre-existing available name."

Code 3 states that for a name to be valid and available it must be:

"(i) accompanied by a description or definition that states in words characters that are purported to differentiate the taxon, or

(ii) accompanied by a bibliographic reference to such a published statement even if contained in a work published before 1758 or that is not consistently binominal (for information excluded for reasons of anonymity after 1950 see Article 14), or

iii) proposed expressly as a new replacement name (nomen novum) for an available name."

Code 4, states that for a name to be valid and available it must be:

"13.1.1. be accompanied by a description or definition that states in words characters that are purported to differentiate the taxon, or

13.1.2. be accompanied by a bibliographic reference to such a published statement, even if the statement is contained in a work published before 1758, or in one that is not consistently binominal, or in one that has been suppressed by the Commission (unless the Commission has ruled that the work is to be treated as not having been published [Art. 8.7]), or

13.1.3. be proposed expressly as a new replacement name (nomen novum) for an available name, whether required by any provision of the Code or not."

Put simply, because the Wells and Wellington description cites a type specimen in a museum and in this case the description furthermore is "*"(i) accompanied by a statement that purports to give characters differentiating the taxon ; or (ii) accompanied by a definite bibliographic reference to such a statement*" their name must be treated as valid and available and most certainly not a *nomen nudum*.

Other Wells and Wellington names and descriptions from their 1985 publication were tested against the three Codes and none were found to be *nomen nudem*.

This test included names cited by Shea and Sadlier (1999) for which they commented "*This name is probably a* nomen nudum", that being an idiot statement in the first instance.

It is not a difficult exercise to match the Wells and Wellington descriptions with the Code and to decide one way or other whether or not the names comply with the Code or do not!

There was no ambiguity in the code, nor for that matter the Wells and Wellington (1985) descriptions and so there was no need for me to defer to anyone else for advice or clarification on these important matters.

In summary the claims by Shea (1987) and later Shea and Sadlier (1999) that each of the various names proposed by Wells and Wellington (1985) were "*probably a* nomen nudum" was wholly dishonest and a claim lacking any factual basis.

Glenn Shea in particular has a long history of taxonomic vandalism and/or improperly synonymising species formally named by people he sees as "rivals" (e.g. Shea *et al*. 2011; Shea et al. 2020, Rowley et al. 2021 and Shea 2022).

He has also been campaigning against Wells and Wellington in particular since 1987 (see Shea 1987 and ICZN 1991, 2001, 2021), or Hoser (2007) for a summary to that date.

In 2011, Shea (2011) illegally and in breach of the *International*

Code of Zoological Nomenclature (Ride *et al*. 1999) created a neotype for *Cyrtodactylus abrae* Wells, 2002 from north Queensland, the neotype being of a totally different species from Singapore, then going on to rename the species (*Cyrtodactylus abrae*) in the same paper as *Cyrtodactylus hoskini* Shea, Couper, Wilmer and Amey, 2011.

In 2020 Shea was lead author in a paper that unlawfully renamed *Supremechelys* Hoser, 2014 as *Chelydera* Shea, Thomson and Georges 2020.

In 2021, along with Jodi Rowley and a cohort of thieves, Shea illegally renamed the taxon *Colleeneremia dentata toowoombaensis* Hoser, 2020 as "*Litoria balatus*" in the PRINO (peer reviewed in name only) online journal *Zootaxa*, (commonly known as *Zootoxic*).

In 2022, he ostensibly peer reviewed a paper published in same the PRINO (peer reviewed in name only) online journal *Zootaxa*, that unlawfully renamed the west Australian frog genus *Wellingtondella* Hoser, 2020 as *Anstisia* Webster and Bool, 2022.

The latter paper was merely a rehash of the relevant parts of the much larger Hoser paper from 2020, and in the most important parts of the formal description was little more than a direct cut and paste from the Hoser (2020) paper, meaning it violated the Australian Copyright Act (1968).

The relevant parts are Sections 36, 115, 189, 190, 193, 194 and 195.

All the above referred to papers that Shea either wrote or edited, were egregious acts of taxonomic vandalism and serious breaches the most important parts of the *International Code of Zoological Nomenclature.*

In Shea (2021), he lied and misquoted the *International Code of Zoological Nomenclature* to falsely allege that tribe descriptions in Hoser (2015) did not comply with the code, when they did. He also improperly synonymised various lizard taxa in a series of actions that also had potentially grave wildlife conservation implications.

Shea's acts of taxonomic vandalism are more culpable in that they defy formal rulings against this by the ICZN in 1991, 2001 and 2021 (ICZN 1991, 2001, 2021).

The first of these rulings was in direct response to Shine (1987) and Shea (1987), which were a formal petition to the ICZN to formally erase the works of Wells and Wellington from the scientific record to enable them the right to formally rename the same species and genera and claim discovery of them.

Quite properly, the ICZN in a near unanimous vote, went against the request of Shine and Shea.

Finally with respect to *N. watersi*, if the name were not compliant with the *International Code of Zoological Nomenclature* and it was in fact a *nomen nudum*, I would not have hesitated to assign a new name to that entity.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature (ICZN).

This includes if gender assignment of suffixes seems incorrect, Latinisation is wrong, apparent spelling mistakes and so on.

In the unlikely event two or more newly named taxa are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (fourth edition) (Ride *et al.* 1999) as amended online since.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 19 July 2022 (including if also viewed prior), unless otherwise stated and was accurate in terms of the content cited herein as of that date.

Any online citations within this paper, including copied emails and the like, are not as a rule cited in the references part of this paper and have the same most recent viewing date as just given.

Unless otherwise stated explicitly, colour and other descriptions apply to living adult specimens of generally good health, as seen by day, and not under any form of stress by means such as excessive cool, heat, dehydration, excessive ageing, abnormal skin or reaction to chemical or other input.

SVL or SV means snout-vent length, TL means tail length, preanal pores = precloacal pores, preanal = precloacal, tail measurements refer to original tails, max. size refers to maximum known, sometimes approximated up to the nearest 10 mm if number of measured specimens is below 10.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant genera, subgenera, species or subspecies has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

CONSERVATION STATUS OF THE RELEVANT TAXA

Using accepted criteria of assessment, none of the relevant species are of immediate conservation concern. However on a larger time frame (hundreds of years), the comments in Hoser (1989, 1991, 1993 and 1996) apply, as do the comments in Hoser (2019a, 2019b).

LINEASCINCUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:1D8C4B6D-3D07-4632-9F1D-3A78B538FA41

Type species: *Notoscincus butleri* Storr, 1979.

Diagnosis: *Lineascincus gen. nov*. monotypic for the species *Notoscincus butleri* Storr, 1979, is readily separated from the genus *Notoscincus* Fuhn, 1969 by the following suite of characters:

1/ A dorsal pattern consisting of bold alternating dark and light stripes on the dorsum (versus not so in *Notoscincus*);

2/ Three (versus 4) supraoculars;

3/ Small ear opening with 2-4 small ear lobules (versus no ear lobules);

4/ 40 mm snout-vent (adults), versus 30 mm snout-vent in adult *Notoscincus.*

Both *Lineascioncus gen. nov*. and *Notoscincus* are separated from all other Australian skinks by the following suite of characters: Moderate-sized pentadactyle limbs, meeting or overlapping when adpressed; small ear-opening; no supranasals; nasals undivided; large prefrontals in contact or narrowly separated; parietal shields in contact behind the interparietal; lower eyelid totally fused to the upper eyelid to form a permanent spectacle; subdigital lamellae divided (modified from Cogger 2014).

The type species for *Lineascioncus gen. nov*. is depicted in life in Cogger (2014) on page 665 and Wilson and Swan (2017) on page 381 at second from bottom on left.

Distribution: Restricted to the Pilbara region of Western Australia, south of the Fortescue River.

Etymology: *Lineascioncus gen. nov*. is named in reflection of the fact it is a lined skink.

Content: *Lineacincus butleri* (Storr, 1979) (monotypic).

NOTOSCINCUS FLECKA SP. NOV.

LSIDurn:lsid:zoobank.org:act:212B2E88-FDD9-472E-986B-0F3B07CA3F22

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R39052 collected from Cockeraga River, Chichester Range, Western Australia, Australia, Latitude -21.717 S., Longitude 118.633 E.

This government-owned facility allows access to its holdings.

Paratype: A male specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R104027 collected from Woodstock station, Western Australia, Australia, Latitude -21.609444., Longitude 119.021389 E.

Diagnosis: Until now, most herpetologists in Australia have treated *Notoscincus ornatus* (Broom, 1896) as a single wide-ranging species, found from north-east Queensland, across the northern half of Australia to the western Australian coast.

The most notable exception to the preceding was Wells and Wellington (1985), who treated the putative species as three.

This paper herein recognises six species, being as follows:

Notoscincus ornatus (Broom, 1896), type locality Muldiva, north-east Queensland, and a species confined to north-east Queensland, extending west to the Mount Isa region;

N. watjulum (Glauert, 1959), type locality Wotjulum Mission, West Kimberley, Western Australia and apparently restricted to the west Kimberley of Western Australia;

N. watersi Wells and Wellington, 1985, type locality 50 km south of Alice Springs, Northern Territory being a species occurring in the red centre of Australia and nearby arid areas to the north, including the Tanami Desert;

N. flecka sp. nov. from the Pilbara region, Western, Australia, including the subspecies *N. flecka fereflecka subsp. nov*. from the Cape Range area in Western Australia;

N. monodorsa sp. nov. from the top end of the Northern Territory, including a distribution from the western Gulf of Carpentaria across to the East Kimberley in Western Australia;

N. whoa sp. nov. from Groote Eylandt, eastern Northern Territory.

The six species are readily separated from one another by the following suites of characters:

Notoscincus ornatus is separated from the other five species the presence of a silver-grey brownish dorsum of the body, either without spotting or 10-15 well-defined black spots along the mid-dorsal line of the body and others continuing along the dorsal midline of the tail; the flanks are black or mainly black on the top half or slightly more, these being distinctively broken by elongate, thin, light brown blotches, cutting off the black or nearly so, top and bottom, giving a barred appearance along each side, which continues at a lesser intensity beyond the hind limb and onto the tail. Lower flanks are mainly white with darker greyish marbling or mottling. Upper labials are mainly white with dark etching and a slightly brownish tinge.

N. watjulum is separated from the other five species the presence of a silver-grey brownish dorsum of the body, with 8-12 well-defined black spots on the body and others continuing along the dorsal midline of the tail; slightly more than half of the flank, being the upper part has a thick well-defined black stripe, with a well defined top and bottom border and no cross bars of any form (as seen in *N. ornatus*), although in some specimens the upper line is wavy as there are infusions from the dorsum, these rarely forming triangles on the upper surface of the border. This black stripe on either side of the body starts at the snout, runs though they eye, above the axila of the fore-limbs, along the flanks, through the axila of the hind limbs and onto the tail, where it both diffuses and some barring forms across the black stripe.

Beneath this dark stripe on either side is a well defined white border, below which is only limited greyish flecks or mottling. The anterior upper labials are greyish or brown.

N. watersi is separated from the two preceding species by having upper flanks that are mainly brownish in colour, being a medium chocolate brown, with evenly spaced, vertically elongate, dark brown spots. The whitish lower flanks are similarly infused meaning the distinction between the two zones in terms of colour contrast is less. Between the upper and lower parts of the flanks as just described is a bold but broken thin white line that commences below the eye, extends over the forelimb, onto the flank and through the hind-limb onto the anterior tail.

The dorsum of this species is brown on top with three rows of medium to large, dark brown spots running longitudinally down the body, with the middle of these (on the dorsal midline) extending onto the tail and about half its length. The chocolate-brown upper surface of the head is heavily peppered or flecked with dark grey. Anterior upper labials are brown.

N. flecka sp. nov. is similar in many respects to *N. watersi* as described above, but differs from that species and the other four species by having limited speckling, peppering or spots on the brown upper surface of the head or anterior snout (versus heavily peppered in *N. watersi*); small rather than medium-sized dorsal spots and dorsal spots that blackish, rather than dark brown; upper flanks that are mainly dark brown to black, but broken by elongate-light brown spots to give a barred appearance; brown anterior upper labials. Upper surfaces of the limbs and the tail are greyish in colour.

N. flecka fereflecka subsp. nov. is separated from nominate *N. flecka sp. nov*. by having upper surfaces of the limbs and the tail that are brownish, rather than greyish and the white line on either side of the lower flank of the tail is prominent, rather than indistinct in *N. flecka sp. nov*..

N. monodorsa sp. nov. is similar in most respects to *N. watjulum* as defined above, but is separated from that taxon by the general absence of a series of spots running down the midline of the dorsum on the body. These spots do commence either near the pelvic girdle and/or from the anterior part of the tail. On some aberrant specimens there are spots on the dorsum, but these are invariably not in a linear form as seen in typical *N. watjulum.* The black line on the upper flank of *N. monodorsa sp. nov.* is reduced in the thickness, meaning it only occupies half, or slightly less of the flank, with the immaculate white line below being more prominent, although there is commonly grey marbling beyond the first part of the white line as one moves towards the venter.

N. whoa sp. nov. is a very different looking lizard to the other five species.

It is a light sandy grey colour on the dorsum with 9-14 medium sized spots running down the midline of the body, which become obscure beyond the pelvic girdle as one moves down the tail towards the distal end.

The dark stripe on the side of the upper flank occupies the top 2/3 and is heavily infused from the top with triangular-shaped cuttings, giving the flanks are barred appearance, the colour of the infusions being the same light grey colour of the dorsum, this same pattering continuing onto the tail, but losing intensity as one moves distally. The dark grey between the light grey infusions is also faded, meaning the lizard as a whole has a faded appearance, which is a contrast to the other species, which do not have the same faded look.

The upper surfaces of the limbs are light grey to whitish, with well defined dark grey markings occupying about 20% of the surface.

The six preceding species, being the entirety of the genus *Notoscincus* Fuhn, 1969 as defined herein, are readily separated from the species *Lineacincus butleri* (Storr, 1979), previously also placed in *Notoscincus*, by having:

1/ A dorsal pattern not consisting of bold alternating dark and light stripes on the dorsum (versus does in *Notoscincus*);

2/ Four (versus 3) supraoculars;

3/ Small ear opening with no ear lobules (versus2-4 small ear lobules);

4/ 30 mm snout-vent (adults), versus 40 mm snout-vent in adult *Lineascioncus gen. nov*..

Both *Lineascioncus gen. nov*. and *Notoscincus* are separated

from all other Australian skinks by the following suite of characters: Moderate-sized pentadactyle limbs, meeting or overlapping when adpressed; small ear-opening; no supranasals; nasals undivided; large prefrontals in contact or narrowly separated; parietal shields in contact behind the interparietal; lower eyelid totally fused to the upper eyelid to form a permanent spectacle; subdigital lamellae divided (modified from Cogger 2014).

Notoscincus ornatus in life is depicted in Wilson (2015) on page 175, second from bottom and online at:
https://www.flickr.com/photos/127392361@N04/52197340091/
and
https://www.flickr.com/photos/jackgamblewildlife/18640165530/

N. watjulum in life is depicted online at:
https://www.flickr.com/photos/chrisjolly1989/38426733851/
and
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https://www.flickr.com/photos/euprepiosaur/21785415053/

N. watersi in life is depicted in Storr, Smith and Johnstone, (1981: Plate 17.8), being at the bottom right and online at:
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and
https://www.flickr.com/photos/whawha88/9432285267/
and
https://www.flickr.com/photos/whawha88/11972139905/

N. flecka sp. nov. is depicted in life online at:
https://www.flickr.com/photos/124699310@N06/42012583624/player/394bba68a1
and
https://reptile-database.reptarium.cz/species?genus=Notoscincus&species=ornatus
and
https://biocache.ala.org.au/occurrences/6a3063d5-694e-4817-a5a6-4a06f42e1d85

N. flecka fereflecka subsp. nov. in life is depicted online at:
https://biocache.ala.org.au/occurrences/d0ebd331-8a3c-4a89-8879-b95931c2724c

N. monodorsa sp. nov. is depicted in life in Cogger (2014) on page 666 at top and online at:
https://www.inaturalist.org/observations/104023848
and
https://www.flickr.com/photos/121210153@N05/13955812648/
and
https://www.flickr.com/photos/smacdonald/4508551017/
and
https://www.flickr.com/photos/euprepiosaur/7531671490/

N. whoa sp. nov. is depicted in life online at:
https://australian.museum/blog/amri-news/much-to-discover-collaborative-biodiversity-surveys-in-northern-australia/

The type species for *Lineascioncus gen. nov*. is depicted in life in Cogger (2014) on page 665 and Wilson and Swan (2017) on page 381 at second from bottom on left.

Distribution: *N. flecka sp. nov*. occurs within the main Pilbara region, Western, Australia.

The subspecies *N. flecka fereflecka subsp. nov*. is found in the Cape Range area in Western Australia and immediately adjacent parts of the Pilbara coast.

Etymology: The name *N. flecka sp. nov*. derives from the dorsal flecks or spots that characterise this species as described by the local Yindjibarndi native Aboriginal people, the majority of whom were systematically exterminated by the British when they invaded the area in the 1800's.

NOTOSCINCUS FLECKA FEREFLECKA SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:B299DDF8-A7EE-49A1-832B-EE5623536049

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R88636 collected from 3 km north west of Bullara Homestead, Exmouth Gulf, WA, 6707, Australia, Latitude -22.65 S., Longitude 114.033333 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R132449 collected from 2 km west of Bullara Homestead, Exmouth Gulf, WA, 6707, Australia, Latitude -22.68 S., Longitude 114.016667 E.

Diagnosis: Until now, most herpetologists in Australia have treated *Notoscincus ornatus* (Broom, 1896) as a single wide-ranging species, found from north-east Queensland, across the northern half of Australia to the western Australian coast.

The most notable exception to the preceding was Wells and Wellington (1985), who treated the putative species as three.

This paper herein recognises six species, being as follows:

Notoscincus ornatus (Broom, 1896), type locality Muldiva, north-east Queensland, and a species confined to north-east Queensland, extending west to the Mount Isa region;

N. watjulum (Glauert, 1959), type locality Wotjulum Mission, West Kimberley, Western Australia and apparently restricted to the west Kimberley of Western Australia;

N. watersi Wells and Wellington, 1985, type locality 50 km south of Alice Springs, Northern Territory being a species occurring in the red centre of Australia and nearby arid areas to the north, including the Tanami Desert;

N. flecka sp. nov. from the Pilbara region, Western, Australia, including the subspecies *N. flecka fereflecka subsp. nov*. from the Cape Range area in Western Australia;

N. monodorsa sp. nov. from the top end of the Northern Territory, including a distribution from the western Gulf of Carpentaria across to the East Kimberley in Western Australia;

N. whoa sp. nov. from Groote Eylandt, eastern Northern Territory.

The six species are readily separated from one another by the following suites of characters:

Notoscincus ornatus is separated from the other five species the presence of a silver-grey brownish dorsum of the body, either without spotting or 10-15 well-defined black spots along the mid-dorsal line of the body and others continuing along the dorsal midline of the tail; the flanks are black or mainly black on the top half or slightly more, these being distinctively broken by elongate, thin, light brown blotches, cutting off the black or nearly so, top and bottom, giving a barred appearance along each side, which continues at a lesser intensity beyond the hind limb and onto the tail. Lower flanks are mainly white with darker greyish marbling or mottling. Upper labials are mainly white with dark etching and a slightly brownish tinge.

N. watjulum is separated from the other five species the presence of a silver-grey brownish dorsum of the body, with 8-12 well-defined black spots on the body and others continuing along the dorsal midline of the tail; slightly more than half of the flank, being the upper part has a thick well-defined black stripe, with a well defined top and bottom border and no cross bars of any form (as seen in *N. ornatus*), although in some specimens the upper line is wavy as there are infusions from the dorsum, these rarely forming triangles on the upper surface of the border. This black stripe on either side of the body starts at the snout, runs though they eye, above the axila of the fore-limbs, along the flanks, through the axila of the hind limbs and onto the tail, where it both diffuses and some barring forms across the black stripe.

Beneath this dark stripe on either side is a well defined white border, below which is only limited greyish flecks or mottling. The anterior upper labials are greyish or brown.

N. watersi is separated from the two preceding species by having

upper flanks that are mainly brownish in colour, being a medium chocolate brown, with evenly spaced, vertically elongate, dark brown spots. The whitish lower flanks are similarly infused meaning the distinction between the two zones in terms of colour contrast is less. Between the upper and lower parts of the flanks as just described is a bold but broken thin white line that commences below the eye, extends over the forelimb, onto the flank and through the hind-limb onto the anterior tail.

The dorsum of this species is brown on top with three rows of medium to large, dark brown spots running longitudinally down the body, with the middle of these (on the dorsal midline) extending onto the tail and about half its length. The chocolate-brown upper surface of the head is heavily peppered or flecked with dark grey. Anterior upper labials are brown.

N. flecka sp. nov. is similar in many respects to *N. watersi* as described above, but differs from that species and the other four species by having limited speckling, peppering or spots on the brown upper surface of the head or anterior snout (versus heavily peppered in *N. watersi*); small rather than medium-sized dorsal spots and dorsal spots that blackish, rather than dark brown; upper flanks that are mainly dark brown to black, but broken by elongate-light brown spots to give a barred appearance; brown anterior upper labials. Upper surfaces of the limbs and the tail are greyish in colour.

N. flecka fereflecka subsp. nov. is separated from nominate *N. flecka sp. nov*. by having upper surfaces of the limbs and the tail that are brownish, rather than greyish and the white line on either side of the lower flank of the tail is prominent, rather than indistinct in *N. flecka sp. nov*..

N. monodorsa sp. nov. is similar in most respects to *N. watjulum* as defined above, but is separated from that taxon by the general absence of a series of spots running down the midline of the dorsum on the body. These spots do commence either near the pelvic girdle and/or from the anterior part of the tail. On some aberrant specimens there are spots on the dorsum, but these are invariably not in a linear form as seen in typical *N. watjulum.* The black line on the upper flank of *N. monodorsa sp. nov.* is reduced in the thickness, meaning it only occupies half, or slightly less of the flank, with the immaculate white line below being more prominent, although there is commonly grey marbling beyond the first part of the white line as one moves towards the venter.

N. whoa sp. nov. is a very different looking lizard to the other five species.

It is a light sandy grey colour on the dorsum with 9-14 medium sized spots running down the midline of the body, which become obscure beyond the pelvic girdle as one moves down the tail towards the distal end.

The dark stripe on the side of the upper flank occupies the top 2/3 and is heavily infused from the top with triangular-shaped cuttings, giving the flanks are barred appearance, the colour of the infusions being the same light grey colour of the dorsum, this same pattering continuing onto the tail, but losing intensity as one moves distally. The dark grey between the light grey infusions is also faded, meaning the lizard as a whole has a faded appearance, which is a contrast to the other species, which do not have the same faded look.

The upper surfaces of the limbs are light grey to whitish, with well defined dark grey markings occupying about 20% of the surface.

The six preceding species, being the entirety of the genus *Notoscincus* Fuhn, 1969 as defined herein, are readily separated from the species *Lineacincus butleri* (Storr, 1979), previously also placed in *Notoscincus*, by having:

1/ A dorsal pattern not consisting of bold alternating dark and light stripes on the dorsum (versus does in *Notoscincus*);

2/ Four (versus 3) supraoculars;

3/ Small ear opening with no ear lobules (versus2-4 small ear lobules);

4/ 30 mm snout-vent (adults), versus 40 mm snout-vent in adult *Lineascioncus gen. nov*..

Both *Lineascioncus gen. nov*. and *Notoscincus* are separated from all other Australian skinks by the following suite of characters: Moderate-sized pentadactyle limbs, meeting or overlapping when adpressed; small ear-opening; no supranasals; nasals undivided; large prefrontals in contact or narrowly separated; parietal shields in contact behind the interparietal; lower eyelid totally fused to the upper eyelid to form a permanent spectacle; subdigital lamellae divided (modified from Cogger 2014).

Notoscincus ornatus in life is depicted in Wilson (2015) on page 175, second from bottom and online at:
https://www.flickr.com/photos/127392361@N04/52197340091/
and
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N. watjulum in life is depicted online at:
https://www.flickr.com/photos/chrisjolly1989/38426733851/
and
https://www.flickr.com/photos/reptileshots/51284555563/
and
https://www.flickr.com/photos/euprepiosaur/21785415053/

N. watersi in life is depicted in Storr, Smith and Johnstone, (1981: Plate 17.8), being at the bottom right and online at:
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and
https://www.flickr.com/photos/smacdonald/5718360226/
and
https://www.flickr.com/photos/whawha88/9432285267/
and
https://www.flickr.com/photos/whawha88/11972139905/

N. flecka sp. nov. is depicted in life online at:
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and
https://reptile-database.reptarium.cz/species?genus=Notoscincus&species=ornatus
and
https://biocache.ala.org.au/occurrences/6a3063d5-694e-4817-a5a6-4a06f42e1d85

N. flecka fereflecka subsp. nov. in life is depicted online at:
https://biocache.ala.org.au/occurrences/d0ebd331-8a3c-4a89-8879-b95931c2724c

N. monodorsa sp. nov. is depicted in life in Cogger (2014) on page 666 at top and online at:
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https://www.flickr.com/photos/smacdonald/4508551017/
and
https://www.flickr.com/photos/euprepiosaur/7531671490/

N. whoa sp. nov. is depicted in life online at:
https://australian.museum/blog/amri-news/much-to-discover-collaborative-biodiversity-surveys-in-northern-australia/

The type species for *Lineascioncus gen. nov*. is depicted in life in Cogger (2014) on page 665 and Wilson and Swan (2017) on page 381 at second from bottom on left.

Distribution: The subspecies *N. flecka fereflecka subsp. nov*. occurs in the Cape Range area in Western Australia as well as the immediately adjacent Pilbara coast.

The nominate form of the species *N. flecka sp. nov*. occurs in the main Pilbara region, Western, Australia.

Etymology: The scientific name *N. flecka fereflecka subsp. nov*. derives from the species name with the added suffix, “Fere”, which in Latin means “not quite”.

NOTOSCINCUS MONODORSA SP. NOV.

LSIDurn:lsid:zoobank.org:act:B4A92BE9-AD30-4E6D-B810-9A792BDBABE6

Holotype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J83977 collected from Kolorbidahdah, West Arnhem Land, Northern Territory, Australia, Latitude -12.650556 S., Longitude 134.298056 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Northern Territory Museum, Darwin, Northern Territory, Australia, specimen number R18780 collected from Cadell River, Arnhem Land, Northern Territory, Australia, Latitude -12.625 S., Longitude 134.328 E. and 2/ A preserved specimen at the Northern Territory Museum, Darwin, Northern Territory, Australia, specimen number R25603 collected from Annie Creek, Emu Springs, Northern Territory, Australia, Latitude -13.14 S., Longitude 134.844 E.

Diagnosis: Until now, most herpetologists in Australia have treated *Notoscincus ornatus* (Broom, 1896) as a single wide-ranging species, found from north-east Queensland, across the northern half of Australia to the western Australian coast.

The most notable exception to the preceding was Wells and Wellington (1985), who treated the putative species as three.

This paper herein recognises six species, being as follows:

Notoscincus ornatus (Broom, 1896), type locality Muldiva, north-east Queensland, and a species confined to north-east Queensland, extending west to the Mount Isa region;

N. watjulum (Glauert, 1959), type locality Wotjulum Mission, West Kimberley, Western Australia and apparently restricted to the west Kimberley of Western Australia;

N. watersi Wells and Wellington, 1985, type locality 50 km south of Alice Springs, Northern Territory being a species occurring in the red centre of Australia and nearby arid areas to the north, including the Tanami Desert;

N. flecka sp. nov. from the Pilbara region, Western, Australia, including the subspecies *N. flecka fereflecka subsp. nov*. from the Cape Range area in Western Australia;

N. monodorsa sp. nov. from the top end of the Northern Territory, including a distribution from the western Gulf of Carpentaria across to the East Kimberley in Western Australia;

N. whoa sp. nov. from Groote Eylandt, eastern Northern Territory.

The six species are readily separated from one another by the following suites of characters:

Notoscincus ornatus is separated from the other five species the presence of a silver-grey brownish dorsum of the body, either without spotting or 10-15 well-defined black spots along the mid-dorsal line of the body and others continuing along the dorsal midline of the tail; the flanks are black or mainly black on the top half or slightly more, these being distinctively broken by elongate, thin, light brown blotches, cutting off the black or nearly so, top and bottom, giving a barred appearance along each side, which continues at a lesser intensity beyond the hind limb and onto the tail. Lower flanks are mainly white with darker greyish marbling or mottling. Upper labials are mainly white with dark etching and a slightly brownish tinge.

N. watjulum is separated from the other five species the presence of a silver-grey brownish dorsum of the body, with 8-12 well-defined black spots on the body and others continuing along the dorsal midline of the tail; slightly more than half of the flank, being the upper part has a thick well-defined black stripe, with a well defined top and bottom border and no cross bars of any form (as seen in *N. ornatus*), although in some specimens the upper line is wavy as there are infusions from the dorsum, these rarely forming triangles on the upper surface of the border. This black stripe on either side of the body starts at the snout, runs though they eye, above the axila of the fore-limbs, along the flanks, through the axila of the hind limbs and onto the tail, where it both diffuses and some barring forms across the black stripe.

Beneath this dark stripe on either side is a well defined white border, below which is only limited greyish flecks or mottling. The anterior upper labials are greyish or brown.

N. watersi is separated from the two preceding species by having upper flanks that are mainly brownish in colour, being a medium chocolate brown, with evenly spaced, vertically elongate, dark brown spots. The whitish lower flanks are similarly infused meaning the distinction between the two zones in terms of colour contrast is less. Between the upper and lower parts of the flanks as just described is a bold but broken thin white line that commences below the eye, extends over the forelimb, onto the flank and through the hind-limb onto the anterior tail.

The dorsum of this species is brown on top with three rows of medium to large, dark brown spots running longitudinally down the body, with the middle of these (on the dorsal midline) extending onto the tail and about half its length. The chocolate-brown upper surface of the head is heavily peppered or flecked with dark grey. Anterior upper labials are brown.

N. flecka sp. nov. is similar in many respects to *N. watersi* as described above, but differs from that species and the other four species by having limited speckling, peppering or spots on the brown upper surface of the head or anterior snout (versus heavily peppered in *N. watersi*); small rather than medium-sized dorsal spots and dorsal spots that blackish, rather than dark brown; upper flanks that are mainly dark brown to black, but broken by elongate-light brown spots to give a barred appearance; brown anterior upper labials. Upper surfaces of the limbs and the tail are greyish in colour.

N. flecka fereflecka subsp. nov. is separated from nominate *N. flecka sp. nov*. by having upper surfaces of the limbs and the tail that are brownish, rather than greyish and the white line on either side of the lower flank of the tail is prominent, rather than indistinct in *N. flecka sp. nov*..

N. monodorsa sp. nov. is similar in most respects to *N. watjulum* as defined above, but is separated from that taxon by the general absence of a series of spots running down the midline of the dorsum on the body. These spots do commence either near the pelvic girdle and/or from the anterior part of the tail. On some aberrant specimens there are spots on the dorsum, but these are invariably not in a linear form as seen in typical *N. watjulum.* The black line on the upper flank of *N. monodorsa sp. nov.* is reduced in the thickness, meaning it only occupies half, or slightly less of the flank, with the immaculate white line below being more prominent, although there is commonly grey marbling beyond the first part of the white line as one moves towards the venter.

N. whoa sp. nov. is a very different looking lizard to the other five species.

It is a light sandy grey colour on the dorsum with 9-14 medium sized spots running down the midline of the body, which become obscure beyond the pelvic girdle as one moves down the tail towards the distal end.

The dark stripe on the side of the upper flank occupies the top 2/3 and is heavily infused from the top with triangular-shaped cuttings, giving the flanks are barred appearance, the colour of the infusions being the same light grey colour of the dorsum, this same pattering continuing onto the tail, but losing intensity as one moves distally. The dark grey between the light grey infusions is also faded, meaning the lizard as a whole has a faded appearance, which is a contrast to the other species, which do not have the same faded look.

The upper surfaces of the limbs are light grey to whitish, with well defined dark grey markings occupying about 20% of the surface.

The six preceding species, being the entirety of the genus *Notoscincus* Fuhn, 1969 as defined herein, are readily separated from the species *Lineacincus butleri* (Storr, 1979), previously also placed in *Notoscincus*, by having:

1/ A dorsal pattern not consisting of bold alternating dark and light stripes on the dorsum (versus does in *Notoscincus*);

2/ Four (versus 3) supraoculars;

3/ Small ear opening with no ear lobules (vs 2-4 small lobules);

4/ 30 mm snout-vent (adults), versus 40 mm snout-vent in adult *Lineascioncus gen. nov*..

Both *Lineascioncus gen. nov*. and *Notoscincus* are separated from all other Australian skinks by the following suite of characters: Moderate-sized pentadactyle limbs, meeting or overlapping when adpressed; small ear-opening; no supranasals; nasals undivided; large prefrontals in contact or narrowly separated; parietal shields in contact behind the interparietal; lower eyelid totally fused to the upper eyelid to form a permanent spectacle; subdigital lamellae divided (modified from Cogger 2014).

Notoscincus ornatus in life is depicted in Wilson (2015) on page 175, second from bottom and online at:

https://www.flickr.com/photos/127392361@N04/52197340091/

and

https://www.flickr.com/photos/jackgamblewildlife/18640165530/

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https://www.flickr.com/photos/euprepiosaur/21785415053/

N. watersi in life is depicted in Storr, Smith and Johnstone, (1981: Plate 17.8), being at the bottom right and online at:

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and

https://www.flickr.com/photos/whawha88/9432285267/

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https://www.flickr.com/photos/whawha88/11972139905/

N. flecka sp. nov. is depicted in life online at:

https://www.flickr.com/photos/124699310@N06/42012583624/player/394bba68a1

and

https://reptile-database.reptarium.cz/species?genus=Notoscincus&species=ornatus

and

https://biocache.ala.org.au/occurrences/6a3063d5-694e-4817-a5a6-4a06f42e1d85

N. flecka fereflecka subsp. nov. in life is depicted online at:

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https://www.flickr.com/photos/121210153@N05/13955812648/

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https://www.flickr.com/photos/smacdonald/4508551017/

and

https://www.flickr.com/photos/euprepiosaur/7531671490/

N. whoa sp. nov. is depicted in life online at:

https://australian.museum/blog/amri-news/much-to-discover-collaborative-biodiversity-surveys-in-northern-australia/

The type species for *Lineascioncus gen. nov*. is depicted in life in Cogger (2014) on page 665 and Wilson and Swan (2017) on page 381 at second from bottom on left.

Distribution: The species *N. monodorsa sp. nov.* is found at the tropical top end of the Northern Territory, including a distribution from the western Gulf of Carpentaria in the east, across to the East Kimberley in Western Australia in the west.

Etymology: The scientific name *N. monodorsa sp. nov.* derives from Latin roots and that the dorsum of the body is as a rule just “mono”, or one colour only, with the absence of spots of similar markings in the majority of adult specimens.

NOTOSCINCUS WHOA SP. NOV.

LSIDurn:lsid:zoobank.org:act:D45B5D8C-8A2F-4C4D-B3A7-B3EBAC47085E

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.135941 collected from the Gemco Mining Lease Area, Groote Eylandt, Northern Territory, Australia, Latitude -13.9 S., Longitude 136.433 E.

This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.135287, R.135942 and R.138715 all collected from the Gemco Mining Lease Area, Groote Eylandt, Northern Territory, Australia, Latitude -13.9 S., Longitude 136.433 E.

Diagnosis: Until now, most herpetologists in Australia have treated *Notoscincus ornatus* (Broom, 1896) as a single wide-ranging species, found from north-east Queensland, across the northern half of Australia to the western Australian coast.

The most notable exception to the preceding was Wells and Wellington (1985), who treated the putative species as three.

This paper herein recognises six species, being as follows:

Notoscincus ornatus (Broom, 1896), type locality Muldiva, north-east Queensland, and a species confined to north-east Queensland, extending west to the Mount Isa region;

N. watjulum (Glauert, 1959), type locality Wotjulum Mission, West Kimberley, Western Australia and apparently restricted to the west Kimberley of Western Australia;

N. watersi Wells and Wellington, 1985, type locality 50 km south of Alice Springs, Northern Territory being a species occurring in the red centre of Australia and nearby arid areas to the north, including the Tanami Desert;

N. flecka sp. nov. from the Pilbara region, Western, Australia, including the subspecies *N. flecka fereflecka subsp. nov*. from the Cape Range area in Western Australia;

N. monodorsa sp. nov. from the top end of the Northern Territory, including a distribution from the western Gulf of Carpentaria across to the East Kimberley in Western Australia;

N. whoa sp. nov. from Groote Eylandt, eastern Northern Territory.

The six species are readily separated from one another by the following suites of characters:

Notoscincus ornatus is separated from the other five species the presence of a silver-grey brownish dorsum of the body, either without spotting or 10-15 well-defined black spots along the mid-dorsal line of the body and others continuing along the dorsal midline of the tail; the flanks are black or mainly black on the top half or slightly more, these being distinctively broken by elongate, thin, light brown blotches, cutting off the black or nearly so, top and bottom, giving a barred appearance along each side, which continues at a lesser intensity beyond the hind limb and onto the tail. Lower flanks are mainly white with darker greyish marbling or mottling. Upper labials are mainly white with dark etching and a slightly brownish tinge.

N. watjulum is separated from the other five species the presence of a silver-grey brownish dorsum of the body, with 8-12 well-defined black spots on the body and others continuing along the dorsal midline of the tail; slightly more than half of the flank, being the upper part has a thick well-defined black stripe, with a well defined top and bottom border and no cross bars of any form (as seen in *N. ornatus*), although in some specimens the upper line is wavy as there are infusions from the dorsum, these rarely forming triangles on the upper surface of the border. This black stripe on either side of the body starts at the snout, runs though they eye, above the axila of the fore-limbs, along the flanks, through the axila of the hind limbs and onto the tail, where it both diffuses and some barring forms across the black stripe.

Beneath this dark stripe on either side is a well defined white border, below which is only limited greyish flecks or mottling. The anterior upper labials are greyish or brown.

N. watersi is separated from the two preceding species by having

upper flanks that are mainly brownish in colour, being a medium chocolate brown, with evenly spaced, vertically elongate, dark brown spots. The whitish lower flanks are similarly infused meaning the distinction between the two zones in terms of colour contrast is less. Between the upper and lower parts of the flanks as just described is a bold but broken thin white line that commences below the eye, extends over the forelimb, onto the flank and through the hind-limb onto the anterior tail.

The dorsum of this species is brown on top with three rows of medium to large, dark brown spots running longitudinally down the body, with the middle of these (on the dorsal midline) extending onto the tail and about half its length. The chocolate-brown upper surface of the head is heavily peppered or flecked with dark grey. Anterior upper labials are brown.

N. flecka sp. nov. is similar in many respects to *N. watersi* as described above, but differs from that species and the other four species by having limited speckling, peppering or spots on the brown upper surface of the head or anterior snout (versus heavily peppered in *N. watersi*); small rather than medium-sized dorsal spots and dorsal spots that blackish, rather than dark brown; upper flanks that are mainly dark brown to black, but broken by elongate-light brown spots to give a barred appearance; brown anterior upper labials. Upper surfaces of the limbs and the tail are greyish in colour.

N. flecka fereflecka subsp. nov. is separated from nominate *N. flecka sp. nov*. by having upper surfaces of the limbs and the tail that are brownish, rather than greyish and the white line on either side of the lower flank of the tail is prominent, rather than indistinct in *N. flecka sp. nov*..

N. monodorsa sp. nov. is similar in most respects to *N. watjulum* as defined above, but is separated from that taxon by the general absence of a series of spots running down the midline of the dorsum on the body. These spots do commence either near the pelvic girdle and/or from the anterior part of the tail. On some aberrant specimens there are spots on the dorsum, but these are invariably not in a linear form as seen in typical *N. watjulum.* The black line on the upper flank of *N. monodorsa sp. nov.* is reduced in the thickness, meaning it only occupies half, or slightly less of the flank, with the immaculate white line below being more prominent, although there is commonly grey marbling beyond the first part of the white line as one moves towards the venter.

N. whoa sp. nov. is a very different looking lizard to the other five species.

It is a light sandy grey colour on the dorsum with 9-14 medium sized spots running down the midline of the body, which become obscure beyond the pelvic girdle as one moves down the tail towards the distal end.

The dark stripe on the side of the upper flank occupies the top 2/3 and is heavily infused from the top with triangular-shaped cuttings, giving the flanks are barred appearance, the colour of the infusions being the same light grey colour of the dorsum, this same pattering continuing onto the tail, but losing intensity as one moves distally. The dark grey between the light grey infusions is also faded, meaning the lizard as a whole has a faded appearance, which is a contrast to the other species, which do not have the same faded look.

The upper surfaces of the limbs are light grey to whitish, with well defined dark grey markings occupying about 20% of the surface.

The six preceding species, being the entirety of the genus *Notoscincus* Fuhn, 1969 as defined herein, are readily separated from the species *Lineacincus butleri* (Storr, 1979), previously also placed in *Notoscincus*, by having:

1/ A dorsal pattern not consisting of bold alternating dark and light stripes on the dorsum (versus does in *Notoscincus*);

2/ Four (versus 3) supraoculars;

3/ Small ear opening with no ear lobules (versus2-4 small ear lobules);

4/ 30 mm snout-vent (adults), versus 40 mm snout-vent in adult *Lineascioncus gen. nov*..

Both *Lineascioncus gen. nov*. and *Notoscincus* are separated from all other Australian skinks by the following suite of characters: Moderate-sized pentadactyle limbs, meeting or overlapping when adpressed; small ear-opening; no supranasals; nasals undivided; large prefrontals in contact or narrowly separated; parietal shields in contact behind the interparietal; lower eyelid totally fused to the upper eyelid to form a permanent spectacle; subdigital lamellae divided (modified from Cogger 2014).

Notoscincus ornatus in life is depicted in Wilson (2015) on page 175, second from bottom and online at:
https://www.flickr.com/photos/127392361@N04/52197340091/
and
https://www.flickr.com/photos/jackgamblewildlife/18640165530/

N. watjulum in life is depicted online at:
https://www.flickr.com/photos/chrisjolly1989/38426733851/
and
https://www.flickr.com/photos/reptileshots/51284555563/
and
https://www.flickr.com/photos/euprepiosaur/21785415053/

N. watersi in life is depicted in Storr, Smith and Johnstone, (1981: Plate 17.8), being at the bottom right and online at:
https://www.flickr.com/photos/euprepiosaur/7238436268
and
https://www.flickr.com/photos/smacdonald/5718360226/
and
https://www.flickr.com/photos/whawha88/9432285267/
and
https://www.flickr.com/photos/whawha88/11972139905/

N. flecka sp. nov. is depicted in life online at:
https://www.flickr.com/photos/124699310@N06/42012583624/player/394bba68a1
and
https://reptile-database.reptarium.cz/species?genus=Notoscincus&species=ornatus
and
https://biocache.ala.org.au/occurrences/6a3063d5-694e-4817-a5a6-4a06f42e1d85

N. flecka fereflecka subsp. nov. in life is depicted online at:
https://biocache.ala.org.au/occurrences/d0ebd331-8a3c-4a89-8879-b95931c2724c

N. monodorsa sp. nov. is depicted in life in Cogger (2014) on page 666 at top and online at:
https://www.inaturalist.org/observations/104023848
and
https://www.flickr.com/photos/121210153@N05/13955812648/
and
https://www.flickr.com/photos/smacdonald/4508551017/
and
https://www.flickr.com/photos/euprepiosaur/7531671490/

N. whoa sp. nov. is depicted in life online at:
https://australian.museum/blog/amri-news/much-to-discover-collaborative-biodiversity-surveys-in-northern-australia/

The type species for *Lineascioncus gen. nov*. is depicted in life in Cogger (2014) on page 665 and Wilson and Swan (2017) on page 381 at second from bottom on left.

Distribution: The species *N. whoa sp. nov.* is apparently confined to Groote Eylandt, in the north-east of the Northern Territory, Australia.

Etymology: The scientific name *N. whoa sp. nov.* derives from custom of local Aboriginal children of the Anindilyakwa tribe who yell out "*whoa*" as they grab these lizards scuttling across the ground.

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CONFLICT OF INTEREST

None.