

A review of the *Candoia bibroni* species complex (Squamata: Serpentes: Candoiidae: *Candoia*).

RAYMOND T. HOSER

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

Received 12 April 2016, Accepted 20 May 2016, Published 1 August 2016.

ABSTRACT

The Pacific Boas, genus *Candoia* Gray, 1842, have been subject of intense taxonomic scrutiny in recent years.

This has included dissections of the three widely recognized putative species. *Candoia carinata* has been most recently split into three full species and a total of ten regionally distinct subspecies (Smith *et al.* 2001). *C. aspera* split into three subspecies (Hoser, 2013) and *C. bibroni* has long been recognized as consisting of two named subspecies, although one of the used names has been misapplied by various authors and is in fact probably a *nomen nudem*.

Taxonomic treatments of the genus (e.g. McDowell 1979) and molecular treatments of the genus (e.g. Austin 2000) have tended to uphold these divisions and shown clearly that if anything, the taxonomic diversity of the group has been grossly understated.

Hoser 2013, utilized these results and formally described *Candoia aspera iansimpsoni*, this being the most recent addition to the genus. Furthermore, by using existing available nomenclature Hoser (2013) placed each of the three well-known putative species into subgenera.

Hoser (2013) also for the first time moved all species into the newly erected family Candoiidae Hoser, 2013 as distinct from the Boidae.

This paper is a result of drawing on these facts, and available specimens of the putative species *C. bibroni*, to create a taxonomy that more properly reflects the morphology and phylogeny.

The complex has been divided into eleven species and one subspecies; all except *C. bibroni* named for the first time.

The division is along obvious morphological and geographical lines and each population is clearly genetically distinct and isolated. By simple analysis they are all significantly divergent. They are therefore evolving as species in the ordinary sense of the word and should be treated as such.

The taxonomy is robust and conservative and in its entirety, in every case reflects recent "splits" of species across the exact same geographical barriers, likely to be affected by the same factors.

This forms a necessary first step to preserving potentially threatened populations, which by virtue of their insular nature, must be treated as vulnerable.

Furthermore it appears that the factor limiting the westward spread of the *C. bibroni* complex in the Solomon Islands has been the Brown Tree Snake, *Boiga irregularis* (Bechstein, 1802).

Keywords: Taxonomy; Pacific Boa; snakes; genus; *Candoia*; *bibroni*; *carinata*; *aspera*; *paulsoni*; *iansimpsoni*; *superciliosa*; *schmidti*; *australis*; species; Fiji; Lau Islands; Loyalty Islands; Solomon Islands; Solomons; Rennell, Bellona; San Cristobal; Reef islands; Banks Islands; Tokelau; Samoa; Wallis; Futuna; Rotuma; Kandavu; Vanuatu; New Caledonia; new species; *hoserae*; *woolfi*; *kimmooreae*; *malcolmmaclurei*; *boutrosi*; *Niraikanukiwai*; *Georgemacintyre*; *louisemcgoldrickae*; *simonmccgoldricki*; *jamiekonstandinou*; new subspecies; *georgekonstandinou*.

INTRODUCTION

The Pacific Boas, genus *Candoia* Gray, 1842, have been subject of intense taxonomic scrutiny in recent years (e.g. (Smith *et al.* 2001, Hoser 2013).

This has included dissections of the three widely recognized putative species. *Candoia carinata* has been most recently split into three full species and a total of eleven regionally distinct subspecies (Smith *et al.* 2001). *C. aspera* into three subspecies (Hoser, 2013) and *C. bibroni* has long been recognized as consisting of two named subspecies, although one of the used names has been misapplied and is in fact a *nomen nudem*.

Taxonomic treatments of the genus (e.g. McDowell 1979) and molecular treatments of the genus (e.g. Austin 2000) have tended to uphold these divisions and shown clearly that if anything, the taxonomic diversity of the group has been understated as compared to taxonomic treatments of other reptiles across the same biogeographical realm.

Hoser 2013, utilized these results and formally described *Candoia aspera iansimpsoni*, this being the most recent addition to the genus. Furthermore, by using existing available nomenclature Hoser (2013) placed each of the three well-known putative species into subgenera.

Hoser (2013) also for the first time moved all species into the newly erected family Candoiidae Hoser, 2013.

This paper goes further, by drawing on these facts, and available specimens of the putative species *C. bibroni*, to marry what is known of the morphology of local populations with what's known from relevant molecular studies and filling in the blanks with relevant geological evidence in terms of land bridges and the like which could aid shifts in populations and specimens to create a taxonomy that more properly reflects the morphology and phylogeny.

The complex has been divided into eleven species; all except for *C. bibroni* are named for the first time.

They are separated along obvious morphological and geographical lines, the latter shown to be major phylogeographic barriers for reptiles in other molecular studies such as Austin (2000), Keogh *et al.* (2008) and others.

It is self evident that they are therefore evolving as species in the ordinary sense of the word and should be treated as such.

An additional subspecies is also named.

The taxonomy presented here is robust and conservative and a necessary first step to preserving potentially threatened populations, which by virtue of their insular nature and ongoing human pressures on the relevant islands, must be treated as vulnerable.

Notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011 (Court of Appeal Victoria 2014 and VCAT 2015) and not returned in breach of various earlier court orders, I have made a decision to publish this paper in view of the conservation significance attached to the formal recognition of unnamed species. I also note that further delays may in fact put these otherwise unnamed taxa at greater risk of extinction.

MATERIALS AND METHODS

These are not formally explained in a number of my recent papers under the heading "Materials and methods" or similar, on the basis they are self evident to any vaguely perceptive reader. However, the process by which the following taxonomy and nomenclature in this and other recent papers by myself of similar form, has been arrived at, is explained herein for the benefit of people who have recently published so-called "criticisms" online of some of my recent papers at the non-peer reviewed website "Facebook". They have alleged a serious "defect" by myself not formally explaining "Materials and methods" under such a heading.

The process involved in creating the final product in terms of taxonomy and nomenclature for this and other relevant papers in

issues 1-32 of *Australasian Journal of Herpetology* has been via a combination of the following:

Genera and component species are audited to see if their classifications are correct on the basis of known type specimens, locations and the like when compared with known phylogenies and obvious morphological differences between like species.

Original descriptions and contemporary concepts of the species are matched with available specimens from across the ranges of the species to see if all conform to accepted norms.

These may include those held in museums, private collections, collected in the field, photographed, posted on the internet or held by individuals.

This is obviously only done when the location data is good and when applicable, other relevant data that is available is also used.

Where specimens do not appear to comply with the described species (and accepted concept of the species), this non-conformation is looked at with a view to ascertaining if it is worthy of taxonomic recognition or other relevant considerations on the basis of differences that can be tested for antiquity or deduced from earlier studies.

When this appears to be the case (non-conformation), the potential target taxon is inspected as closely as practicable with a view to comparing with the nominate form or forms if other similar taxa have been previously named.

Other relevant data is also inspected, including any available molecular studies, geological data and the like which may indicate likely divergence of populations.

Where molecular studies are unavailable for the relevant taxon or group, other studies involving species and groups constrained by the same geographical or geological barriers, or with like distribution patterns are inspected as they give reasonable indications of the likely divergences of the taxa being studied herein.

Additionally other studies involving geological history, sea level and habitat changes associated with long-term climate change, including recent ice age changes in sea levels, versus known sea depths are utilized to predict past movements of species and genus groups in order to further ascertain likely divergences between extant populations (as done in this very paper).

When all available information checks out to show taxonomically distinct populations worthy of recognition, they are then recognized herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This means that if a name has been properly proposed in the past, it is used. This is exactly what happens in this paper for the taxon originally described as *Enygrus bibroni* Duméril and Bibron, 1844.

Alternatively, if no name is available, one is proposed according to the rules of the Code as is done numerous times in this paper.

As a matter of trite I mention that if a target taxon or group does check out as being "in order" or properly classified, a paper is usually not published unless some other related taxon is named for the first time.

The published literature relevant to the taxonomic judgements made within this paper includes papers relevant to Solomon Islands and other south-west Pacific Island species affected by the same physical barriers to dispersion. They detail phylogenetic differences between similar taxa from nearby island groups, dispersal dates and the like, geological factors and the like and material directly relevant to *Candoia*. Combined, they include the following:

Adler, *et al.* (1995), Austin (2000), Austin *et al.* (2010), Balsai (1995), Barbour (1921), Bauer (1999), Bauer and Sadler (2000), Bauer and Vindum (1990), Böhme *et al.* (2002), Boulenger (1884, 1885, 1886, 1890, 1893, 1897), Brongniart (1800), Brown

(1991), Bruns *et al.* (1989), Cogger (1972), Colvée and Weffer (2004), Colvée and Martin (2005), Dahl (1986), Daza *et al.* (2015), de Rooij (1917), Duméril and Bibron (1839, 1844), Duméril and Duméril (1851), Forcart (1951), Garman (1901), Gill (1993, 1995), Gray (1856), Greer (1982), Greer and Parker (1967), Greer and Simon (1982), Hagen *et al.* (2012), Hall (2002), Hamilton *et al.* (2010), Harvey *et al.* (2000), Higgins (1943), Hoser (2013), Ineich (2008, 2009, 2011), Iskandar and Erdelen (2006), Jacquinet and Guichenot (1853), Keith and Marquet (2006, 2007), Keith *et al.* (2008, 2011), Keogh *et al.* (2003, 2008), Kinghorn (1928, 1937), Koch *et al.* (2009), Mayr (1931), McCoy (1980, 2006), McDiarmid *et al.* (1999), McDowell (1970, 1979), Medway (1974), Mertens (1928, 1931), Montrouzier (1860), Morrison (2003), Mys (1988), Ogilby (1890), Oxley (2016), Ota *et al.* (1998), Parker (2012), Pianka and Vitt (2003), Pyron *et al.* (2013), Rahmstorf (2003), Reeder (2003), Richmond *et al.* (2014), Rittmeyer and Austin (2015), Robinson (1974), Roemmich (2007), Roux (1913), Russell and Coupe (1984), Sadler and Bauer (1997), Schmidt (2010), Schmidt (1932), Schmidt and Burt (1930), Schweizer (1970), Sibley and Monroe (1990), Wells and Wellington (1985), Williams and Parker (1964), Zug (2012a, 2012, 2013) and sources cited therein.

These papers combined with the findings of McDowell (1979) in terms of morphological divergences in populations, make the argument in favour of splitting the main populations within the *C. bibroni sensu lato* group into full species as opposed to mere subspecies as would otherwise conservatively be the case (see also below).

Some material within descriptions below is repeated for different described taxa and this is in accordance with the provisions of the *International Code of Zoological Nomenclature* and the legal requirements for each description. I make no apologies for this.

RESULTS

A number of my recent taxonomic papers do not list any results as such under any such heading.

This is because the descriptions that follow the introduction are in fact the results and the outcome arising from these.

The relevant evidence is the animals themselves and from a taxonomic standpoint, the relevant morphological features of them.

Evidence in the form of molecular evidence and geological history can only corroborate the evidence of the animals themselves.

Part of the process of identifying and describing the relevant species or subspecies in this and other papers involves a review of the literature and conclusions drawn by these authors.

I do not necessarily agree with all conclusions of authors in the cited literature and this is usually self-evident when my taxonomic judgements are cross-referenced with the cited papers and the like.

Some authors have clearly made similar taxonomic judgements to myself and others have not.

In the case of my review of the available data, I do herein note a general concurrence in my conclusions from those inferred by McDowell (1979) and Austin (2000) in terms of the species *Candoia bibroni* (Duméril and Bibron, 1844) in that there should be at least two species recognized (see also Zug 2013), one being primarily from the west of the range and the other from the east.

The depth of the divergences is also corroborated by the findings of Hamilton *et al.* (2010), who significantly left *Candoia* out of their results, because they presumably had the belief that specimens on either side of their barrier (the so-called Cheesman's line) were of the same species.

It is in the light of the combined evidence available here, previously unavailable to previous authors on which the current taxonomic and nomenclatural judgements published herein are made.

Hamilton *et al.* (2010) also provide evidence contrary to the view that *Candoia bibroni sensu lato* originated from the Fiji region, dispersing outwards in most directions, indicating that the founder stock may have originated in the Solomon Islands and moved south-east over a substantial time frame by vicariance as much as dispersal.

Sea currents and land mass evidence from glacial maxima also indicate a dispersal eastwards from the Solomons and then south-west from the general vicinity of Samoa, Wallis and Futuna towards Fiji and beyond.

The name *Candoia australis* (Montrouzier, 1860), treated by many authors as either a synonym for *C. bibroni*, (originally named *Boa australis* Montrouzier, 1860) or a subspecies, is not available for any species or subspecies described herein. McDowell (1979) wrote of this alleged taxon: "Montrouzier reported his *Boa australis* to come from New Caledonia, where there are no known terrestrial snakes and his description seems quite unidentifiable."

I note also that the application of the name to the Solomon Islands population by authors in the past century following on from an error by Boulenger also has no tenable basis of fact or availability under the rules of the various editions of Codes of Zoological Nomenclature (e.g. Ride *et al.* 1999).

In terms of this nomenclatural problem, McDowell (1979) wrote: "Just how Boulenger attached Montrouzier's name, based on a color description without scale counts and without known preserved- types, to the form with high ventral count has never been explained, for Montrouzier reported his *Boa australis* to come from New Caledonia, where there are no known terrestrial snakes and his description seems quite unidentifiable."

In other words *Boa australis* Montrouzier, 1860 is at this point in time clearly a *nomen nudem*.

In the alternative, if *Boa australis* Montrouzier, 1860 is not a *nomen nudem*, as first revisor, I hereby restrict the taxon to the type locality, New Caledonia, where no specimens occur.

Also of note is the ultra conservative treatment of the various described taxa.

While two species groups are identified within the *C. bibroni* complex herein (as identified by McDowell 1979 and Zug 2013), I have taken the view that each of the divergent forms within each group should be treated as full species as done below.

The two main groups of species are what I call the *C. bibroni* group from the east and north-east of the range, and the *C. hoserae* sp. nov. group from the north-west of the range.

Diagnostic of the *C. hoserae* sp. nov. group of species is that the *C. hoserae* sp. nov. group is separated from the *C. bibroni* group, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In the *C. bibroni* group of species the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Of note also is that a reassessment of published records and museum specimens indicates that the *C. bibroni* complex is not as widespread as reported in a lot of the literature.

There is currently no evidence the group occurs on any of Tokelau, Tonga, the lower New Hebrides or New Caledonia.

These islands are also biogeographically separated from the islands where the complex is known to occur.

AN EXPLANATION OF THE PRESENT DAY DISTRIBUTION OF THE *CANDOIA BIBRONI* SPECIES COMPLEX.

Previous authors such as McDowell, 1979 appeared to have difficulty explaining the extant distribution of the complex.

McDowell wrote:

“the distribution of *C. bibroni* appears to centre around the Pandora (or North Fiji) Basin, with a northeastward extension to Samoa, a southwestward extension to the Loyalty Islands, and northwestward extensions to Rennell and San Cristobal. However, it appears impossible to fit the distribution of the species to any known feature of submarine topography. Thus, the New Hebrides Trench has not prevented *C. bibroni* from reaching the Loyalty Islands, yet the species does not extend to New Caledonia (not separated from the Loyalty Islands by any submarine barrier). *C. bibroni* reaches San Cristobal at the eastern end of the Solomons Ridge, but not the adjacent Guadalcanal or Malaita, on the same ridge; *C. bibroni* also reaches Rennell Island, on the eastern end of the Rennell Ridge (essentially continuous with the Louisiade Rise) but does not extend to the Louisiade Archipelago. In extending to Samoa, *C. bibroni* crosses the Tonga Trench and leaves the Melanesian Plateau.”

To this extent, McDowell has identified the known range of the complex, but without identifying the means of dispersal.

A check of the geological history of the relevant island groups indicates at least 11 populations that have never been in land contact with one another meaning that the snakes must have either swam, or more likely “rafted” between the relevant land masses.

This is relatively simple over a geological time frame measured in the millions of years when one looks at the prevailing sea currents in the region. The entire distribution of the *C. bibroni* complex clearly corresponds to the flow of the Equatorial Countercurrent and the South Pacific Gyre as detailed by Rahmstorf (2003), Roemmich (2007) and D’Hondt *et al.* (2009).

In fact it doesn’t seem necessary to identify where the snakes originated, as the South Pacific Gyre would clearly transport rafting snakes to all known localities.

Having said this, based on the morphological evidence of McDowell and the distributional evidence for *Candoia* as a whole, centred on the islands north of New Guinea, including those accreted to it in the last few million years, it would appear that the *Candoia bibroni* group had its origins in the Solomon Islands rather than Fiji.

Alternatively, if Fiji is the point of origin for the three species groups, then Fijian animals most likely founded all the other putative species, including the *C. hoseae* sp. nov. group within *C. bibroni sensu lato*.

The molecular evidence of Austin (2000) also demonstrates that the relevant snakes had clearly been able to raft across significant bodies of water in order to colonise the relevant island groups some millions of years ago, from where the populations have evolved more-or-less independently ever since.

The southern migration of the *C. bibroni* complex was almost certainly limited by temperature, in that the climate further south was simply unsuitable for these particular snakes.

Hence these snakes are not found in places like New Zealand or Norfolk Island.

The factor keeping the snakes from colonising New Caledonia is not emphatically known, although it seems to apply to other species groups from the same distributional realm as *C. bibroni sensu lato*, implying the local sea currents may exclude passage to the island, even though the nearby Loyalty Islands group were reached.

However the factor keeping the *Candoia bibroni* complex from colonising any parts of tropical or eastern Australia, the western parts of the Solomon Islands and the Louisiade Archipelago is in my view clearly obvious.

These areas are inhabited with a highly invasive, nocturnal predatorial tree snake in the form of the Brown Tree Snake *Boiga irregularis* (Bechstein, 1802).

These snakes, which live in high densities, clearly must have

prevented rafting *C. bibroni* complex snakes from establishing. Both species share the same ecological niche and nocturnal habits and would clearly compete directly for food. *B. irregularis* would have a direct competitive advantage in that their cannibalistic and reptile eating habits are well known as is their ability to live in high density and so overwhelm less numerous competing species.

Based on available evidence of distribution, these factors imply an overwhelming advantage over slower moving more heavy bodied snakes in the same ecospace. With sea currents in the Solomons running east to west as part of the well-established “Indonesian throughflow”, cross island colonisation of *C. bibroni* complex snakes through the Solomon Islands should have been a mere formality, noting the cross sea distances to be rafted were insignificant compared with those traversed in the south Pacific. The same applies for the islands of the Louisiade Archipelago.

This means that in the absence of some particularly effective predator on the other islands, the *C. bibroni* complex snakes would have become established throughout the relevant archipelagos.

The only predatory species in the same ecospace which appears to have a distribution that in total excludes *C. bibroni sensu lato* is *B. irregularis*.

Hoser (1995), detailed how *B. irregularis* effectively caused the elimination of *Hoplocephalus bungaroides* (Schlegel, 1837) from areas north of Sydney harbour. The two species occupied identical habitats where they occur in the Sydney basin, but by being mutually exclusive.

With *B. irregularis* the more recent immigrant to the region, we know emphatically that these snakes have successfully eliminated *H. bungaroides* from sandstone areas in Sydney’s north.

The molecular evidence of Richmond *et al.* (2014) confirmed that *B. irregularis sensu lato* migrated from west to east in the recent geological past, this migration encompassing a region generally bound by Sulawesi in the West and Malaita and Guadalcanal in the east of the Solomon Islands. Notably, it is the next major island to the south-east, namely Makira (AKA San Cristobal) where *Candoia bibroni* complex makes its last stand. In this general vicinity on other islets, uninhabited by *B. irregularis*, and islands to the east and south, also uninhabited by *B. irregularis*, *C. bibroni* complex snakes occur and in abundance.

The division of the Solomon Islands into a western and central sector with *B. irregularis* and a mutually exclusive eastern zone with *C. bibroni* complex snakes is seen in the distribution information for *B. irregularis* and “*C. bibroni*” in McCoy 2006.

There he lists *B. irregularis* as being found in the following places: “Maluku (Moluccas), Sulawesi, New Guinea and adjacent archipelagos, Australia, Solomon Islands. There is also an introduced population on Guam which has exterminated a number of species of native birds on that island. In the Solomons: Bougainville, Shortland, Mono, Choiseul, Ranongga, Vella Lavella, New Georgia, Tetepare, Vangunu, Isabel, Guadalcanal, Ngela, Malaita.”

For the species “*C. bibroni*” he lists the mutually exclusive distribution of “Solomon Islands, Vanuatu, Loyalty Islands, Fiji Islands, Tokelau Islands, Wallis and Futuna, the Samoas, Tonga. In the Solomons: Rennell, Makira, Ugi, Olu Malau, Santa Ana, Santa Cruz, Reef Islands, Vanikoro, Utupua.”

No one, including McCoy, have until now picked up on this mutually exclusive distribution by two species that share a near identical ecological niche.

That this has been overlooked until now is somewhat surprising, especially considering the effect *B. irregularis* has had on Guam, where it was introduced inadvertently and has caused problems ever since as noted by Rodda and Fritts (1992), Rodda and Savidge (2010) and Rodda *et al.* (1999).

Likewise in terms of the Louisiade Archipelago, where McDowell noted the absence of "*C. bibroni*". de Rooij (1917), lists *B. irregularis* as occurring in the Louisiade Archipelago and other nearby islands off the south-east coast of New Guinea, all of which conspicuously lack "*C. bibroni*".

McDowell (1979), spent considerable effort looking in the direction of another species of snake affecting the distributional limits of "*C. bibroni*" in the Solomon Islands and to this effect he spent his efforts looking at the congeneric *C. carinata* (Schneider, 1801) and not surprisingly he drew a blank in terms of any hard evidence implicating that species.

It is prudent for me to copy a sizeable chunk of his paper here to see the basis of his analysis and why he drew a blank in the end in terms of implicating the species *C. carinata* restricting the range or habits of "*C. bibroni*".

McDowell (1979) wrote:

"Over much of its range, *C. bibroni* is either the only snake in the land fauna (Banks Islands, New Hebrides, Samoa, and probably much of eastern Fiji) or is accompanied by a single form obviously adapted to feeding on very small prey (Loyalty Islands, where *Typhlina willeyi* occurs; larger Fiji Islands, where *Ogmodon vitianus* occurs). It should be noted that of the four cases of murid remains in the stomach of my material of *C. bibroni*, two were from the New Hebrides (AMNH 81597, Aoba I.; 81589, Maewo I.) and the others from Fiji (AMNH 40439, Viwa I.; 40451, Vomo I.) It seems possible, therefore, that *C. bibroni* becomes more terrestrial in its foraging in regions where *C. carinata* does not occur.

It must be emphasised that my data are far too meagre to establish a character displacement in behavior, and in morphology, where my data are more extensive, there is no evidence of a "character displacement" in either *C. bibroni* or *C. carinata*, at least no evidence that would fulfill the rigorous requirements of Grant (1972). It is true that western ("Long-tailed") *C. carinata* are more like *C. bibroni* than are eastern ("short-tailed") *C. carinata*, particularly in such features as wide separation of the postorbital from the frontal bone, high subcaudal count, somewhat lower tooth counts (than in eastern *C. carinata*, but still above those of *C. bibroni*), and frequent occurrence of a striped color phase suggestive of some phases of *C. bibroni*. However, the geographic range of the eastern form of *C. carinata* far exceeds the overlap of that form with *C. bibroni* (an overlap confined, so far as known, to San Cristobal and nearby Ugi, Bio, Santa Ana, and Three Sisters Islands, to the Santa Cruz Islands, and Rennell and Bellona). I can see no indication, for example, that *C. carinata* from Guadalcanal, where *C. bibroni* does not occur, are any less-or any more-different from *C. bibroni* than are *C. carinata* from San Cristobal.

So far as variation in *C. bibroni* is concerned, there is nothing to indicate that the populations sympatric with *C. carinata* are morphologically more different from that species than are populations from islands where *C. carinata* does not occur; if anything, there may be some character convergence. Thus, in Fiji and New Hebrides *C. bibroni* the premaxilla has the "typical boine" form of Frazzetta (1959; 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but eastern Solomons *C. bibroni* are like *C. carinata* (with which they are sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla. Again, the highest tooth counts in *C. bibroni* are in specimens from the eastern Solomons and the small size of the vomerine foramen of eastern Solomons *C. bibroni* is a departure from Fiji and New Hebrides specimens and a resemblance to the majority of *C. carinata* skulls. It may be added that the material available to me shows no significant (at 5 percent level) departure of *C. bibroni* from a 1:1 sex ratio or any significant differences in sex ratio from island to island. It is noteworthy that on San Cristobal (and also Guadalcanal) *C. carinata* shows at least a close approximation to a 1:1 sex ratio, with the greatest

preponderance of females over males occurring in the new Georgia Group of the Solomons, where *C. bibroni* does not occur.

If one can judge from the collections of the Whitney South Sea Expedition, the presence of one species of *Candoia* would seem to have no depressing effect on the abundance of the other. The largest collection of *C. bibroni* taken by that expedition was that from San Cristobal, where 18 were taken; the same expedition took 19 *C. carinata* on San Cristobal, the largest collection of that species from a single island made by the Whitney South Sea Expedition."

I also note here that McDowell also found that the largest numbers of both "*C. bibroni*" and *C. carinata* were found on San Cristobal which happens to be the only major island in the Solomons without *Boiga irregularis*, indicating that the tree snake species also has a depressing effect in numbers of *C. carinata* as well as "*C. bibroni*".

As to why *C. carinata sensu lato* and the third species complex within *Candoia*, namely *Candoia aspera* (Günther, 1877) could survive in areas inhabited by *Boiga irregularis*, including all those Solomon Islands inhabited by *B. irregularis* for *C. carinata sensu lato* (usually referred to as *C. paulsoni* (Stull, 1956) for Solomon specimens), the answer is self-evident.

Unlike *C. bibroni sensu lato*, the other two species groups are relatively stout ground-dwelling snakes, not being obligatory tree dwellers, acting significantly outside the competitive niche of *B. irregularis*.

As to why *Boiga irregularis* is not found on San Cristobal and islands east and south of there, the reason is simple and again relates to the prevailing sea currents.

The prevailing current in the region is the well-established "Indonesian throughflow", which flows east to west and thereby forms a so-called headwind against eastward migration of *B. irregularis* by any form of rafting.

All the islands colonised by *B. irregularis* in the Solomons fit one of the following profiles:

1/ The islands were joined in ice-age minima into a single land bridge and so were easily crossed by the invasive snakes, which effectively traversed land bridges and/or proximal islands from greater New Guinea, these land bridges detailed by Hagen *et al.* (2012) and others, including a direct line of connection from Bougainville to Ngela via joined islands in between. I note here that Ngela is directly proximal to the permanently separated Guadalcanal, the two islands split by a very narrow strait.

2/ The other islands colonised, (e.g. the New Georgia group), while never connected by land to the other Solomon Islands invaded by *B. irregularis*, effectively sat downcurrent from more easterly islands that could be colonised via the above-referred to land bridge/s (e.g. Ngela/Guadalcanal) via rafting.

The significance of the exclusionary competitiveness of a Colubrid (*B. irregularis*) to a Candoiid (*C. bibroni sensu lato*) cannot be understated in terms of the study of modern ecosystems and I suspect it is far more common than has been previously suspected across other regions.

Hoser (2014) found the species *Acanthophis pyrrhus* (Boulenger, 1898), to successfully exclude and/or eliminate Pilbara Death Adders *Acanthophis wellsei* Hoser, 1998 from areas they may otherwise cohabit.

Hoser (2014) also confirmed that long term separation of *A. wellsei* caused by intervening populations of *A. pyrrhus* also caused a speciation process to occur in the former, as each population was isolated from one another and currently treated as allopatric subspecies.

The situation of competitive species forming effective barriers to gene flows in other taxon populations to allow speciation to occur, appears to have been largely unexplored in herpetology as a means to find new species. If pursued as a line of enquiry, there is no doubt that more cryptic species of reptile will be found.

THE FORMATION OF THE TAXONOMIC JUDGEMENTS WITHIN THIS PAPER

As noted by McDowell (1979) and further ascertained by myself since, putative *C. bibroni* are morphologically distinct within the various island groups they are found.

What McDowell (1979) and it seems all authors since him have failed to do, is to try to assess these differences with a view to establishing a taxonomy for the complex. Or if changes in taxonomy are indicated by the evidence, the authors have failed to take the logical next step.

Zug (2013) used McDowell's results to state "Subtle skeletal differences hint that *C. bibroni* might consist of two species, a central Pacific one and a Vanuatu-Solomon Islands one".

Austin (2000) wrote: "Both samples of *C. bibroni* in this study (n = 3) come from the eastern portion of the range (Fiji and Samoa) and thus presumably represent only one form of McDowell's postorbital bone division. Nevertheless, these samples show over 6% sequence divergence. Sampling populations from the western portion of the range in the future may show levels of divergence indicative of specific differentiation within *C. bibroni*."

Of course, many species have been divided on far less than a 6% sequence divergence (e.g. Scrub Python (*Australiasis* Wells and Wellington, 1985) species as defined by Harvey *et al.* 2000) and so the case is already made by Austin (2000) for the Samoan snakes to be split off as a full species.

For the record, Harvey *et al.* erected the species *Australiasis nauta* (Harvey *et al.*, 2000) on the basis of a maximum 1.4% divergence from nominate *A. amethystina* (Schneider, 1801) and other species were named on similarly low divergences.

With the Solomons Islands *C. bibroni* complex snakes clearly more divergent from the Fiji types, they too need to be redefined as a separate species.

However across the range of putative *C. bibroni* there is nothing to suggest that either the Samoan, Solomons Islands or Fiji (main island/Vita Levu) are any more divergent than those different forms from other island groups such as Wallis and Futuna, Rotuma, Loyalty Islands or Vanuatu, meaning that these groups were also looked at to decide whether or not they should be given taxonomic recognition and at what level.

McDowell (1979) when looking at morphological evidence, stated that it implied parallel evolution of each population over the recent geological past, adding to the case that all significant island group populations should be equally recognized at the same taxonomic level (i.e. as species or subspecies).

There appeared to be at least eleven main geographically isolated populations of putative *C. bibroni* which based on consistent criteria should be treated as full species in view of both known divergences based on molecular and geological evidence and the accepted Darwinian concept of a species.

In no particular order, they are

- 1/ Nominat form from Fiji (main island/Vita Levu) and the only form with an available name, as in *C. bibroni*.
- 2/ Lau Group of islands, immediately east of Vita Levu in Fiji.
- 3/ Kandavu, immediately south of Vita Levu in Fiji.
- 4/ Loyalty Islands, east of New Caledonia.
- 5/ Vanuatu, and the Banks Islands.
- 6/ Santa Cruz islands, east of the Solomon Islands.
- 7/ Rennell and Bellona, south of the Solomon Islands.
- 8/ San Christobal (AKA Makira) and small islands immediately north in the Solomon Islands.
- 9/ Rotmuma Island.
- 10/ Wallis and Futuna.
- 11/ Samoa.

All are clearly isolated island groups.

Significantly, all were also isolated in the same way as at present during Pleistocene Ice-Age sea level minima, as

ascertained by way of sea depth records and passages between island groups in excess of 120 metres.

This includes those populations identified herein as species from closely proximate locations such as the three from the Fiji Islands (excluding the distant Rotuma) and the three from the eastern Solomon Islands.

Furthermore as seen in the material cited earlier, each and every island group contains endemic species from genera that have crossed the same ocean barriers and yet subsequently speciated in the relevant island groups.

Hence my view that the putative *Candoia bibroni* from each island group should also be treated as full species, rather than subspecies.

Evidence in the literature cited also suggests that the dispersal for *Candoia bibroni sensu lato* across the existing range was rapid and in the order of 2-5 MYA, which again puts each isolated population at the species level.

Examples for each island group's biogeographic isolation in addition to isolation by sea-water barriers are given as follows: 1-3/ The distributions of the three species from Fiji (listed as 1-3 above) effectively mirror in their entirety the co-evolving Iguana species *Brachylophus* in their distributions, as outlined by Keogh *et al.* (2008).

Brachylophus fasciatus (Brongniart, 1800) appears to be endemic to the Lau group of islands.

Robinson (1971) also confirms that the relevant island groups have remained biogeographically separated for a significant period.

The Kadavu fantail *Rhipidura personata* Ramsay, 1876 is a species of bird in the fantail family Rhipiduridae. It is endemic to Kadavu and Ono in the Kadavu Islands, Fiji. On Vita Levu, Fiji it is replaced by the streaked fantail *Rhipidura verreauxi* Marie, 1870. The two similar taxa have speciated in nearby islands due to the same factors isolating the *Candoia*.

4/ Endemism in Pacific genera in the Loyalty Islands is seen in the species *Emoia loyaltiensis* (Roux, 1913), including as referred to by Zug (2012).

5/ There are numerous endemic reptile species from the New Hebrides, including the northern sector. Species include the Toupeed Skink *Emoia sanfordi* Schmidt and Burt (1930), the Vanuatu Coppery Vine Skink *Emoia nigromarginata* (Roux, 1913), the Anatom Tree Skink *Emoia aneityumensis* Medway, 1974, the Eronan Tree Skink *Emoia eronan* Brown, 1991, the Vanuatu Snake-eyed Skink *Cryptoblepharus novohebridicus* Mertens, 1928, the Vanuatu Saw-tailed Gecko *Perochirus guentheri* Boulenger, 1885, the Vanuatu Forest Gecko *Lepidodactylus vanuatuensis* Ota *et al.* 1998 and the Vanuatu Ant-nest Gecko *Lepidodactylus buleli* Ineich, 2008.

Putative *C. bibroni* from the Banks Islands differ from those further south in the New Hebrides and are separated by deep water. But in the absence of a well-defined barrier, they are herein treated as a subspecies of the Vanuatu form.

6-8/ The biogeographical barriers within the Solomon Islands in terms of terrestrial reptiles are well-known. The species *Corucia zebrata* occurs in the San Christobal (AKA Makira) island group, but not in the Santa Cruz islands, east of San Christobal or the Rennell and Bellona islands, south of San Christobal (Hagen *et al.* 2012), meaning each of these populations of putative *C. bibroni* are isolated from one another.

Furthermore the distribution of *Euprepisaurus juxtindicus* (Böhme *et al.*, 2002) is restricted to Rennell and Bellona islands and nowhere else in the Solomon Islands (or anywhere else for that matter), confirming the isolation of terrestrial reptiles here.

9/ Rotuma Island and its physical and biological isolation is confirmed by unique species such as the Rotuma Forest Gecko *Lepidodactylus gardineri* Boulenger, 1897.

10/ Futuna Island and its physical and biological isolation in terms of terrestrial or non-marine vertebrates is confirmed by

unique species such as the freshwater fish *Stiphodon rubromaculatus* Keith and Marquet, 2007, *Akihito futuna* Keith et al., 2008, *Sicyopus sasali* Keith et al., 2011 and *Stenogobius keletaona* Keith and Marquet, 2006.

11/ Samoa and its physical and biological isolation in terms of terrestrial or non-marine vertebrates is confirmed by unique species such as *Emoia samoensis* (Duméril and Duméril, 1851).

GENUS *CANDOIA* GRAY, 1842.

Type species: *Boa carinata* Schneider, 1801.

Diagnosis: All *Candoia* Gray, 1842 are separated from all other Boas and Pythons and physically similar non-venomous constricting snakes with thick, muscular bodies, by the following suite of characters:

Head distinct from the neck, Snout is obliquely truncate. The canthus rostralis is prominent. Body is slightly compressed. All the dorsal scales are strongly keeled. Subcaudals are all single.

There is a pair of longitudinal folds on each branch of hemipenis dividing each branch into a sulcal and an absulcal field; nasal bones overlapping dorsal surface of frontal bones, thus separating prefrontals on the midline.

Distribution: The Pacific Islands from the Samoas in the east to the islands north of New Guinea, including New Guinea and across to Halmahera. Not in Australia, New Caledonia, Tokelau, Tonga or the lower New Hebrides.

CANDOIA BIBRONI (HOMBRON AND JACQUINOT, 1853).

Type locality: Vita Levu, Fiji.

Diagnosis: *Candoia bibroni* and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoseerae* sp. nov. species group, as defined below.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail is more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoseerae sp. nov. and others in the *C. hoseerae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*.

In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoseerae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinet, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni*.

The species *Candoia malcolmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in

common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters: 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai sp. nov.* from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi sp. nov.* from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyreii sp. nov.* from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

As mentioned already, *Candoia hoserae sp. nov.* and others in the *C. hoserae sp. nov.* species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These are *C. hoserae sp. nov.*, *C. louisemgoldrickae sp. nov.*, *C. simonmgoldricki sp. nov.* and *C. jamiekonstandinoui sp. nov.*, the latter of which includes the subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in the *C. bibroni* species group. In the *C. bibroni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae sp. nov.* and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with a pair of lengthwise white dorsolateral stripes from over the quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals and 18-22 maxillary teeth on either side of the mouth.

Candoia louisemgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: Similar in most respects to *C. hoserae sp. nov.* from which it can be separated from by the fact that the upper surface of the head is generally dark in colour, the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae sp. nov.* by being of a generally blotched or broken blotched dorsal pattern.

Candoia simonmgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern

Solomon Islands is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: Similar in most respects to *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.* from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.*). 38-41 midbody scale rows in *C. simonmgoldricki sp. nov.* versus 36-37 in *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.*

The species *Candoia simonmgoldricki sp. nov.* is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.*, 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae sp. nov.* and *Candoia louisemgoldrickae sp. nov.*, 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui sp. nov.* from Vanuatu and the nearby Banks Islands, including nearby islets is separated from all other species within the *C. hoserae sp. nov.* species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow and a uniform yellow beneath. Males are unique in the *C. bibroni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

The subspecies *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae sp. nov.* species group.

Distribution: The *Candoia bibroni* species group is found on the Fiji Islands, Loyalty Islands (but not New Caledonia), Wallis and Futuna, Samoa Islands and Rotuma.

Candoia bibroni is effectively restricted to the main islands of Fiji, including Vita Levu and Ovalau and those immediately north-west.

CANDOIA HOSERAE SP. NOV.

Holotype: A female specimen in the American Museum of Natural History (AMNH), New York, USA, specimen number: AMNH 40407, collected from San Cristobal Island, Solomon Islands.

The American Museum of Natural History (AMNH), New York, USA, allows access to its holdings.

Paratypes: Specimens in the American Museum of Natural History (AMNH), New York, USA, specimen numbers: AMNH 40412, 42092, 42093, 42161, 42165, 42166, 42168, 42198, 42199, 42200, 42201, 42202, 42212, 44502 from San Cristobal Island, Solomon Islands.

Diagnosis: *Candoia hoserae sp. nov.* and others in the *C. hoserae sp. nov.* species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides, which is herein treated as two separate subspecies, separated by deep water.

These taxa are *C. hoserae sp. nov.*, *C. louisemgoldrickae sp. nov.*, *C. simonmgoldricki sp. nov.* and *C. jamiekonstandinoui sp. nov.*, the latter of which includes the subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple

crescent arc as seen in the *C. bibroni* species group. In the *C. bibroni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with pair of lengthwise white dorsolateral stripes from over quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals, 18-22 maxillary teeth on either side of the mouth.

Candoia louisemcgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. from which it can be separated from by the fact that the upper surface of the head is generally dark in colour, the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae* sp. nov. by being of a generally blotched or broken blotched dorsal pattern.

Candoia simonmccgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov. from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov.), 38-41 midbody scale rows in *C. simonmccgoldricki* sp. nov. versus 36-37 in *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov..

The species *Candoia simonmccgoldricki* sp. nov. is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui* sp. nov. from Vanuatu and the nearby Banks Islands, including nearby islets is separated from all other species within the *C. hoserae* sp. nov. species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow; a uniform yellow beneath. Males are unique in the *C. bibroni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui* subsp. nov..

The subspecies *C. jamiekonstandinoui jamiekonstandinoui* subsp. nov. has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui* subsp. nov..

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae* sp. nov. species group.

Candoia bibroni and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined below.

Candoia hoserae sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni*.

The species *Candoia malcolmmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a

distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai sp. nov.* from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi sp. nov.* from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyrei sp. nov.* from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail is more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Distribution: The *Candoia hoserae sp. nov.* species group are found in the Solomon Islands, including San Cristobal (Makira), Rennell, Bellona, Ugi, Olu Malau, Santa Ana, Santa Cruz, Reef Islands, Vanikuro, Utupua as well as the Banks Islands and Vanuatu.

The southern boundary of the species group distribution is the

so-called Cheesman's Line as defined by Hamilton *et al.* (2010), which is a well-known faunal boundary for Pacific island fauna.

Candoia hoserae sp. nov. is restricted to San Cristobal (AKA Makira) and immediately adjacent islets including Ugi Island and Olu Malau.

Etymology: Named in honour of Maxine Hoser of the United Kingdom for services to herpetology, including logistical assistance's for various past projects.

CANDOIA SIMONMCGOLDRICKI SP. NOV.

Holotype: A preserved male specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 40430 collected from Santa Cruz Island, Solomon Islands.

The American Museum of Natural History, New York, USA allows access to its holdings.

Paratypes: 1/ A preserved male specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 42215 collected from Santa Cruz Island, Solomon Islands.

2/ A preserved male specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 42216 collected from Santa Cruz Island, Solomon Islands.

3/ A preserved female specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 42160 collected from Santa Cruz Island, Solomon Islands.

Diagnosis: *Candoia hoserae sp. nov.* and others in the *C. hoserae sp. nov.* species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides, which is herein treated as two separate subspecies, separated by deep water.

These taxa are *C. hoserae sp. nov.*, *C. louisemcgoldrickae sp. nov.*, *C. simonmcgoldricki sp. nov.* and *C. jamiekonstandinou sp. nov.*, the latter of which includes the subspecies *C. jamiekonstandinou georgekonstandinou subsp. nov.*

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in the *C. bibroni* species group. In the *C. bibroni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae sp. nov.* and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with pair of lengthwise white dorsolateral stripes from over quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals, 18-22 maxillary teeth on either side of the mouth.

Candoia louisemcgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: Similar in most respects to *C. hoserae sp. nov.* from which it can be separated from by the fact that the upper surface of the head is generally dark in colour and the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae sp. nov.* by being of a generally blotched or broken

blotched dorsal pattern.

Candoia simonmcgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov. from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov.). 38-41 midbody scale rows in *C. simonmcgoldricki* sp. nov. versus 36-37 in *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov..

The species *Candoia simonmcgoldricki* sp. nov. is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui* sp. nov. from Vanuatu and the nearby Banks Islands, including nearby islets is separated from all other species within the *C. hoserae* sp. nov. species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow; a uniform yellow beneath. Males are unique in the *C. bibrioni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui* subsp. nov..

The subspecies *C. jamiekonstandinoui jamiekonstandinoui* subsp. nov. has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui* subsp. nov..

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae* sp. nov. species group.

Candoia bibrioni and other species described in this paper that were formerly treated as populations of *C. bibrioni* are herein defined as being the *C. bibrioni* species complex.

The *C. bibrioni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined elsewhere in this paper.

Distribution: The *Candoia hoserae* sp. nov. species group are found in the Solomon Islands, including San Cristobal (Makira), Rennell, Bellona, Ugi, Olu Malau, Santa Ana, Santa Cruz, Reef Islands, Vanikuro, Utupua as well as the Banks Islands and Vanuatu.

The southern boundary of the species distribution is the so-called Cheesman's Line as defined by Hamilton *et al.* (2010), which is a well-known faunal boundary for Pacific island fauna.

C. simonmcgoldricki sp. nov. is restricted to the Santa Cruz islands and nearby islands including the Reef Islands, Santa Ana, Vanikuro, Utupua and immediately adjacent islets.

Etymology: *C. simonmcgoldricki* sp. nov. is named in honour of Simon McGoldrick of Ringwood East, Melbourne, Victoria, Australia, for his contributions to wildlife conservation and education including through his work with Snakebusters: Australia's best reptiles shows.

CANDOIA LOUISEMCGOLDRICKAE SP. NOV.

Holotype: A specimen at the Field Museum of Natural History (FMNH), Chicago, Illinois, USA, specimen number: 71741 (FMNH Amphibians and Reptiles) from Bellona Island, Solomon Islands.

This facility allows access to its holdings by scientists.

Paratype: A specimen at the Field Museum of Natural History (FMNH), Chicago, Illinois, USA, specimen number: 71742

(FMNH Amphibians and Reptiles) from Bellona Island, Solomon Islands.

Diagnosis: *Candoia hoserae* sp. nov. and others in the *C. hoserae* sp. nov. species group including *C. louisemcgoldrickae* sp. nov. are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the proximal Banks Islands and nearby New Hebrides, which is herein treated as two separate subspecies, being separated by deep water.

These taxa are *C. hoserae* sp. nov., *C. louisemcgoldrickae* sp. nov., *C. simonmcgoldricki* sp. nov. and *C. jamiekonstandinoui* sp. nov., the latter of which includes the subspecies *C. jamiekonstandinoui georgekonstandinoui* subsp. nov..

These species are all separated from *C. bibrioni* and others in the *C. bibrioni* species group (being all others in the *C. bibrioni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in the *C. bibrioni* species group. In the *C. bibrioni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with pair of lengthwise white dorsolateral stripes from over quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals, 18-22 maxillary teeth on either side of the mouth.

Candoia louisemcgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. from which it can be separated from by the fact that the upper surface of the head is generally dark in colour, the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae* sp. nov. by being of a generally blotched or broken blotched dorsal pattern.

Candoia simonmcgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov. from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov.). 38-41 midbody scale rows in *C. simonmcgoldricki* sp. nov. versus 36-37 in *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov..

The species *Candoia simonmcgoldricki* sp. nov. is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui* sp. nov. from Vanuatu and the nearby Banks Islands, including nearby islets is

separated from all other species within the *C. hoserae* sp. nov. species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow; a uniform yellow beneath. Males are unique in the *C. bibrioni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

The subspecies *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae* sp. nov. species group.

Candoia bibrioni and other species described in this paper that were formerly treated as populations of *C. bibrioni* are herein defined as being the *C. bibrioni* species complex.

The *C. bibrioni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined elsewhere in this paper.

Distribution: *C. louisemcgoldrickae* sp. nov. is restricted to Rennell and Bellona and immediately adjacent islets in the south-east Solomon Islands.

The *Candoia hoserae* sp. nov. species group are found in the Solomon Islands, including San Cristobal (Makira), Rennell, Bellona, Ugi, Olu Malau, Santa Ana, Santa Cruz, Reef Islands, Vanikuro, Utupua as well as the Banks Islands and Vanuatu.

The southern boundary of the species distribution is the so-called Cheesman's Line as defined by Hamilton *et al.* (2010), which is a well-known faunal boundary for Pacific island fauna.

Etymology: *C. louisemcgoldrickae* sp. nov. is named in honour of Louise McGoldrick of Ringwood East, Melbourne, Victoria, Australia, for her contributions to wildlife conservation and education including through her work with Snakebusters: Australia's best reptiles shows over many years.

CANDOIA JAMIEKONSTANDINOUI SP. NOV.

Holotype: A female specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: 42004 collected at Malekula Island (Vanuatu), New Hebrides.

This is a facility that allows access to its holdings by scientists.

Paratypes: 1/ A female specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: 81584 collected at Malekula Island (Vanuatu), New Hebrides.

2/ A female specimen at the American Museum of Natural History (AMNH), New York, USA specimen number: 81583 collected at Espiritu Santo (Vanuatu), New Hebrides.

3/ A male specimen at the American Museum of Natural History (AMNH), New York, USA specimen number: 42075 collected at Espiritu Santo (Vanuatu), New Hebrides.

Diagnosis: *Candoia hoserae* sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides, which is herein treated as two separate subspecies, separated by deep water.

These taxa are *C. hoserae* sp. nov., *C. louisemcgoldrickae* sp. nov., *C. simonmcgoldricki* sp. nov. and *C. jamiekonstandinoui* sp. nov., the latter of which includes the subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

These species are all separated from *C. bibrioni* and others in the *C. bibrioni* species group (being all others in the *C. bibrioni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in the *C. bibrioni* species group. In the *C. bibrioni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra

between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with pair of lengthwise white dorsolateral stripes from over quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals, 18-22 maxillary teeth on either side of the mouth.

Candoia louisemcgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. from which it can be separated from by the fact that the upper surface of the head is generally dark in colour and the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae* sp. nov. by being of a generally blotched or broken blotched dorsal pattern.

Candoia simonmcgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern Solomon Islands is separated from all other species within the *C. hoserae* sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov. from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae* sp. nov. and *C. louisemcgoldrickae* sp. nov.). 38-41 midbody scale rows in *C. simonmcgoldricki* sp. nov. versus 36-37 in *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov.

The species *Candoia simonmcgoldricki* sp. nov. is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae* sp. nov. and *Candoia louisemcgoldrickae* sp. nov., 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui* sp. nov. from Vanuatu and the nearby Banks Islands, including nearby islets is separated from all other species within the *C. hoserae* sp. nov. species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow; a uniform yellow beneath. Males are unique in the *C. bibrioni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

The subspecies *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae* sp. nov. species group.

Candoia bibrioni and other species described in this paper that were formerly treated as populations of *C. bibrioni* are herein defined as being the *C. bibrioni* species complex.

The *C. bibrioni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined elsewhere in this paper.

Distribution: The nominate form of *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* is found on the New Hebrides islands of Malekula, Espiritu Santo, Ambae (AKA Aoba), Malo and Maewo. The subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.* is found on the Banks Islands including Vanua Lava and presumably other major islands in the group.

Etymology: Named in honour of Jamie Christopher Konstandinoui of George's Park Orchards Service Centre in Ringwood, Victoria, Australia formerly of Park Orchards, Victoria, Australia, for vital logistical support to important herpetological scientific research projects for more than a decade.

CANDOIA JAMIEKONSTANDINOUI GEORGEKONSTANDINOUI SUBSP. NOV.

Holotype: A male specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: 81581 collected at Vanua Lava (Banks Islands), New Hebrides.

This is a facility that allows access to its holdings by scientists.

Paratype: A male specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: 81582 collected at Vanua Lava (Banks Islands), New Hebrides.

Diagnosis: *Candoia hoserae sp. nov.* and others in the *C. hoserae sp. nov.* species group are defined herein as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby northern and central New Hebrides, which is herein treated as two separate subspecies, separated by deep water.

These taxa are *C. hoserae sp. nov.*, *C. louisemgoldrickae sp. nov.*, *C. simonmcgoldricki sp. nov.* and *C. jamiekonstandinoui sp. nov.*, the latter of which includes the subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

These species are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) as detailed in the preceding text, by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in the *C. bibroni* species group. In the *C. bibroni* species group the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae sp. nov.* and others in that species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla (derived from McDowell, 1979).

Candoia hoserae sp. nov. from the island of San Cristobal (AKA Makira) and nearby islets is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: A striped dorsal body pattern, being light brown with pair of lengthwise white dorsolateral stripes from over quadrate bone to near the tail-tip, the stripes edged with brown and a brown streak from angle of mouth almost to eye; the belly is buffy white; 235-257 ventrals, 18-22 maxillary teeth on either side of the mouth.

Candoia louisemgoldrickae sp. nov. from the islands of Rennell and Bellona in the Solomon Islands is separated from all other species within the *C. hoserae sp. nov.* species complex by the following unique suite of characters: Similar in most respects to *C. hoserae sp. nov.* from which it can be separated from by the fact that the upper surface of the head is generally dark in colour and the generally dark head and the prominent thin, light temporal streak that runs to the neck is bounded by a distinctive white border at the margins. This taxon is also separated from *C. hoserae sp. nov.* by being of a generally blotched or broken blotched dorsal pattern.

Candoia simonmcgoldricki sp. nov. from the Santa Cruz island group, including the nearby Reef Islands within the eastern Solomon Islands is separated from all other species within the

C. hoserae sp. nov. species complex by the following unique suite of characters: Similar in most respects to *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.* from which it can be separated from it by a profusion of black pigment on the dorsal snout tip and including the rostral and all of first labial on either side. There is a particularly thick dark postorbital stripe (as opposed to medium in *C. hoserae sp. nov.* and *C. louisemgoldrickae sp. nov.*). 38-41 midbody scale rows in *C. simonmcgoldricki sp. nov.* versus 36-37 in *C. hoserae sp. nov.* and *Candoia louisemgoldrickae sp. nov.*

The species *Candoia simonmcgoldricki sp. nov.* is further diagnosed and defined by the following: 15-21 infralabials, 250-266 ventrals versus 235-257 for *C. hoserae sp. nov.* and *Candoia louisemgoldrickae sp. nov.*, 61-64 subcaudals versus 54-63 subcaudals for *C. hoserae sp. nov.* and *Candoia louisemgoldrickae sp. nov.*, 18-22 maxillary teeth, hemipenis fully everted extending from 9-20 subcaudals.

The species *Candoia jamiekonstandinoui sp. nov.* from Vanuatu and the nearby Banks Islands, including nearby islets is separated from all other species within the *C. hoserae sp. nov.* species group by the following unique suite of characters: A distinctive dorsal colouration of pale reddish brown above with semidistinct markings, with a dark brown vertebral stripe edged with yellow; a uniform yellow beneath. Males are unique in the *C. bibroni* species complex in that they have some noticeable dark pigmentation on the hemipenes. 16-18 maxillary teeth for the nominate subspecies, versus 19 in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

The subspecies *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* has 234-247 ventrals, versus 222-225 ventrals in *C. jamiekonstandinoui georgekonstandinoui subsp. nov.*

C. jamiekonstandinoui georgekonstandinoui subsp. nov. has the lowest ventral counts of any named taxon within the *C. hoserae sp. nov.* species group.

Candoia bibroni and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserae sp. nov.* species group, as defined elsewhere in this paper.

Distribution: The nominate form of *C. jamiekonstandinoui jamiekonstandinoui subsp. nov.* is found on the New Hebrides islands of Malekula, Espiritu Santo, Ambae (AKA Aoba), Malo and Maewo. The subspecies *C. jamiekonstandinoui georgekonstandinoui subsp. nov.* as defined herein is found on the Banks Islands including Vanua Lava and presumably other major islands in the group.

Etymology: This Subspecies is named in honour of George Konstandinoui of George's Park Orchards Service Centre in Ringwood, Victoria, Australia formerly of Park Orchards, Victoria, Australia, for vital logistical support to significant herpetological scientific research projects and Snakebusters wildlife conservation displays for more than a decade.

CANDOIA WOOLFI SP. NOV.

Holotype: A male specimen at the Museum of Comparative Zoology, Harvard University, USA, specimen number MCZ Herp R-15020, from Lakeba (AKA Lakemba) Island in the Lau group of islands, Fiji Islands.

The Museum of Comparative Zoology, Harvard University, USA, is a facility that allows access to its holdings by scientists.

Paratypes: Two female specimens at the Museum of Comparative Zoology, Harvard University, USA, specimen numbers MCZ Herp R-15019 and MCZ Herp R-15021, from Lakeba (AKA Lakemba) Island in the Lau group of islands, Fiji Islands.

Diagnosis: *Candoia bibroni* and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined below or elsewhere in this paper.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoserae sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinet, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following

suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni*.

The species *Candoia malcolmmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyrei* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Distribution: *C. woolfi* sp. nov. is found in the Lau Group of islands, east of the main Fiji islands, in a region generally south of the deep water Nanuku Passage and east of the Koro Sea. The taxon is found on most of the larger islands in the group including Vanua Mbelavu, Lakemba, Ongea Levu and Fulanga.

Etymology: Named in honour of Paul Woolf, of Walloon, Queensland, Australia in recognition of contributions to herpetology spanning three decades, including in his role as foundation president of the Herpetological Society of Queensland Incorporated, HSQI, and management roles in the society ever since, as well his defence of herpetology from illegal acts of taxonomic vandalism by the likes of convicted criminal David John Williams and associates in crime, Wolfgang Wüster, Mark O'Shea, Wulf Schleip, Scott Thomson, Van Wallach, George Zug, Anders Rhodin and Hinrich Kaiser.

CANDOIA KIMMOOREAE SP. NOV.

Holotype: A preserved specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.135213 collected at Nakasaleka in the north of Kadavu Island, Fiji (18°57'S, 178°23'E).

This is a government owned facility that allows access to its holdings.

Paratypes: Two preserved specimens at the Australian Museum, Sydney, NSW, Australia, specimen numbers: R.135212 and R.135214 collected at Nakasaleka in the north of Kadavu Island, Fiji (18°57'S, 178°23'E).

Diagnosis: *Candoia bibrioni* and other species described in this paper that were formerly treated as populations of *C. bibrioni* are herein defined as being the *C. bibrioni* species complex.

The *C. bibrioni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined below.

All species within the *C. bibrioni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibrioni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibrioni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; supralabials excluded from the eye; canthus rostralis angular.

Candoia hoserae sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibrioni* and others in the *C. bibrioni* species group (being all others in the *C. bibrioni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibrioni*. In *C. bibrioni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes

sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibrioni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibrioni* is separated from all other species within the *C. bibrioni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibrioni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibrioni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibrioni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibrioni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibrioni* as described herein.

The species *Candoia malcolmmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibrioni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibrioni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibrioni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibrioni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibrioni* complex by the following suite of

characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyreii* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Distribution: The islands of Kadavu and Ono in southern Fiji, in a region generally bounded by the deep water Kadavu Passage in the north and the Great Astrolabe Reef to the east.

Etymology: Named in honour of Kim Moore of Brisbane, Queensland, Australia, widow of Michael Moore (Pike), for her services to herpetology, including in association with the Herpetological Society of Queensland Incorporated, over some decades.

CANDOIA MALCOLMCLUREI SP. NOV.

Holotype: A preserved female specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 60468 from Mare Island in the Loyalty Islands, (territory of New Caledonia).

This is a facility that allows access to its holdings.

Paratypes: Two preserved female specimens at the American Museum of Natural History, New York, USA, specimen numbers: AMNH 61681 and AMNH 61682 from Ouvea Island in the Loyalty Islands, (territory of New Caledonia), as well as a male, specimen number: AMNH 61711 from the same place.

Diagnosis: *Candoia bibroni* and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserai* sp. nov. species group, as defined below.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-

22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoserai sp. nov. and others in the *C. hoserai* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserai* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni* as described herein.

The species *Candoia malcolmclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a

distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyreii* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Distribution: *C. malcolmmclurei* sp. nov. is known only from the Loyalty Islands of Ouvea, Lifou and Mare.

Etymology: Named in honour of Malcolm McLure of near Yea, Victoria, Australia, formerly of Elwood, Victoria, Australia, in recognition of his many public interest contributions to Australia, including his battles against illegally imposed road tolls in Australia, via his organisation UPMART, political corruption in Australia, including by exposing tax-evading corporations avoiding prosecution as a result of corrupt and illegal cash donations to politicians.

CANDOIA BOUTROSI SP. NOV.

Holotype: A preserved male specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 41742 collected on the island of Savaii, Western Samoa. This is a facility that allows access to its holdings.

Paratype: A preserved female specimen at the American Museum of Natural History, New York, USA, specimen number: AMNH 41743 collected at the island of Savaii, Western Samoa.

Diagnosis: *Candoia bibroni* and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserai* sp. nov. species group, as defined below.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being

capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoserai sp. nov. and others in the *C. hoserai* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserai* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni* as described herein.

The species *Candoia malcolmmclurei* sp. nov. from the Loyalty

Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyreii* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Distribution: *C. boutrosi* sp. nov. is known only from the islands of Samoa.

Etymology: Named in honour of Steve Boutros, from Templestowe, Victoria, Australia in recognition of his many contributions to the administration of justice via the legal system in Australia and other public benefit activities.

CANDOIA NIRAIKANUKIWAI SP. NOV.

Holotype: A preserved adult specimen at the French National Museum of Natural History, known in French as the Muséum national d'histoire naturelle, in Paris, France, specimen number: MNHN 1986.690, collected at Point Vele, Futuna, within the territory of Wallis and Futuna.

This is a facility that allows access to its holdings.

Paratype: A preserved specimen at the French National Museum of Natural History, known in French as the Muséum national d'histoire naturelle, in Paris, France, specimen number: MNHN RA 1993.228, collected on the island of Alafi, within the territory of Wallis and Futuna.

Diagnosis: *Candoia bibroni* and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined below.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoserae sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or entirely filled in by expansion of the premaxilla.

Candoia bibroni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibroni* is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibroni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of

islands, east of the main Fiji islands is separated from all other species within the *C. bibroni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibroni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibroni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibroni* as described herein.

The species *Candoia malcolmmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibroni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibroni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibroni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibroni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

The species *Candoia georgemacintyreii* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Distribution: *Candoia niraikanukiwai* sp. nov. is known only from the islands of Wallis and Futuna.

Etymology: Named in honour of Nirai Karatia Kanukiwa of

George's Park Orchards Service Centre in Ringwood, Victoria, Australia formerly of Park Orchards, Victoria, Australia, for vital logistical support to significant herpetological scientific research projects and Snakebusters wildlife conservation displays for the best part of a decade. It is also fitting that a man of Pacific Island descent should have a Pacific Island species named in his honour. The days of a gross over-representation of Eurocentric patronyms in Zoology should have ended long ago!

CANDOIA GEORGEMACINTYREI SP. NOV.

Holotype: A preserved specimen at the Natural History Museum, London, UK, specimen number: 1897.7.29.13 collected at the island of Rotuma, (territory controlled by Fiji). This is a facility that allows access to its holdings.

Diagnosis: The species *Candoia georgemacintyreii* sp. nov. from the island of Rotuma, is separated from all other species within the *C. bibroni* species complex by the following unique suite of characters: 235-240 ventrals, 57-63 subcaudals, 37-39 mid body rows and significant lightening of the upper labials; the dorsal pattern is blotched and semi-distinct and there is significant speckling and markings on the venter.

Candoia bibroni and other species described in this paper that were formerly treated as populations of *C. bibroni* are herein defined as being the *C. bibroni* species complex.

The *C. bibroni* species group are those species not included in the *C. hoserae* sp. nov. species group, as defined below.

All species within the *C. bibroni* species complex are separated from all other *Candoia* by having supralabials separated from the eye by the subocular scales, versus *C. carinata* (Schneider, 1801) and *C. paulsoni* (Stull, 1956) which have them entering the eye; preocular differentiated; canthus rostralis rounded; a relatively slender body with lengthwise ridges on the body scales that run parallel to the long axis of the body, versus a stout body with keels on the body scales forming oblique rows as in *C. aspera* (Günther, 1877); ventrals 203-266; subcaudals 44-67. Furthermore the tail more than twice as long as the head, being capable of more than one complete circle of coiling in the vertical plane.

The species *Candoia carinata* (Schneider, 1801) including species and subspecies formerly treated as being within this taxon (e.g. *C. paulsoni* Stull, 1956) is separated from the *C. bibroni* complex by having 2, or rarely 1 or 3 supralabials entering eye; an angulate canthus rostralis, 160-202 ventrals and 35-60 subcaudals.

The species *Candoia aspera* (Günther, 1877) including species and subspecies formerly treated as being within this taxon is separated from the *C. bibroni* complex by having a tail less than twice as long as the head, usually being shorter than the head; is incapable of forming a full circle of coiling in vertical plane; at least on the anterior two-thirds of body are keels of scales forming curved diagonal ridges along the sides, which extend backward and downward towards the belly; 127-153 ventrals; 11-22 subcaudals; no specially enlarged preocular; (supralabials excluded from the eye; canthus rostralis angular).

Candoia hoserae sp. nov. and others in the *C. hoserae* sp. nov. species group are defined as the three species from the Solomon Islands, including outliers, as well as the single species from the Banks Islands and nearby New Hebrides.

These species which are defined in detail already in this paper, are all separated from *C. bibroni* and others in the *C. bibroni* species group (being all others in the *C. bibroni* complex) by the form of the postorbital bone, which has its ventral (free) end abruptly flexed backward, as in *C. carinata*, rather than forming a simple crescent arc as seen in *C. bibroni*. In *C. bibroni* the premaxilla has the "typical boine" form described by Frazzetta (1959, 1975), with a large fenestra between the narial vestibules, this fenestra bounded anteriorly by the premaxilla and posteriorly by the nasals; but *C. hoserae* sp. nov. and others in the species group are like *C. carinata* (with which they are sometimes sympatric) in having the intervestibular fenestra largely or

entirely filled in by expansion of the premaxilla.

Candoia bibrioni (Hombron and Jacquinot, 1853) *sensu stricto* as defined in this paper, is the taxon from the main Fiji islands including Viti Levu and Vanua Levu and immediately adjacent islands, but not including Kadavu or the islands in the Lau group, each of which has a different species.

The taxon *C. bibrioni* is separated from all other species within the *C. bibrioni* species complex by the following suite of characters: A blotched dorsal pattern with distinctive throat stripes and a low ventral count ranging from 207-227 ventrals.

The species *C. bibrioni* is further defined by the following suite of characters: 18-22 Maxillary teeth, (versus 17-19 in *C. woolfi* sp. nov. from the Lau Group of islands), 53-59 subcaudals (versus 45-56 in *C. woolfi* sp. nov. from the Lau Group of islands), 10-16 supralabials, 12-17 infralabials, 26-30 scale rows behind the head at one head length behind the head (versus 33-34 in *C. woolfi* sp. nov.), 30-37 midbody rows, 19-24 scale rows one headlength anterior to the cloaca, hemipenis forks at subcaudal 6-10.

The species *Candoia woolfi* sp. nov. from the Lau Group of islands, east of the main Fiji islands is separated from all other species within the *C. bibrioni* species complex by the following suite of characters: A blotched pattern without stripes. The tail pattern is much more conspicuous than that of body, the pale bordering of body blotches also replacing darker ground color on the tail; 205-236 ventrals; there are 33-34 scale rows behind the head at one head length behind the head (versus 26-30 in *C. bibrioni*).

The species *Candoia kimmooreae* sp. nov. from the island of Kadavu, southern Fiji is separated from all other species within the *C. bibrioni* species complex by having a blotched pattern which includes a prominent median throat stripe and no lateral throat stripes. Otherwise this taxon is essentially similar in form to nominate *C. bibrioni* as described herein.

The species *Candoia malcolmaclurei* sp. nov. from the Loyalty Islands, (territory controlled by New Caledonia) is separated from all other species within the *C. bibrioni* species complex by having a blotched pattern without stripes and a tail similar in pattern to the body, or alternatively a blotched pattern with throat stripes including a median row of dark spots on anterior ventrals; dark perocular streak from angle of mouth (or angle of jaw) through eye to loreal region, dark spots on lips, and dark spotting on top of head and with a median ventral row of dark spots. Sometimes the colouration is dulled to appear unicolour. The species is further defined by having 13-16 infralabials, 27-30 scale rows on the neck at one head length back, 20-22 scale rows at one headlength anterior to the cloaca, 219-226 ventrals, 53-60 subcaudals and 19-22 maxillary teeth on either side.

The species *Candoia boutrosi* sp. nov. from the islands of Samoa is separated from all other species within the *C. bibrioni* species complex by the following unique suite of characters: a distinctive blotched dorsal body pattern that is one or other of being distinct or very indistinct, the large dark blotches being the main component of the dorsal midline for the anterior and mid-body, with the lighter blotches dominating the midline posteriorly, reversing on the tail to have the darker blotches dominate on the tail, which remains brightly marked for the whole length. The dorsal colouration is a combination of chocolate brown and beige in distinctly marked animals or a hybrid of this in the indistinctly marked animals. On the head is a well-defined creamish bar on the upper labials above the jawline.

It is also defined as having 12 supralabials bilaterally (in common with the three species from the Fiji Islands), 15-16 infralabials (as for *C. bibrioni sensu stricto*), and 31-32 scale rows on the neck, one head length back from the head (versus 26-30 in *C. bibrioni sensu stricto*).

C. boutrosi sp. nov. is further defined and separated from the other species in the *C. bibrioni* complex by the following suite of characters 37-38 mid-body rows, 22-24 scale rows at one head

length anterior to the cloaca, 237-252 ventrals, 51-61 subcaudals and 16-18 maxillary teeth on either side.

The species *Candoia niraikanukiwai* sp. nov. from the islands of Wallis and Futuna, including nearby islets is separated from all other species within the *C. bibrioni* species complex by the following unique suite of characters: It is essentially similar in most respects to *C. boutrosi* sp. nov. from which it differs by having a distinctive well-defined stripe running through the eye on either side of the head and the absence of a well-defined creamish bar on the upper labials above the jawline.

Distribution: *Candoia georgemacintyre* sp. nov. is restricted to the island of Rotuma, controlled politically by Fiji.

Etymology: Named in honour of George Hayden McIntyre of George's Park Orchards Service Centre in Ringwood, Victoria, Australia formerly of Park Orchards, Victoria, Australia, for vital logistical support to significant herpetological scientific research projects and Snakebusters wildlife conservation displays for the best part of a decade.

NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISORS

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or more newly named taxa be merged by later authors to be treated as a single species, the order of priority of retention of names should be the order (page priority) of the formal descriptions within this text.

REFERENCES CITED

- Adler, G. H., Austin, C. C. and Dudley, R. 1995. Dispersal and speciation of skinks among archipelagos in the tropical Pacific Ocean. *Evolutionary Ecology* 9:529-541.
- Austin, C. C. 2000. Molecular phylogeny and historical biogeography of Pacific Island boas (*Candoia*). *Copeia* 2000(2):341-352.
- Austin, C. C., Rittmeyer, E. N., Richards, S. J. and Zug, G. R. 2010. Phylogeny, historical biogeography and body size evolution in Pacific Island Crocodile skinks *Tribolonotus* (Squamata; Scincidae). *Molecular Phylogenetics and Evolution* 57(1):227-236.
- Balsai, M. J. 1995. Husbandry and Breeding of the Solomon Islands Prehensile-tailed Skink, *Corucia zebrata*. *The Vivarium* 7(1):4-11.
- Barbour, T. 1921. Reptiles and amphibians from the British Solomon Islands. *Proc. New England zool. Club* 7:91-112.
- Bauer, A. M. 1999. The terrestrial reptiles of New Caledonia: The origin and evolution of a highly endemic herpetofauna. in: Ota, H. (ed.) *Tropical Island Herpetofauna: Origin, Current Diversity, and Conservation*. Elsevier, pp:3-25.
- Bauer, A. M. and Sadler, R. A. (eds.) 2000. *The herpetofauna of New Caledonia*. Contributions to Herpetology, 17; Society for Study Amphibians and Reptiles (SSAR), Ithaca, New York.
- Bauer, A. M. and Vindum, J. V. 1990. A checklist and key to the herpetofauna of New Caledonia, with remarks on biogeography. *Proc. Cal. Acad. Sci.* 47(2):17-45.
- Böhme, W., Philipp, K. and Ziegler, T. 2002. Another new member of the *Varanus* (*Euprepiosaurus*) *indicus* group (Sauria: Varanidae): an undescribed species from Rennell Island, Solomon Islands. *Salamandra* 38(1):15-26.
- Boulenger, G. A. 1884. Diagnoses of new reptiles and batrachians from the Solomon Islands, collected and presented to the British Museum by H. B. Guppy, Esq., M. B., H. M. S. 'Lark.'. *Proc. Zool. Soc. London* 1884:210-213.
- Boulenger, G. A. 1885. *Catalogue of the Lizards in the British Museum (Nat. Hist.) I. Geckonidae, Eublepharidae, Uroplatae, Pygopodidae, Agamidae*. London:450 pp.
- Boulenger, G. A. 1886. On the reptiles and batrachians of the Solomon Islands. *Trans. Zool. Soc. London* 12:35-62.

- Boulenger, G. A. 1890. Fourth contribution to the herpetology of the Solomon Islands. *Proc. Zool. Soc. London* 1890:30-31.
- Boulenger, G. A. 1893. *Catalogue of the snakes in the British Museum (Nat. Hist.) I*. London (Taylor and Francis):448 pp.
- Boulenger, G. A. 1897. On the reptiles of Rotuma Island, Polynesia. *Ann. Mag. Nat. Hist.* (6)20:306-307.
- Boulenger, G. A. 1898. Description of a new death adder (*Acanthophis*) from central Australia. *Ann. Mag. nat. Hist.* (7)2:75.
- Brongniart, A. 1800. Essai d'une classification naturelle des reptiles. *Bull. Soc. Philomath.* 2(36):89-91.
- Brown, W. C. 1991. Lizards of the genus *Emoia* (Scincidae) with observations on their evolution and biogeography. *Memoirs of the California Academy of Sciences* 15: i-vi,1-94.
- Bruns, T. R., Vedder, J. R. and Cooper, A. K. 1989. Geology of the Shortland Basin Region, Central Solomons Trough, Solomon Islands - Review and New Findings. pp. 125-144 in Vedder, J.G., and Bruns, T. R., (editors), 1989. Geology and offshore resources of Pacific island arcs Solomon Islands and Bougainville, Papua New Guinea Regions: Houston, Texas, Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series, v. 12.
- Cogger, H. G. 1972. A new scincid lizard of the genus *Tribolonotus* from Manus Island, New Guinea. *Zool. Mededelingen* 47:202-210.
- Colvée, S. and Weffer, E. 2004. *Candoia aspera* - The Short-Tailed Ground Boa. *Reptilia* (GB) (33):43-49.
- Colvée, S. and Martín, A. 2005. Keeping Pacific Island Boas of the Genus *Candoia*. *Reptilia* (GB)(39):73-77.
- Court of Appeal Victoria 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 September 2014).
- Dahl, A. L. 1986. *Review of the protected areas system in Oceania*. IUCN/UNEP, Gland, Switzerland.
- Daza, J. D., Bauer, A. M., Sand, C., Lilley, I., Wake, T. A. and Valentin, F. 2015. Reptile Remains from Tiga (Tokanod), Loyalty Islands, New Caledonia. *Pacific Science* Oct 2015, 69(4):531-557.
- de Rooij, N. 1917. *The Reptiles of the Indo-Australian Archipelago. II. Ophidia*. Leiden (E. J. Brill), xiv+334 S.
- D'Hondt, S., Pocklany, R., Spivack, A. and Smith, D. 2009. Subseafloor Sediment In South Pacific Gyre One Of Least Inhabited Places On Earth. *Proceedings of the National Academy of Sciences of the United States of America*. 11651(6).
- Duméril, A. M. C. and Bibron, G. 1839. *Erpétologie Générale on Histoire Naturelle Complète des Reptiles*. Vol.5. Roret/Fain et Thunot, Paris:871 pp.
- Duméril, A. M. C. and Bibron, G. 1844. *Erpétologie Générale ou Histoire Naturelle Complete des Reptiles*. Vol.6. Libr. Encyclopédique Roret, Paris, 609 pp.
- Duméril, A. M. C. and Duméril, A. H. A. 1851. *Catalogue méthodique de la collection des reptiles du Muséum d'Histoire Naturelle de Paris*. Gide et Baudry/Roret, Paris:224 pp.
- Forcart, L. 1951. Nomenclature Remarks on Some Generic Names of the Snake Family Boidae. *Herpetologica* 7:197-199.
- Frazzetta, T. H. 1959. Studies on the morphology and function of the skull in the Boidae (Serpentes). Part I. Cranial differences between *Python sebae* and *Epicrates cenchrus*. *Bull. Mus. comp. Zool. Harvard*, 119:453-472.
- Frazzetta, T. H. 1975. Pattern and instability in the evolving premaxilla of boine snakes. *Amer. Zool.*, 15:469-481.
- Garman, S. 1901. Some reptiles and batrachians from Australasia. *Bull. Mus. Comp. Zool. Harvard* 39:1-14.
- Gill, B. J. 1993. The Land Reptiles of Western Samoa. *Journal of the Royal Society Of New Zealand* 23(2):79-89.
- Gill, B. J. 1995. Notes on the land reptiles of Wallis and Futuna, South-west Pacific. *Records of the Auckland Institute and Museum*, 32:55-61.
- Gray, J. E. 1856. New genus of fish-scaled lizards (Scissosarae) from New Guinea. *Ann. Mag. Nat. Hist.* (2)18:345-346.
- Greer, A. E. 1982. A new species of *Geomyersia* (Scincidae) from the Admiralty Islands, with a summary of the genus. *Journal of Herpetology* 16(1):61-66.
- Greer, A. E. and Parker, F. 1967. A new scincid lizard from the northern Solomon Islands. *Breviora* (275):1-20.
- Greer, A. E. and Simon, M. 1982. *Fojia bumui*, an unusual new genus and species of scincid lizard from New Guinea. *Journal of Herpetology* 16(2):131-139.
- Günther, A. 1877. On a collection of reptiles and fishes from Duke of York Island, New Ireland, and New Britain. *Proc. zool. Soc. London* 1877:127-132.
- Hagen, I. J., Donnellan, S. C. and Bull, M. 2012. Phylogeography of the prehensile-tailed skink *Corucia zebrata* on the Solomon Archipelago. *Ecology and Evolution* (2012), 2(6):1220-1234.
- Hall, R., 2002. Cenozoic geological and plate tectonic evolution of SE Asia and the SW Pacific: computer-based reconstructions, model and animations. *J. Asian Earth Sci.* 20:353-431.
- Hamilton, A. M., Klein, E. R. and Austin, C. C. 2010. Biogeographic Breaks in Vanuatu, a Nascent Oceanic Archipelago. *Pacific Science* 64(2):149-159.
- Harvey, M. B., Barker, D. G., Ammerman, L. K. and Chippendale, P. T. 2000. Systematics of pythons of the *Morelia amethystina* complex (Serpentes: Boidae) with the description of three new species. *Herpetological Monographs* (The Herpetologists League Incorporated) 14:139-185.
- Higgins, H. 1943. A Few Reptiles from Western Samoa. *Copeia* 1943(1):59.
- Hoser, R. T. 1995. The Australian Broad-headed Snake *Hoplocephalus bungaroides*. *The Reptilian Magazine* (UK), 3(10):15-27 and cover.
- Hoser, R. T. 1998. Death Adders (Genus *Acanthophis*): An overview, including descriptions of five new species and one subspecies. *Monitor - Journal of the Victorian Herpetological Society Inc.* 9(2):20-41.
- Hoser, R. T. 2013. Tidying up the taxonomy of the extant Booidea, including the erection and naming of two new families, the description of *Acrantophis sloppi* sp. nov., a new species of Ground Boa from Madagascar and *Candoia aspera iansimpsoni*, subsp. nov., a new subspecies of Boa from Papua New Guinea. *Australasian Journal of Herpetology* 16:3-8.
- Hoser, R. T. 2014. Tidying up Death Adder taxonomy (Serpentes: Elapidae: *Acanthophis*): including descriptions of new subspecies and the first ever key to identify all recognized species and subspecies within the genus. *Australasian Journal of Herpetology* 23:22-34.
- Ineich, I. 2008. A new arboreal *Lepidodactylus* (Reptilia: Gekkonidae) from Espiritu Santo Island, Vanuatu: from egg to holotype. *Zootaxa* 1918:26-38.
- Ineich, I. 2009. The terrestrial herpetofauna of Torres and Banks Groups (northern Vanuatu), with report of a new species for Vanuatu. *Zootaxa* 2198:1-15.
- Ineich, I. 2011. Amphibians and reptiles. In: Bouchet P., Le Guyader, H. and Pascal, O. (eds), *The Natural History of Santo*. pp. 187-236. MNHN, Paris; Ird, Marseille; PNI, Paris:572 pp. (Patrimoines naturels; 70).
- Iskandar, D. T. and Erdelen, W. R. 2006. Conservation of amphibians and reptiles in Indonesia: issues and problems. *Amphibian and Reptile Conservation* 4(1):60-87.
- Jacquinet, H. and Guichenot, A. 1853. Reptiles et poissons. In: Hombron and Jacquinet, *Zoologie* 3, in: *Dumont d'Urville, Voyage au Pole Sud et dans l'Oranie sur les corvettes*

- "l'Astrolabe" et "la Zélée", ... Gide and J. Baudry, Paris:56 pp.
- Keith, P. and Marquet, G. 2006. *Stenogobius (Insularigobius) keletaona*, a new species of freshwater goby from Futuna Island (Teleostei: Gobiidae). *Cybiurn* 30(2):139-143.
- Keith, P. and Marquet, G. 2007. *Stiphodon rubromaculatus*, a new species of freshwater goby from Futuna Island (Gobioidi: Sicydiinae). *Cybiurn* 31(1):45-49.
- Keith, P., Marquet, G. and Watson, R. E. 2008. *Akihito futuna*, a new species of freshwater goby from the South Pacific (Gobioidi: Sicydiinae). *Cybiurn* 31(4):471-476.
- Keith, P., Lord, C., Lorion, L., Watanabe, S., Tsukamoto, K., Couloux, A. and Dettai, A. 2011. Phylogeny and biogeography of Sicydiinae (Teleostei: Gobiidae) inferred from mitochondrial and nuclear genes. *Marine Biology* 158(2):311-326.
- Keogh, S. J., Scott, A. W., Fitzgerald, M. and Shine, R. 2003. Molecular phylogeny of the Australian venomous snake genus *Hoplocephalus* (Serpentes, Elapidae) and conservation genetics of the threatened *H. stephensii*. *Conservation Genetics* 4:57-65.
- Keogh, S. J., Edwards, D. L., Fisher, R. N. and Harlow, P. S. 2008. Molecular and morphological analysis of the critically endangered Fijian iguanas reveals cryptic diversity and a complex biogeographic history. *Phil. Trans. R. Soc. B.* 363:3413-3426.
- Kinghorn, J. R. 1928. Herpetology of the Solomon Islands. *Rec. Austral. Mus.* 16:123-178.
- Kinghorn, J. R. 1937. A new species of skink from the Solomon Islands. *Records of the Australian Museum* 20(1):1-2.
- Koch, A., Arida, E., Schmitz, A., Böhme, W. and Ziegler, T. 2009. Refining the polytypic species concept of mangrove monitors (Squamata: *Varanus indicus* group): a new cryptic species from the Talaud Islands, Indonesia, reveals the underestimated diversity of Indo-Australian monitor lizards. *Australian Journal of Zoology* 57(1):29-40.
- Mayr, E. 1931. Birds collected during the Whitney South Sea Expedition. XVI. Notes on fantails of the genus *Rhipidura*. *American Museum Novitates* 502:1-21
- McCoy, M. 1980. *Reptiles of the Solomon Islands*. Wau Ecology Institute Handbook 7. Wau Ecology Institute, Wau, Papua New Guinea.
- McCoy, M. 2006. *Reptiles of the Solomon Islands*. Pensoft Series Faunistica 57:212 pp.
- McDiarmid, R. W., Campbell, J. A. and Touré, T. A. 1999. *Snake species of the world. Vol. 1*. Herpetologists' League:511 pp.
- McDowell, S. B. 1970. On the status and relationships of the Solomon Island elapid snakes. *Journal of Zoology*, London 161:145-190.
- McDowell, S. B. 1979. A catalogue of the snakes of New Guinea and the Solomons, with special reference to those in the Bernice P. Bishop Museum. Part III. Boinae and Acrochordoidea (Reptilia: Serpentes). *Journal of Herpetology* 13:1-92.
- Medway, L. 1974. A new skink (Reptilia: Scincidae: genus *Emoia*) from the New Hebrides, with comments on the status of *Emoia samoensis loyaltiensis* (ROUX). *Bull. Brit. Mus. Nat. Hist., London*, 27:53-57.
- Mertens, R. 1928. Neue Inselrassen von *Cryptoblepharus boutonii* (Desjardin). *Zool. Anz.* 78:82-89.
- Mertens, R. 1931. *Ablepharus boutonii* (DESJARDIN) und seine geographische Variation. *Zool. Jahrb. Syst.* 61:63-210.
- Montrouzier 1860. [Untitled note on *Boa australis*]. *Rev. et Mag. Zool.*xii:95.
- Morrison, C. 2003. *A Field Guide to the Herpetofauna of Fiji*. Suva, Fiji: Institute of Applied Sciences, University of the South Pacific:121 pp.
- Mys, B. 1988. The zoogeography of the scincid lizards from North Papua New Guinea (Reptilia: Scincidae). I. The distribution of the species. *Bull. Inst. Roy. Sci. Nat. Belgique (Biologie)* 58:127-183.
- Ogilby, J. D. 1890. Report on a zoological collection from the Solomon Islands. Part 2. *Rec. Austr. Mus.* 1:5-7.
- Ota, H., Fisher, R. N., Ineich, I., Case, T. J., Radtkey, R. R. and Zug, G. R. 1998. A new *Lepidodactylus* (Squamata: Gekkonidae) from Vanuatu. *Herpetologica* 54(3):325-332.
- Oxley, B. 2016. *Living National Treasures*, website at: <http://Intreasures.com/vanuatu.html>
- Parker, J. 2012. *Candoia*. *HerpNation* (9):52-60.
- Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity*. University of California Press, Berkeley:347 pp.
- Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.
- Rahmstorf, S. 2003. Thermohaline circulation: The current climate. *Nature* 421(6924):699-699. doi:10.1038/421699a. PMID 12610602.
- Reeder, T. W. 2003. A phylogeny of the Australian *Sphenomorphus* group (Scincidae: Squamata) and the phylogenetic placement of the crocodile skinks (*Tribolonotus*): Bayesian approaches to assessing congruence and obtaining confidence in maximum likelihood inferred relationships. *Molecular Phylogenetics and Evolution* 27:384-397.
- Richmond, J. Q., Wood, D. A., Stanford, J. W. and Fisher, R. N. 2014. Testing for multiple invasion routes and source populations for the invasive brown treesnake (*Boiga irregularis*) on Guam: implications for pest management. *Biological Invasions*. 19 June:13 pp.
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").
- Rittmeyer, E. N. and Austin, C. C. 2015. Combined next-generation sequencing and morphology reveal fine-scale speciation in Crocodile Skinks (Squamata: Scincidae: *Tribolonotus*). *Mol. Ecol.* 2015 Jan, 24(2):466-83. doi: 10.1111/mec.13030. Epub 2015 Jan 9.
- Robinson, G. S. 1974. *Macrolepidoptera of Fiji and Rotuma: a taxonomic and biogeographic study*.
- Durham theses, Durham University. Available at Durham E-Theses Online: <http://etheses.dur.ac.uk/8237/>
- Rodda, G. H. and Fritts, T. H. 1992. The Impact of the Introduction of the Colubrid Snake *Boiga irregularis* on Guams Lizards. *Journal of Herpetology* 26(2):166-174.
- Rodda, G. H. and Savidge, J. A. 2010. Biology and Impacts of Pacific Island Invasive Species. 2. *Boiga irregularis*, the Brown Tree Snake (Reptilia: Colubridae). *Pacific Science* (2007), 61(3):307-324.
- Rodda, G. H., Fritts, T. H., McCoid, M. J. and Campbell, E. W. III. 1999. An overview of the biology of the Brown Tree-snake, *Boiga irregularis*, a costly introduced pest on Pacific Islands. pp. 44-80 in Rodda, G. H. Sawai, Y., Chiszar, D. and Tanaka, H. (eds.), *Problem snake management: The Habu and the Brown Tree-snake*. Cornell University Press, Ithaca, New York.
- Russell, E. and Coupe, S. 1984. *The Macquarie World Illustrated Atlas*. Kevin Weldon, Macquarie Library, Chatswood, NSW, Australia:511 pp.
- Roemmich, D. 2007. Physical oceanography: Super spin in the southern seas. *Nature* 449(7158):34-35. doi:10.1038/449034a. PMID 17805284.
- Roux, J. 1913. Les reptiles de de la Nouvelle-Calédonie et des îles Loyalty. pp. 79-160 in: *Nova Caledonia, Recherches scientifiques en Nouvelle Calédonie et aux Iles Loyalty*. *Zoologie*. (vol. 1, L. 2). Sarasin, F. and Roux, J. (eds.). C.W. Kreidel's Verlag, Wiesbaden,

Sadler, R. A. and Bauer, A. M. 1997. The terrestrial herpetofauna of the Loyalty Islands. *Pacific Sci.* 51(1):76-90.

Schmidt, D. 2010. Vermehrung und Zucht von Riesenschlangen. *Draco* 11(44):4-17.

Schmidt, K. P. 1932. Reptiles and Amphibians from the Solomon Islands. *Field Mus. Nat. Hist. Zool. Ser.* 18(9):175-190.

Schmidt, K. P. and Burt, C. E. 1930. Herpetological results of the Whitney South Sea Expedition V. Description of *Emoia sanfordi*, a new lizard from islands of the Western Pacific (Scincidae). *American Museum Novitates* (436):1-3.

Schweizer, H. 1970. Farbwechsel bei einer Pazifik-Boa (*Candoia bibroni australis* Montrousier, 1860). *Aqua Terra* 7(2):19-22.

Sibley, C. G. and Monroe, B. L. 1990. *Distribution and taxonomy of birds of the world*. Yale University Press, New Haven, USA:xxiv+1111 pp.

Stull, O. G. 1956. Description of a new subspecies of the boid snake, *Enygrus carinatus*. *Copeia* 1956(3):185-186.

VCAT 2015. *Hoser v Department of Environment Land Water and Planning (Review and Regulation)* [2015] VCAT 1147 (30 July 2015).

Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* (1):1-61.


Williams, E. E. and Parker, F. 1964. The snake, genus *Parapistocalamus* on Bougainville, Solomon Islands. *Senckenberg. biol.* 45:543-552.

Zug, G. R. 2012. A new species of treeskink (Squamata: Scincidae: *Emoia samoensis* species group) from Rotuma, south-central Pacific. *Proceedings of the Biological Society of Washington* 125(1):74-84.

Zug, G. R. 2013. *Reptiles and Amphibians of the Pacific Islands*. University of California Press, Berkeley, USA:306 pp.

CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.



Corporate Design
Et Print Solutions

No.22145

TAX INVOICE

Kwik Kopy Printing Box Hill
3/1031 Whitehorse Road
Box Hill VIC 3128
t: 039 899 0833 | f: 039 899 0536
ABN: 65 740 679 782

CONTACT
Australasian Journal of Herpetology

INVOICE DETAILS
Issue Date: 21/09/2015
Ship Via:

QUANTITY	DESCRIPTION	VALUE Ex. GST
50	Australasian Journal of Herpetology Issue 31 - 64 page document printed black and white on 128gsm gloss and 250gsm gloss cover in colour	\$227.27
50	Australasian Journal of Herpetology Issue 32 - 64 page document printed black and white on 128gsm gloss and 250gsm gloss cover in colour	\$227.27

RECEIVED BY:

Terms: **Please refer to terms & conditions of trade** Account customers, please pay in full, on pickup. We accept Payment no statement issued, C.O.D. customers please pay in full, on pickup. We accept Payment via EFT POS, Mastercard, Visa & Amex. All card transactions will incur a 2% surcharge You can deposit directly into our bank account, E. & O.E All claims and returned goods are to be accompanied by this invoice, and made within 7 days of receipt of goods

DATE:

SUBTOTAL \$454.54
GST \$45.45
TOTAL \$499.99
AMOUNT DUE \$499.99

CUSTOMER: Australasian Journal of Herp

INVOICE No.: 22145

INVOICE Tot.: \$499.99

REMITTANCE ADVICE: RETURN WITH PAYMENT

Method: **Suechess Pty Ltd | Bank: Westpac | BSB: 033 172 | Acc: 334 219**

Amount: \$

Card No.:

Name:

CASH CHEQUE OTHER*

Expires: Date:

CCV:

*see terms of trading for conditions of payment by other methods

Something for everyone.

