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ABSTRACT

An ongoing audit of Australian frogs, relying on morphological and molecular studies has identified a number of divergent lineages, including hitherto unnamed forms.

These most recent results are published in similar format to earlier cited papers of Hoser (2016a, 2016b, 2016c, 2019a, 2020a, 2020b, 2020c, 2020e and 2020f) that named frog taxa.

Adopting the taxonomy and nomenclature of Anstis (2013) and Cogger (2014) as the prevailing usage, the following taxonomic changes are made:

The genus *Philoria* Spencer, 1901 is split three ways with one new genus being erected.

The putative species *Philoria loveridgei* Parker, 1940, herein placed in a new genus is also split five ways, with four new species formally named for the first time.

The genus *Pseudophryne* Fitzinger, 1843 is split six ways using available names for two other groups and erecting genera for three other clades. Several new species within *Pseudophryne sensu lato* from four genera are also formally named.

The putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 are rearranged as a single genus and split into six subgenera, with two groups formally named as new subgenera for the first time. New species within *Crinia* are also formally named.

The genus *Geocrinia* Blake, 1973 as currently recognized is formally split into two with the second genus formally named for the first time as *Wellingtondella gen. nov.*, with a type species of *Crinia rosea* Harrison, 1927. *Hesperocrinia* Wells and Wellington, 1985, type species: *Crinia leai* Fletcher, 1898 is resurrected as a subgenus within *Geocrinia*, but in a totally different concept to that originally conceived by Wells and Wellington (1985).

Two new species within subgenus *Hesperocrinia* and three new subspecies within *Geocrinia* are also formally named.

The putative species *Paracrinia haswelli* (Fletcher, 1894) is split into three well defined species on the basis of allopatry and morphological divergence, two formally named for the first time.

The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nicholli* Harrison, 1927 is split into three species, each being morphologically and genetically divergent.

Uperoleia Gray, 1841 is divided into two genera while a further two subgenera within remaining *Uperoleia* are recognized. One subgenus *Quasiuperoleia subgen. nov.* is formally named for the first time, while available names, *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 (as a subgenus) are resurrected. Two new species within genus *Hosmeria*, four new species and two new subspecies within subgenus *Prohartia* and four species and one subspecies in subgenus *Uperoleia* are formally named for the first time.

A subspecies of Barred River Frog, *Mixophyes hoserae* Hoser, 2020 (Oxyslopidae) from North-east Victoria and nearby New South Wales is formally named.

Myobatrachidae is also divided into four tribes and two further subtribes, all but the nominate tribe formally named for the first time.

Keywords: Frogs; Australia; New South Wales; Queensland; Western Australia; South Australia; Victoria; nomenclature; taxonomy; ICZN; *Philoria*; *Kyarranus*; *Pseudophryne*; *Bufo*; *Gradwellia*; *Kankanophryne*; *Crinia*; *Ranidella*; *Tylerdella*; *Metacrinia*; *Bryobatrachus*; *Geocrinia*; *Hesperocrinia*; *Uperoleia*; *Prohartia*; *Hosmeria*; *Mixophyes*; *Paracrinia*; *australis*; *bibroni*; *occidentalis*; *guentheri*; *robinsoni*; *douglasi*; *coriacea*; *corroboree*; *nicholli*; *pengilleyi*; *dendyi*; *semimarmorata*; *haswelli*; *raveni*; *major*; *covacevichae*; *borealis*; *laevigata*; *lithomoda*; new tribes; Myobatrachini; Uperoleiaini; Wellingtondellaini; Criniaini; new subtribes; Oxyphryneina; Spicospinaina; Paracriniaina; new genus; *Bogophryne*; *Sloppophryne*; *Crottyphryne*; *Oxyphryne*; *Wellingtondella*; new subgenus; *Oxydella*; *Lowingella*; *Quasiuperoleia*; new species; *uterbog*; *duboisii*; *breonnataylorae*; *naomiosakaae*; *crotalusei*; *maxinehoserae*; *katrinahoserae*; *marcdorsei*; *hoserae*; *woolfi*; *euanedwardsi*; *scottgranti*; *jasminegrantae*; *martinekae*; *wellsi*; *wellingtoni*; *oxeyi*; *crottyi*; *sloppi*; *lowingae*; *stevebennetti*; *maateni*; *merceicai*; *brettbarnetti*; *brianbarnetti*; *lenhoseri*; *funki*; *bettyswileae*; *wilhelminahughesae*; *shuddafakup*; *shirensbogensis*; *jadeharrisae*; *keilleri*; *lowryi*; *shanescarffi*; *margweeksae*; *grantturneri*; *gedyei*; *rossignolii*; new subspecies; *oxyi*; *sadlieri*; *mensforthi*; *burrelli*; *kaputarensis*; *otwaysensis*; *grampiansensis*; *logani*; *maximus*; *divergans*; *jackyae*.

INTRODUCTION

An ongoing audit into Australian frogs, has viewed previously named species and populations with a view to confirming that all were classified correctly, as in conformed to existing species and genus-level classifications.

In all relevant cases, putative genera and species were checked against morphological and molecular studies, with reference to living and preserved specimens of each taxon to confirm or refute the contention they were of the putative taxon.

When more than one taxon appeared to be lumped in a putative single taxon, they were further investigated to confirm A/ They were taxonomically divergent and distinct and B/ If so, whether or not they had an available name.

Earlier papers, arising from this audit, that formally named new taxa of frog include the following:

Hoser (2016a, 2016b, 2016c, 2019a, 2020a, 2020b, 2020c, 2020e and 2020f).

The purpose of this paper is to name further forms from taxonomically neglected genera of mainly small frogs within the Myobatrachidae (with one exception), not previously recognized by science at all relevant levels below that of family.

The exceptional taxon is a subspecies of Barred River Frog, *Mixophyes hoserae* Hoser, 2020 (Oxyslopidae) from North-east Victoria and nearby New South Wales that is formally named for the first time. Few specimens have been caught and it the subspecies is at risk of extinction.

Myobatrachidae was also assessed as a whole and was determined to warrant being split into four divergent tribes.

MATERIALS AND METHODS

These are as for Hoser (2020c) and general comments about the formal descriptions within that paper also apply herein, including that all relevant details are for normal adult specimens in good health and normal conditions by day unless otherwise stated.

Live specimens, including tadpoles, when available, were examined, as were dead specimens in museums, photographs and all relevant literature.

Relevant literature relied upon in terms of the taxonomic conclusions within this paper are best grouped by putative genera (at the outset of this paper being prepared) and relying on the widely accepted taxonomy and nomenclature of Cogger *et al.* (1983), Cogger (2014) and Anstis (2013) as the names applied to each species or genus prior to the publication of this paper. It should be noted that sources cited within each paper are also relied upon and to save space, most of these have not been explicitly cited.

In terms of the putative genus *Phyloria* Spencer, 1901 and in particular the putative species *Phyloria*

loveridgei Parker, 1940, key references of relevance included: Anstis (2013), Barker *et al.* (1995), Berger *et al.* (1999), Cogger (2014), Cogger *et al.* (1983), Donnellan *et al.* (2012), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Heyer and Liem (1976), Hoser (2007), Ingram and Corben (1975), Knowles *et al.* (2004), Moore (1958), Parker (1940), Pyron and Wiens (2011), Shea (2005), Spencer (1901), Stuart *et al.* (2008), Tyler and Knight (2009), Wells and Wellington (1984, 1985).

In terms of the putative genus *Pseudophryne* Fitzinger, 1843 *sensu lato* and newly identified taxa within this paper, key references of relevance included: Ananjeva *et al.* (1988), Andersson (1916), Anstis (2013), Barker *et al.* (1995), Boulenger (1882), Byrne and Silla (2020), Cochran (1961), Cogger (2014), Cogger *et al.* (1983), Colefax (1956), Coventry (1970), Donnellan *et al.* (2012a), Duméril and Bibron (1841, 1854), Eipper and Rowland (2018), Ellis *et al.* (2017), Fitzinger (1843), Fletcher (1898), Frank and Ramus (1995), Frost *et al.* (2006), Girard (1853), Gray (1835, 1845), Guibé (1950), Günther (1858), Harrison (1927), Heyer and Liem (1976), Hoser (1989), Howitt *et al.* (1891), Ingram and Corben (1994), Ingram *et al.* (1993), Iverson *et al.* (2001), Keferstein (1868), Lawrence *et al.* (2018), Loveridge (1933b, 1935), Lucas (1892), Main (1964), Martin and Littlejohn (1982), Moore (1953, 1961), Morgan *et al.* (2008a, 2008b), Osborne *et al.* (1996), Parker (1940), Péron (1807), Perry (2004), Pyron and Wiens (2011), Roberts and Maxson (1989), Stauber (1999, 2006), Shea (1988), Shea and Rowley (2018), Stuart *et al.* (2018), Thumm and Mahony (2002), Tyler (1978, 1992), Tyler and Davies (1980), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1994), Wells and Wellington (1984, 1985).

In terms of the putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 *sensu lato* (as defined by earlier authors) and newly identified taxa within this paper, key references of relevance included: Ananjeva *et al.* (1988), Anstis (2013), Barbour and Loveridge (1929), Barendse (1984), Blackwell and Bull (1978), Blake (1973), Barker *et al.* (1995), Bauer *et al.* (1996), Bush *et al.* (2010), Bossuyt and Roelants (2009), Boulenger (1882), Cogger (2014), Cogger *et al.* (1983), Condon (1941), Cope (1865, 1866, 1867), Donnellan *et al.* (2012b), Doughty *et al.* (2009), Duméril and Bibron (1841), Edwards (2007), Eipper and Rowland (2018), Ellis *et al.* (2017), Frost *et al.* (2016), Girard (1853, 1858), Günther (1858, 1864, 1867, 1869), Heyer and Liem (1976), Heyer *et al.* (1982), Holthius (1988), Hoser (1989, 2007), Ingram *et al.* (1993), International Commission of Zoological Nomenclature (1991), Keferstein (1867, 1868), Liem and Ingram (1977), Littlejohn (1957, 1958, 2008), Littlejohn and Martin (1965), Loveridge (1933a, 1933b, 1934, 1935), Lütken (1864), Main (1957), Malnate (1971), Martin and Littlejohn (1982),

Martin *et al.* (1980), Menzies (2006), Moore (1954), Odendaal and Bull (1982), Odendaal *et al.* (1983), Parker (1940), Parker (1881), Péron (1807), Peters (1863), Pyron and Wiens (2011), Read *et al.* (2001), Reynolds (2007), Roberts (2010), Rounsevell *et al.* (1994), Shea (1987), Shea and Kraus (2007), Shea and Rowley (2018), Shea and Sadlier (1999), Shine (1987), Steindachner (1867), Straughan and Main (1966), Stuart *et al.* (2008), Symula *et al.* (2008), Thompson (1981), Tiedemann and Grillitsch (2000), Thompson (1981), Tschudi (1838), Tyler (1976, 1978, 1985), Tyler and Parker (1974), Tyler *et al.* (1984), Vanderduys (2012), Waite (1929), Wells and Wellington (1984, 1985).

In terms of the putative genus *Geocrinia* Blake, 1973 *sensu lato* as currently recognized by Anstis (2013) and Cogger (2014) key references of relevance included: Anstis (2010, 2013), Barker *et al.* (1995), Bauer *et al.* (1996), Blake (1973), Boulenger (1888), Bush *et al.* (2010), Cogger (1979, 2014), Cogger *et al.* (1983), Driscoll (1998), Edwards (2007), Fletcher (1891, 1898), Frank and Ramus (1975), Frost *et al.* (2016), Gollmann (1991), Günther (1864), Harrison (1927), Harrison and Littlejohn (1985), Hero *et al.* (1991), Heyer and Liem (1976), Holthius (1988), Hoser (2017), International Commission of Zoological Nomenclature (1991), Keferstein (1868), Littlejohn and Martin (1964), Loveridge (1935), Main (1963), Martin and Littlejohn (1982), Nieden (1923), Parker (1940), Pyron and Wiens (2011), Read *et al.* (2001), Roberts *et al.* (1990), Shea (1987), Shea and Sadlier (1999), Shine (1987), Stuart *et al.* (2008), Tyler (1988, 1992), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1994), Walker and Goonan (2000), Wardell-Johnson and Roberts (1989), Wells and Wellington (1984, 1985), Werner (1914).

Literature relevant to the putative species *Paracrinia haswelli* (Fletcher, 1894) *sensu lato* until now treated as a monotypic species for the genus as currently recognized by Anstis (2013) and Cogger (2014) included: Ananjeva *et al.* (1988), Anstis (2013), Cogger (2014), Cogger *et al.* (1983), Fletcher (1894), Frank and Ramus (1995), Frost *et al.* (2006), Heyer and Liem (1976), Loveridge (1935), Moore (1961), Parker (1940), Pyron and Wiens (2011), Shea and Sadlier (1999), Tyler and Knight (2009).

Key references relevant to the until now monotypic genus *Metacrinia* Parker, 1940, as currently recognized by Anstis (2013) and Cogger (2014) with the type species *Pseudophryne nichollsi* Harrison, 1927 include: Anstis (2013), Barker *et al.* (1995), Burton (2001), Bush *et al.* (2010), Cogger (2014), Cogger *et al.* (1983), Edwards (2007), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Harrison (1927), Heyer and Liem (1976), Parker (1940), Pyron and Wiens (2011), Read *et al.* (2001), Roberts and Maxson (1989), Shea and Sadlier

(1999), Tyler and Doughty (2009), Tyler and Knight (2009).

Key references relevant to the genus *Uperoleia* Gray, 1841 *sensu lato*, including the putative genera *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 include: Agassiz (1846), Andersson (1916), Anstis (2013), Barker *et al.* (1995), Boulenger (1882), Bush *et al.* (2010), Catullo and Scott Keogh (2014), Catullo *et al.* (2011, 2014a, 2014b), Clulow *et al.* (2016), Cogger (2014), Cogger *et al.* (1983), Davies (1987), Davies and Littlejohn (1986), Davies and Martin (1988), Davies *et al.* (1985, 1986, 1992, 1993), Doughty and Roberts (2008), Eipper and Rowland (2018), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Gray (1841), Holthius (1988), Ingram *et al.* (1993), International Commission of Zoological Nomenclature (1991), Keferstein (1867), Loveridge (1933, 1935), Lynch (1971), Main (1965), Main and Storr (1966), Menzies (2006), Moore (1961), Parker (1940), Parker (1881), Pyron and Wiens (2011), Reynolds (2007), Shea (1987), Shine (1987), Tyler (1985, 1992), Tyler and Davies (1984), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1981a, 1981b, 1981c, 1983, 1994), Wells and Wellington (1984, 1985), Young *et al.* (2005).

References relevant to the species *Mixophyes hoseerae* Hoser, 2020 are listed in full in Hoser (2020b) and are not repeated here.

A pdf of that paper can be downloaded at:

<http://www.smuggled.com/issue-43-pages-15-26.pdf>

RESULTS

These are summarized in the abstract and given as follows taking Cogger (2014) as the prevailing usage of taxonomy and nomenclature for the relevant groups of genera and species.

The genus *Philoria* Spencer, 1901 is split three ways with one new genus being erected.

The genus *Kyarranus* Moore, 1958 is resurrected from the synonymy of *Philoria* Spencer, 1901, where it had been assigned by most recent authors since the publication of Cogger *et al.* (1983).

I note that Wells and Wellington (1985) correctly resurrected the genus *Kyarranus* and also correctly pointed out that putative *K. sphagnicolus* Moore, 1958 was “a species complex”.

Wells and Wellington (1985) were fully vindicated by the publication of Knowles *et al.* (2004), who effectively split the species *K. sphagnicolus* four ways, formally naming two new species based on molecular and morphological divergence and also recognizing the affiliated species *Kyarranus kundagungan* Ingram and Corben, 1975.

While evidently relying on Wells and Wellington (1985) as the basis for their further studies, Knowles *et al.* (2004) quite scandalously did not cite the work of Wells and Wellington (1985).

The putative species *Philoria loveridgei* Parker, 1940,

herein placed in a new genus is also split five ways, with four new species formally named for the first time. One of the new species is type for the new genus, as the true species level identity of the holotype of *P. loveridgei* is uncertain, save for the fact that it is not one of the four newly described forms, all of which until now have been treated by herpetologists as *P. loveridgei*.

These species have been separated in molecular studies and are also morphologically divergent from one another, as well as the type specimen of *Philoria loveridgei* Parker, 1940. The putative taxon *Philoria loveridgei* Parker, 1940 has long been recognized as being divergent from other members of the genus *Philoria*, morphologically, in terms of reproductive biology and in molecular studies, meaning the new genus-level assignment of this species will not come as a surprise to anyone who has worked with this putative species and the type species of *Philoria* (*P. frosti* Spencer, 1901 from Mount Baw Baw, Victoria) and those species from NSW and Queensland now placed in the genus *Kyarrannus*.

The genus *Pseudophryne* Fitzinger, 1843 is split six ways using available names for two groups of species and erecting three new genera.

The correction of the taxonomy of this putative genus was attempted in part by Wells and Wellington (1985) and with available names for most species past that date, it is a pity that at least some of these names have not been made widely known and used since. This paper takes that overdue step.

It is notable that I do not agree with the taxonomy of Wells and Wellington (1985), while also recognizing their valiant efforts in making sense of Australian frog taxonomy and nomenclature.

While it could be argued that *Pseudophryne* could have been left as a single morphologically conservative genus, with simple recognition of five other subgenera, this contention is rejected for several reasons.

As is evident from this paper, the species diversity of the group has been seriously underestimated, meaning the genus *sensu lato* includes a large number of species, in which some are clearly not particularly close to others. On top of that, the divergences between the groups, formally identified and named at the genus level are on par with, or greater than other genus-level splits, currently widely recognized in Australian frogs.

New species within *Pseudophryne sensu lato* are also formally named for the first time, these being within four of the six newly recognized genera. In effect this makes just one of the six relevant genera monotypic.

The genus name *Kankanophryne* Heyer and Liem, 1976, type species *Pseudophryne occidentalis* Parker, 1940 is resurrected.

The putative species *K. occidentalis* (Parker, 1940) is

split four ways, with three formally named for the first time. The species originally described as *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012 is placed in a new genus *Sloppophryne gen. nov.*

The species originally described as *Pseudophryne douglasi* Main, 1964 is divided into two and placed in a new genus *Crottyphryne gen. nov.*

An argument could be raised to place all eastern Australian *Pseudophryne sensu lato* into a single genus, based on lesser divergence as compared to western species, or alternatively treat the main 2 or 3 groups as subgenera.

The preceding arguments however still apply and this is rejected.

Hence the eastern Australian species are placed in three genera, namely *Pseudophryne*, *Buфонella* and *Oxyphryne gen. nov.* the last of which is clearly most closely associated with *Buфонella*, but so morphologically divergent from those species as to warrant their own genus.

Oxyphryne gen. nov. are the so-called Corroboree frogs from Alpine areas of south-east Australia.

Cogger *et al.* (1983) found that some of the syntype material of species *Pseudophryne bibronii* Günther, 1858 as originally described, included what was in fact a specimen of the species more recently known as *Pseudophryne guentheri* Boulenger, 1882, that single specimen being the only one available and known to still exist.

This meant that the later name could have been a junior synonym of *Pseudophryne bibronii*.

Cogger *et al.* (1983) repeated what was said by Moore (1961) and said they deferred from using the correct nomenclature on the alleged basis it would overturn existing usage. However a massive hole in that argument was raised by Wells and Wellington (1985), who wrote:

"*Pseudophryne bibronii* Günther, 1858. A complex of several undescribed species."

In 1989, they also described a new taxon in the same alleged complex as *P. barkeri* Wells and Wellington, 1989.

However Shea and Rowley (2018) dealt with the nomenclatural issues surrounding the name *P. bibronii* in an unusual way, by using a series of inferences and a potentially creative interpretation of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Most significantly, they effectively sank the name *P. barkeri*, by designating a lectotype for *P. bibronii*, that museum specimen being an alleged specimen from the type series, (by alleged literature reference) the same specimen being previously identified as "*Phryniscus australis*".

Both this lectotype and *P. barkeri* being of the form from the Cumberland Plain (Sydney), New South

Wales.

This action by Shea and Rowley (2018) assigned the name *P. bibronii* to the Sydney basin form of the species complex, thereby giving this name formal name priority over the now synonym name *P. barkeri*. A more sensible and ethical way to have dealt with the matter and without having to rely on a series of highly questionable inferences as published by Shea and Rowley (2018), would have been to simply synonymise *P. guentheri* Boulenger, 1882, with *P. bibroni*, by way of making the only available physical syntype specimen (as cited at time of original description) and referred to in Cogger *et al.* (1983) as the only logical lectotype.

In doing so, the name *P. barkeri* would have been the logical available and correct name for the Sydney form of putative *P. bibroni*.

The name *P. guentheri* Boulenger, 1882 would instead have been sunk into synonymy.

It goes without saying that Shea and Rowley (2018), engaged in their mental gymnastics including creative interpretations of the historical record and of the *International Code of Zoological Nomenclature* published in their paper in the notorious PRINO (Peer reviewed in name only) online "journal" called *Zootaxa* to designate a lectotype for *P. bibronii* with the clear intent of using it as a vehicle to formally sink the name *P. barkeri* Wells and Wellington, 1989. This was merely the most recent part of a long-going vendetta by Shea against Wells and Wellington, which goes as far back as the 1980's when he unsuccessfully petitioned the ICZN to formally suppress works of Wells and Wellington; see Shea (1987) and International Commission of Zoological Nomenclature (ICZN) (1991).

As this paper identifies regionally divergent forms previously incorrectly referred to *P. bibronii* as new species, these must invariably be assigned names. As the majority of these taxa have no available names, the unnamed ones must have new names assigned.

I note that in terms of nomenclatural stability within the ambit of the current (fourth) edition of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), the most logical solution to the problems of identification and naming of the relevant species of frog is by strict application of the code, including the rules of homonymy and priority.

However, taking steps to change the malicious nomenclatural actions of Shea and Rowley, will only worsen an already unsatisfactory situation and create new tensions which could easily be avoided.

Therefore in the interests of the stated aims of the Code, being nomenclatural stability, I accept their designation of assignment of a lectotype for *P. bibroni*, being the Sydney basin form of the putative species and herein for the purposes of this paper and the present date, do not recognize or use the name

P. barkeri on the basis of the unethical revisionary work by Shea and Rowley (2018).

All other known to be unnamed eastern Australian populations of putative *Pseudophryne bibronii* as identified in contemporary texts such as Cogger (2014 and Anstis (2013) are herein formally described as new species within the redefined genus *Pseudophryne* based on morphological and molecular divergence and presumed breeding allopatry.

In the relevant descriptions within this paper, all six genus groups within the previously defined genus *Pseudophryne sensu* Cogger (2014) and Anstis (2013) are properly defined and diagnosed, with species content also clearly identified.

This is done on the basis that this is the first formal revision of this sizeable assemblage based on both molecular data and morphology and it is likely that the genus-level arrangement will become widely used quite rapidly, including via identification manuals.

In terms of putative *P. bibroni*, the following is noted.

Two species described that are closely associated with putative *P. bibronii* are *P. dendyi* Lucas, 1892 and *P. semimarmorata* Lucas, 1892, both being recognized within this paper.

Some authors have regarded the preceding taxa as conspecific with *P. bibronii* and the molecular study of Donnellan *et al.* (2012) confirmed that some populations of putative *P. bibronii* are in fact more closely related to those species than they are to the nominate (Sydney) form of *P. bibroni*.

However it is also clear that recognition of both *P. dendyi* Lucas, 1892 and *P. semimarmorata* Lucas, 1892 as valid species is also appropriate.

With that in mind, all the preceding species were looked at collectively and in the descriptions that follow of unnamed forms, all are formally separated from one another.

In finality, two divergent forms of putative *P. bibronii* from South Australia are formally named as new species as originally indicated in Anstis (2013), being *P. scottgranti* sp. nov. and *P. jasminegrantae* sp. nov.. While flagged as unnamed species within the *P. bibronii* complex nearly a decade back, they have not been formally named on the basis that to do so would be a grudging admission that Wells and Wellington had got their summation of putative *P. bibronii* correct in 1985. In doing this, a number of noisy so-called herpetologists in Australia would have effectively had 35 years worth of hate and lies and ridicule against the taxonomic and nomenclatural judgements of Wells and Wellington shown up for what they were all along.

That is, without any basis of fact!

Pressure has been brought to bear on people to not recognise or formally name either taxon.

Quite simply, I put the scientific good and the needs of wildlife conservation ahead of a time-wasting war

against Wells and Wellington by ego-centric so-called scientists, who clearly would rather species become extinct, than dare admit that their nemesis Wells and Wellington had actually done some useful work in herpetology (see Hoser 2019b, 2019c).

I put conservation in front of hate campaigns and so have no hesitation in naming the two relevant species, noting that they were flagged as distinct as far back as 1985 (Wells and Wellington, 1985), again in 2013 (Anstis, 2013) and yet as of late 2020 remained unnamed and unrecognized by scientists and government wildlife conservation agencies alike! A population of putative *P. bibronii* from the Adelaide region is formally named as a subspecies of *P. semimarmorata*, based on its close phylogenetic relationship to that taxon, being *P. semimarmorata burrelli* sp. nov..

The population of putative *P. bibronii* from northern Victoria and nearby parts of South Australia is formally named as a new species *P. martinekae* sp. nov..

Putative *P. bibronii* from the lower elevations of the southern highlands of New South Wales and elevated locations north and west of there are formally named as a subspecies of *P. dendyi*, being *P. dendyi mensforthi* sp. nov..

Putative *P. bibronii* from the dunes and melaleuca swamps north of Newcastle on the New South Wales north coast are formally named *P. wellsii* sp. nov.. The New England Tableland form of putative *P. bibronii* is formally named *P. wellingtoni* sp. nov., while the divergent population from the Mount Kaputar outlier is herein formally named as *P. wellingtoni kaputarensis*.

Within the resurrected genus *Bufo* Girard, 1853, until now synonymised with *Pseudophryne* Fitzinger, 1843, the putative species *B. australis* (Gray, 1835) is divided into two, with the new species *B. hoserae* sp. nov. also split into two allopatric subspecies.

Putative *B. coriacea* Keferstein, 1868 is split three ways, with the new species *B. wolffi* sp. nov. and *B. euanedwardsi* sp. nov. formally named.

The putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 are rearranged as a single genus and conservatively split into six subgenera, with one group formally named as new subgenus. There is a strong argument in favour of all six groups being recognized as separate genera as done to at least a limited extent by some authors (e.g. Cogger *et al.* 1983 or Wells and Wellington, 1985) and I leave this option available for later authors.

The genera resurrected from synonymy as subgenera are *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974 and *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus*

Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994.

A new subgenus *Oxydella* subgen. nov. including the complex of species associated with "*Ranidella deserticola* Liem and Ingram, 1977" is erected for the fifth clade in the the genus *Crinia*.

Until now, treated as a single putative species, *Crinia* (*Ranidella*) *deserticola* (Liem and Ingram, 1977), this obvious complex of species, is broken up four ways, with three obviously divergent forms formally named as new species. There may be others awaiting formal description, these being most likely in the Northern Territory.

To get a good indication as to how different the relevant species are, one simply needs to look at the image of the tadpole jaw for nominate *C. deserticola* from south-western Queensland, Australia in the original description on page 256 of Liem and Ingram (1977) and match it up with the image of the tadpole jaw for putative *C. deserticola* from Mareeba, Queensland, Australia herein treated as a new species *C. oxeyi* sp. nov. and note the obvious differences, including for example two well formed upper rows of teeth in *C. deserticola*, versus just one in *C. oxeyi* sp. nov..

The complex of divergent species including *Crinia parinsignifera* Main, 1957, *C. tinnula* Straughan and Main, 1966 and at least three until now undescribed species are formally placed into a new subgenus *Lowingdella* subgen. nov., type species *Crinia* (*Lowingdella*) *lowingae* sp. nov. from New South Wales.

In summary *C. tinnula* is effectively split 3 ways, noting genetic evidence for the split was published 19 years prior, with one of those species being *C. lowingae* sp. nov. and a northern population of putative *C. parinsignifera* is formally identified and named as a consistently morphologically divergent species.

I also note the audit of relevant species confirmed that the species *Crinia georgiana* Tschudi, 1838, as currently recognized (*sensu* Cogger 2014 or Anstis 2013) is in fact two well defined and allopatric species.

Their identification as two divergent species was confirmed by Edwards (2007), who found each diverged from one another about 1.5 MYA.

The western form from near Perth and found along the south-west coast of Western Australia to about Albany, Western Australia (including King George's Sound) is a frog with a mainly pinkish brown dorsum or alternatively has a distinct charcoal coloured hue in some southern populations and a generally whitish venter.

The second, morphologically divergent species, occurs along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay, and then extending inland towards the Darling

Range near the south-side of Perth in Western Australia. These frogs, are yellowish brown (usually to light chocolate brown, with a yellowish venter, which has extensive markings and spots overlaying tubercles, especially anteriorly.

The three available synonyms for *C. georgiana* were checked.

Pterophrynus affinis Günther, 1864, is depicted with his description and that specimen is clearly of the western form, similar in appearance to the female depicted on page 554, centre right of Anstis (2013). The two frogs described by Cope, namely *Crinia insignata* Cope, 1866 and *C. stolata* Cope, 1867, both conform to common colour variants of the western form, *C. insignata* probably coming from near Perth and *C. stolata* matching the form from Denmark, Western Australia.

As a result, there is no available name for the eastern form of the putative species and it is herein named *Crinia merceicai* sp. nov..

The genus *Geocrinia* Blake, 1973 is formally split into two with the second genus formally named for the first time as *Wellingtondella* gen. nov.. *Hesperocrinia* Wells and Wellington, 1985, type species: *Crinia leai* Fletcher, 1898 is resurrected as a subgenus within *Geocrinia*.

However the concept of the genus is not as conceived by Wells and Wellington (1985).

They treated the genus as including all West Australian species of *Geocrinia*.

However, based on the molecular data of Read *et al.* (2001), their type species is more closely associated with the eastern Australian *Geocrinia*, including the type species *Pterophrynus laevis* Günther, 1864, which is why their type species is placed back into that genus.

The species originally described as *Crinia leai* Fletcher, 1898 is in my view on the cusp of genus-level separation from *Geocrinia* again based on the molecular results of Read *et al.* (2001), so it is therefore treated as subgenus level separation and the name *Hesperocrinia* is retained and used.

Two new species within the subgenus *Hesperocrinia* and three new subspecies within *Geocrinia* are also formally named.

One subspecies is associated with *G. laevis* (Günther, 1864) and the other two with *G. victoriana* (Boulenger, 1888).

The putative species *Paracrinia haswelli* (Fletcher, 1894), monotypic for the genus *Paracrinia* Heyer and Liem, 1976, originally described as *Crinia haswelli* Fletcher, 1894, with a type locality of Jervis Bay, New South Wales, Australia is split into three well defined species on the basis of allopatry and morphological divergence, the two newly identified forms being formally named for the first time.

Prior to this study, no other herpetologists had

indicated likelihood of the putative taxon *Paracrinia haswelli* including more than one species. However ever since arriving in Melbourne to live in 1985, I soon had the opportunity to view specimens from the Mornington Peninsula and immediately had no doubt that they were a different taxon to those specimens of *Paracrinia haswelli* that I had seen both in Darkes Forest just south of Sydney, in New South Wales and others I had caught on the New South Wales south coast near Nowra.

The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nichollsi* Harrison, 1927, known only from south-west Western Australia, is split into three species, each being morphologically and genetically divergent.

Three genetically divergent populations in south-west Australia were identified by Edwards (2007).

Only the western, population, identified by here as the main population, has an available name, being type form for the species, with a type locality of Pemberton, Western Australia.

A second population from the south coast from Walpole in the west to Albany in the east is formally named as a new species as is another outlier population confined to the Stirling Range National Park north-east of this area.

Edwards (2007), gave various estimates for the divergences of each population, but at page 108 estimated the populations of the three clades (named herein as species) diverged from one another 2.6 to 3.4 million years before present. While recognizing each as distinct lineages, she did not formally name any.

Morphological and genetic divergence of each so-called lineage, made species level recognition the only logical step to take when reviewing the taxonomy of the group.

Uperoleia Gray, 1841 is divided into two genera, while a further two subgenera within remaining *Uperoleia* are recognized. One subgenus, *Quasiuperoleia* subgen. nov. is formally named for the first time, while available names, *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 (as a subgenus) are resurrected. A new species, *H. shuddafakup* sp. nov. is formally named within the genus *Hosmeria*. That was until now treated as a Queensland, or northern population of the well-known species *H. laevigata* (Keferstein, 1867), with a type locality of Randwick, in New South Wales, now an inner eastern suburb of Sydney, Australia, with centre of distribution of that taxon being New South Wales.

A second new species associated with *H. fusca* (Davies, McDonald and Corben, 1986), with a type locality of Eungella, Queensland, from New South Wales and south-east Queensland is formally named *H. shireensbogensis* sp. nov..

Four new species in subgenus *Uperoleia* are formally

named for the first time. Of these, three are derived from a formal split of putative *U. borealis* Tyler, Davies and Martin, 1981 into four regionally distinctive species. Besides morphological divergence, the molecular study of Catullo and Scott Keogh (2014) confirmed species-level divergences within the original putative taxon.

The species *U. crassa* Tyler, Davies and Martin, 1981 is also split two ways, based on the fact that the newly described population is morphologically divergent and found in a biogeographically separated part of the Kimberley district from the type locality of *U. crassa* at Mitchell Plateau.

A northern population of *U. micra* Doughty and Roberts, 2011 is also formally named as a new subspecies *U. micra divergens subsp. nov.*

Two new species, both until now treated as populations of *U. lithomoda* Tyler, Davies and Martin, 1981 within subgenus *Prohartia* are formally named for the first time. One of these in turn is divided into two, with a new subspecies formally named. Another subspecies within *Prohartia* is formally named, this being a distinctive and divergent southern population of *U. minima* Tyler, Davies and Martin, 1981, from the Kimberley district of Western Australia.

Also within *Prohartia* a new species is formally named from southern Papua New Guinea. This taxon has been assigned to the species *U. lithomoda* Tyler, Davies and Martin (1981) by Tyler and Davies (1984), and then re-assigned to the species *U. mimula* Davies, McDonald and Corben, 1986 by Davies (1987).

However the relevant type material from Morehead in Papua New Guinea conforms to neither species and so it is treated herein as a new species and formally named *U. gedyei sp. nov.* It is however most closely related to *U. mimula*. Furthermore putative *U. mimula* from Townsville Common in Queensland are morphologically divergent from specimens from the type locality at Lakefield Ranger Station, far north Queensland, including specimens from almost the entirety of the known range of that taxon and so it too is named as a new species.

At the present time, the new species *U. rossignolii sp. nov.* is not known from anywhere else.

The southern Barred River Frog, *Mixophyes hoserae* Hoser, 2020, occurs from the lower north and central coast of New South Wales, southwards, east of the Great Dividing Range into north-east Victoria.

Morphologically divergent specimens from the far south in this range, from north-east Victoria and immediately adjacent New South Wales are formally named herein as a new subspecies, namely, *M. hoserae jackyae subsp. nov.*

Myobatrachidae is also formally divided into four newly identified tribes in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are Myobatrachini, with subtribe Oxyphryneina subtribe. nov., Uperoleiaini tribe nov. including Spicospinaina subtribe nov., with nomimate subtribe defined and diagnosed by default from the other subtribe description, Wellingtondellaini tribe nov. with subtribe Paracriniaina subtribe nov. and Criniaini tribe nov..

Based on the published phylogenies of Catullo and Scott Keogh (2014) and Pyron and Weins (2011) each tribe is divergent from one another by 25 MYA or more and so these tribe designations are in fact very conservative. Subtribes defined for the three genus groups are believed to have diverged more than 20 MYA.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper.

This is in view of the conservation significance attached to the formal recognition of unnamed taxa at all levels and on the basis that further delays may in fact put these presently unnamed or potentially improperly assigned taxa at greater risk of extinction as outlined by Hoser (2019b, 2019c).

This comment is made noting the extensive increase in human population in Australia and New Guinea, with a conservative forecast of a four-fold increase in human population in the next 100 years (from 25 million to 100 million) in Australia and an even more dramatic increase in New Guinea (both sides) and the general environmental destruction across the continental region as documented by Hoser (1991), including low density areas without a large permanent human population.

I also note the abysmal environmental record of various Australian National, State and Local governments and quasi-government employees in the relevant part of the Australasian region over the past 200 years as detailed by Hoser (1989, 1991, 1993, 1996, 2019b and 2019c).

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

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

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

In terms of the following formal descriptions of genera, subgenera, species or subspecies, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the *International Commission of Zoological Nomenclature*.

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

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

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 10 September 2020, unless otherwise stated and were accurate in terms of the context cited herein as of that date.

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

A general reference to "colour" is unless otherwise stated, referring to the dorsal and obvious colouration of the frog on the usually visible surfaces and unless otherwise stated, not including hidden surfaces, not normally exposed by a frog in a resting position.

Unless otherwise stated, the following applies. Size measurements and ratios quoted herein are for normal adults of normal adult size. Where one number only is given, this is the average measurement. Where two numbers are given in the form of a range, this means "known range" based on previously measured and recorded specimens.

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

Each newly named tribe, subtribe, genus, subgenus, species or subspecies is readily and consistently separable from other similar taxon or group as indicated and that which until now the relevant newly named group or form have been treated as being within.

Delays in recognition of these unique taxa could jeopardise the long-term survival of these taxa as outlined by Hoser (2019b, 2019c) and sources cited therein.

Translocation of specimens may also cause problems as outlined in Hoser (1995).

Therefore attempts by taxonomic vandals like the Wolfgang Wüster gang via Kaiser (2012a, 2012b, 2013, 2014a, 2014b) and Kaiser *et al.* (2013) (as frequently amended) or Wüster (2020) to unlawfully suppress the recognition of these taxa on the basis

they have a personal dislike for the person who formally named it should be resisted (Cogger 2014, Dubois *et al.* 2019).

Claims by the Wüster gang against this paper and the descriptions herein will no doubt be no different to those the gang have made previously, all of which were discredited long ago as outlined by Cogger (2014), Dubois *et al.* (2019), Hoser, (2007, 2009, 2012a, 2012b, 2013, 2015a-f, 2019b, 2019c) and the many other sources cited therein.

CONSERVATION OF RELEVANT SPECIES AND GENERA

In terms of the conservation outlook for the relevant species and genera, the outlook is generally not good, as detailed in Hoser (1991, 2019b, 2019c), the comments being as relevant in 2020 as they were in 1991, if not more so.

With a few exceptions, most species of frogs are regarded as being in serious decline and at risk of extinction, with primary blame being placed on the Australian government.

In particular via the actions of the State wildlife departments and their steadfast refusal to enact proper captive breeding programs for the relevant taxa in any meaningful way, this means that many species face an inevitable path towards extinction, due to this direct action and other human caused threats.

The long term overpopulation of the Australia with feral humans (Saunders, 2019) does not auger well for the long term survival of many of the relevant species in Australia!

In line with the Australian Federal Government's "Big Australia" policy, that being to increase the human population of 25 million (2020), from 13 million in around 1970, to over 100 million within 100 years "so that we can tell China what to do", as stated by the former Prime Minister, Kevin Rudd in 2019 (Saunders 2019, Zaczek 2019), the human pressure on the relevant ecosystems has increased in line with the human populations nearby and will clearly continue to do so.

The conservation situation for frogs in New Guinea and offshore islands is even more dire than in Australia and again gives justification and urgency for the naming of hitherto unnamed species in the Australasian region.

According to the website <https://www.worldometers.info>

Papua New Guinea claimed a population of nearly 9 million people in 2020. This is up from just over 2 million in 1955, more than a 4 fold rise in 65 years. In that time Papua New Guinea has been converted from largely untouched jungle to mainly heavily cleared and or generally vandalized habitat, with an ever decreasing amount of native wildlife.

The pace of habitat destruction is getting faster, year on year.

The destruction on the Indonesian side of New Guinea is of similar scale, but at the moment coming from a lower population base.

In 1990 there were 385,509 people in the Indonesian province of Irian Jaya. This has nearly tripled in 30 years to be about 1 million in 2020. Transnational companies clearing land for agriculture and deforestation to satisfy insatiable global demand makes up for any lack of local people doing environmental damage just in their quest to stay alive and satisfy daily needs.

In any event, 1 million people in 2020 is likely to multiply to at least 4 million in 65 years and 16 million in 130 years and 72 million people in less than 200 years!

And this assumes no mass immigration from other even more overpopulated parts of the planet! All in a land area of just 126,093 square kilometres. The ecological disaster evolving on the island of New Guinea over just a few human life spans is a disaster of biblical proportions.

Even in 2020, in some areas near Port Moresby, Papua New Guinea, streams that 30 years ago were pristine and full of a diverse array of frogs are now nothing more than open sewers taking run off from the homes of increasing numbers of people living in third-world poverty and squalor.

Humans are literally an ecological plague in both Australia and New Guinea and the non-stop population explosion must be arrested with urgency. The globalisation of trade has also globalized the spread of pathogens that has already had devastating effects on amphibian populations worldwide including in particular in New South Wales and Queensland, Australia (Hoser 1991, Anstis 2013).

Some species within Australasian frog genera have gone from abundant and at "no extinction risk" to "rare" or "critically endangered" within two decades due to a deadly fungus and such calamities are more likely as the human impact increases.

Put simply, all other "conservation" efforts pale into insignificance when tallied against the benefits of simply stopping human population growth.

In the material that follows, there is generally no mention of conservation aspects relevant to the given species or genera, but all the preceding is invariably relevant.

BOGOPHRYNE GEN. NOV.

LSID:urn:lsid:zoobank.org:act:2EFDD999-93EF-4255-9F50-493821F84F02

Type species: *Bogophryne uterbog* sp. nov.

Diagnosis: Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera (*Kyarranus* Moore, 1958 and *Bogophryne* gen. nov.) by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude -29.28 South. Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Phyloria*.

The placement of the species *Phyloria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne* gen. nov..

Distribution: Ranges along the Queensland and New South Wales border, north of Latitude 29.28 South and south of the Brisbane River Valley.

Etymology: The new genus name refers to where these frogs are found and occupy, being areas of "bog" or saturated wet ground and that they are like a small toad, in that the suffix is "*phryne*".

Hence the name "*Bogophryne*".

Content: *Bogophryne uterbog* sp. nov. (type species); *B. duboisi* sp. nov.; *B. breonnataylorae* sp. nov.; *B. loveridgei* (Parker, 1940); *B. naomiosakaae* sp. nov.

BOGOPHRYNE UTERBOG SP. NOV.

LSIDurn:lsid:zoobank.org:act:4556A81B-70B5-48B4-BEBA-256C598EAC6E

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R133242 collected from the Eastern Border Ranges, New South Wales. Latitude -28.4 S., Longitude 153.1 E. This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R138936, R138938, R138939, R138942 and R138959 collected from the Eastern Border Ranges, New South Wales. Latitude -28.4 S., Longitude 153.1 E.

Diagnosis: Until now, all of *Bogophryne uterbog* sp. nov. (type species for the genus *Bogophryne* gen. nov.), *B. duboisi* sp. nov., *B. breonnataylorae* sp. nov., *B. loveridgei* (Parker, 1940) and *B. naomiosakaae* sp. nov. have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne* gen. nov. within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by the following unique suite of characters: A dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper

lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakaae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* sp. nov., but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb. The dorsum of *B. naomiosakaae* sp. nov. is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* sp. nov.. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of “McPherson Ranges, 3-4000 ft, south Queensland” is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog sp. nov.* and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog sp. nov.*. Darker markings on the mid and lower dorsum of the back in *B. uterbog sp. nov.* are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne gen. nov.* are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phalanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat “prickly” appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne gen. nov.* is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Phyloria*.

The placement of the species *Phyloria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from “McPherson Ranges, 3-4000 ft, south Queensland” is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for “*Phyloria loveridgei*”.

Distribution: *B. uterbog sp. nov.* is known only from the type locality within the Border Ranges of northern New South Wales.

Etymology: In Latin, *uter* is a verb meaning to use, enjoy, employ, exploit or experience. This species inhabits and uses “bog” habitat, meaning areas of wet and saturated ground. Hence the name “*uterbog*”.

BOGOPHRYNE DUBOISI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5E6EA417-38A5-4CB7-A949-8E2ED18CC6A6

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.131931, collected from near Urbenville, New South Wales, west McPherson Ranges, Latitude -28.4 S., Longitude 152.8 E. This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens, at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.131933, R.131934, R.131935, R.131937 and R.64869, all collected from near Urbenville, New South Wales, west McPherson Ranges, Latitude -28.4 S., Longitude 152.8 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field

trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are

always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae sp. nov.*, but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb. The dorsum of *B. naomiosakae sp. nov.* is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae sp. nov.*. Upper iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog sp. nov.* and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog sp. nov.*. Darker markings on the mid and lower dorsum of the back in *B. uterbog sp. nov.* are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Philoria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne gen. nov.* are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or

indistinct. Terminal phalanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat “prickly” appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne gen. nov.* is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Phyloria*.

The placement of the species *Phyloria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from “McPherson Ranges, 3-4000 ft, south Queensland” is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for “*Phyloria loveridgei*”.

Distribution: *B. duboisi sp. nov.* occurs from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range.

Etymology: Named in honour of Alain Dubois of Paris, France, a herpetologist specializing in frogs, for services to science via his steadfast support for the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) against unscientific incursions by the likes of Wolfgang Wüster and his gang of thieves (e.g. Dubois *et al.* 2019) as referred

to by Cogger (2014) and Hoser (2007, 2009a, 20012a-b, 2013 and 2015a-f).

BOGOPHRYNE BREONNATAYLORAE SP. NOV.
LSIDurn:lsid:zoobank.org:act:3187DA03-644C-4A41-ABB5-D5949C7A0502

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R165027, collected from Lamington National Park, Queensland, Australia, Latitude -28.200 S., Longitude 153.050 E. This government-owned facility allows access to its holdings.

Paratypes: Ten preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J17361, J17362, J17364, J17365, J17368, J17369, J17370, J17373, J17375 and J17384 all collected at Lamington National Park, Queensland, Australia, Latitude -28.200 S., Longitude 153.083 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus as follows: By having a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper lip is grey to brown and

unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakaae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* sp. nov., but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb.

The dorsum of *B. naomiosakaae* sp. nov. is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* sp. nov.. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog* sp. nov. and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog* sp. nov.. Darker markings on the mid and lower dorsum of the back in *B. uterbog* sp. nov. are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Philoria*.

The placement of the species *Philoria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for "Philoria loveridgei".

Distribution: *B. breonnataylorae sp. nov.* is presently only known from Lamington National Park in Queensland, Australia.

Etymology: The species is named in honour of Breonna Taylor, a 26-year-old African-American emergency medical technician, who was fatally shot by Louisville Metro Police Department (LMPD) officers Jonathan Mattingly, Brett Hankison, and Myles Cosgrove on 13 March 2020.

Three plainclothes LMPD officers executing a no-knock search warrant entered her apartment in Louisville, Kentucky. Gunfire was exchanged between Taylor's boyfriend Kenneth Walker and the officers. Walker said that he believed that the officers were intruders. The LMPD officers fired over twenty shots. Taylor was shot eight times.

The death of Breonna Taylor and the conduct of police after the fact to play down their role in the unjustified killing, has become a symbol of police corruption and oppression of weak and vulnerable people by police worldwide, including in the United States, poor, unarmed black people who are shot and killed with impunity, because the police can get away with it.

Unfortunately the name Breonna Taylor has for most people, absolutely no connection with the woman killed by police, but instead the corruption in the police and the wider movement to stop police unnecessarily killing weak and vulnerable people including black people in the USA.

It is hoped that the naming of a frog in honour of a victim of police corruption and misconduct, will draw people's attention to this long-running problem in modern societies and remain a reminder in future years.

BOGOPHRYNE NAOMIOSAKAAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:33D4ED05-A7FC-4696-A1ED-421A6A4C6486

Holotype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J17381 collected from Mount Warning in New South Wales, Australia, Latitude -28.4 S., Longitude 153.3 E. This government-owned facility allows access to its holdings.

Paratypes: Seven preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J17363, J17366, J17372, J17377, J17382, J17385 and J17387, as well as four preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.31695, R.78980, R.111208 and R.131932 all collected from Mount Warning in New South Wales, Australia, Latitude -28.4 S., Longitude 153.3 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Philoria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axilla of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper

lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakaae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* sp. nov., but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb.

The dorsum of *B. naomiosakaae* sp. nov. is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* sp. nov.. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog* sp. nov. and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog* sp. nov.. Darker markings on the mid and lower dorsum of the back in *B. uterbog* sp. nov. are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size. *Bogophryne gen. nov.* species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Philoria*.

The placement of the species *Philoria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for "Philoria loveridgei".

Distribution: *B. naomiosakaae sp. nov.* appears to be endemic to Mount Warning in New South Wales, Australia. Specimens previously treated as *P. loveridgei* Parker, 1940 from Nightcap National Park, including Peach Mountain were not inspected and may be one or other of *B. naomiosakaae sp. nov.*, *B. loveridgei* Parker, 1940, *B. uterbog sp. nov.* or perhaps an unnamed species.

Etymology: The new species is named in honour of Naomi Osaka, a well-known professional tennis player who won her first-round match at the USA Open Tennis Tournament in 2020 and wanted to ensure people didn't forget about Breonna Taylor. In the middle of the Covid-19 pandemic, she wore a black mask that had the name Breonna Taylor (shot dead by police) emblazoned across the mask to highlight the plight of vulnerable black people in the face of endemic police corruption.

She honoured Breonna Taylor before her first-round match against Misaki Doi, another victim Elijah McClain during her match against Camila Giorgi during the second round and yet another victim Ahmaud Arbery during her third-round match against Marta Kostyuk.

She progressed to win the Grand Final of the 2020 USA Open Tennis Tournament, also wearing masks to commemorate 7 victims of police killings in the USA at the start of each round.

I am not into the game of tennis, but have honoured Naomi Osaka with the species name in recognition of her use of her public position to highlight the extremely serious issue of endemic police corruption in many parts of the world, including the untold damage done to lives of innocent victims, including African Americans killed by coward police, preying on weak and vulnerable

SLOPPOPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:B903DA79-29AF-4297-A033-E27F68F16150

Type species: *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

Diagnosis: Until now (year 2020), the putative genera *Bufo* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013), should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynosoma* *australis* (*non* Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufo* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufo*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne gen. nov.*

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of

Pseudophryne. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne gen. nov.* is formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne gen. nov.* is formally erected to accommodate the newly described species *Crottyphryne crotalusei sp. nov.* and the closely related *Pseudophryne douglasi* Main, 1964, both from Western Australia.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne gen. nov.* is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne gen. nov.* is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:
1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters:

Inner and outer metatarsal tubercles are small to moderate and not shovel-shaped; inner toe has two phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs. Both species are from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Distribution: The monotypic genus is only known from ranges in the far north-west of South Australia.

Etymology: The new genus is named in honour of an eight year old as of 2020 (born August 2012) Great Dane dog, named Slopp. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years and it is appropriate his services to science be recognized. The "phryne", suffix reflects the Latin word for toad. The "o" joining the two parts is deliberate as otherwise speaking the name would be difficult for some people. Hence "*Sloppophryne*".

Content: *Sloppophryne robinsoni* (Donnellan, Mahony and Bertozzi, 2012) (monotypic).

CROTTYPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:C7D57988-4847-41F0-AA1F-A9695B0A52C1

Type species: *Crottyphryne crotalusei* sp. nov.

Diagnosis: Until now (year 2020), the putative genera *Bufonella* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynos(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufonella* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufonella*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne* gen. nov..

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of *Pseudophryne*. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne* gen. nov. is

formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne* gen. nov. is formally erected to accommodate the newly described species *Crottyphryne crotalusei* sp. nov. and the closely related *Pseudophryne douglasi* Main, 1964, (including one newly named subspecies), both from the Pilbara region in Western Australia including some hilly areas immediately south.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne* gen. nov. is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne* gen. nov. is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters: 1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or:

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are small to

moderate and not shovel-shaped; inner toe has two phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs. Both species are from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Distribution: The genus is only known from the Pilbara region of Western Australia, including hilly areas to the immediate south.

Etymology: The new genus *Crottyphryne gen. nov.* is named in honour of a deceased Great Dane / Rottweiler Cross named Crotalus (AKA Crotty), himself named after a North American genus of Pitviper, *Crotalus* Linnaeus, 1758, in recognition of nearly 13 years services in guarding our valuable wildlife breeding and research facility.

The “phryne”, suffix reflects the Latin word for toad. Hence “*Crottyphryne*”.

Content: *Crottyphryne crotalusei sp. nov.* (type species); *C. douglasi* (Main, 1964) (including one newly named subspecies, *C. douglasi oxyi subsp. nov.*).

OXYPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D7F270AB-5D65-4C41-9AA7-C2BB25DA8825

Type species: *Pseudophryne corroboree* Moore, 1953.

Diagnosis: Until now (year 2020), the putative genera *Bufo* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynosoma australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufo* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufo*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne gen. nov.*

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of *Pseudophryne*. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne gen. nov.* is formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne gen. nov.* is formally erected to accommodate the newly described species *Crottyphryne crotalusei sp. nov.* and the closely related *Pseudophryne douglasi* Main, 1964, both from Western Australia.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne gen. nov.* is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne gen. nov.* is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters:

Inner and outer metatarsal tubercles are small to moderate and not shovel-shaped; inner toe has two

phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs.

Distribution: Both species in the genus *Oxyphryne gen. nov.* are allopatric and from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Etymology: The new genus *Oxyphryne gen. nov.* is named in honour of a deceased Great Dane dog, named Oxyranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The "phryne", suffix reflects the Latin word for toad.

Oxyranus Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

Content: *Oxyphryne corroboree* (Moore, 1953) (type species); *O. pengillyi* (Wells and Wellington, 1985).

PSEUDOPHRYNE FITZINGER, 1843.

Type species: *Phrynisc(us) australis* (non Gray) Duméril and Bibron, 1841.

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: Eastern Australia.

Content: *Pseudophryne semimarmorata* Lucas (1892) (type species) (including subspecies); *P. covacevichae* Ingram and Corben (1994); *P. bibronii* Günther, 1858; *P. dendyi* Lucas, 1892 (including subspecies); *P. jasminegranti sp. nov.*; *P. major* Parker, 1940; *P. martinekae sp. nov.*; *P. scottgranti sp. nov.*; *P. wellingtoni sp. nov.*; *P. wellsii sp. nov.* (including subspecies).

BUFONELLA GIRARD, 1853.

Type species: *Bufoella crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835).

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: Eastern Australia.

Content: *Bufoella australis* (Gray, 1835) (type species); *B. coriacea* (Keferstein, 1868); *B. euanedwardsi sp. nov.*; *B. hoserae sp. nov.*; *B. raveni* (Ingram and Corben, 1994); *B. woolfi sp. nov.*

KANKANOPHRYNE HEYER AND LIEM, 1976.

Type species: *Pseudophryne occidentalis* Parker, 1940.

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: South-western Western Australia, Australia.

Content: *Kankanophryne occidentalis* (Parker, 1940) (type species); *K. guentheri* (Boulenger, 1882); *K. katrinahoserae sp. nov.*; *K. marcdorsei sp. nov.*; *K. maxinehoserhoserae sp. nov.*

CROTTYPHRYNE CROTALUSEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:37243D61-3C4E-4E96-A836-2C1288533980

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R125741 collected from 200 metres south-east of Python Pool, Western Australia, Australia, Latitude -21.3392 S., Longitude 117.2366 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R125741 collected from 200 metres south-east of Python Pool, Western Australia, Australia, Latitude -21.3392 S., Longitude 117.2366 E.

Diagnosis: Until now, *Crottyphryne crotalusei sp. nov.* was treated as a northern population of *C. douglasi* (Main, 1964). *C. crotalusei sp. nov.* is found north of the Fortescue River biogeographical barrier, whereas *C. douglasi* has a centre of distribution in

the Pilbara region south of the Fortescue River. Molecular results of Donnellan *et al.* (2012) confirm the species-level divergence of these two populations and it is in accordance with other hill dwelling taxa in the region, including monitors, pygopodids and elapids.

Examples include *Worrellisaurus acanthurus* (Boulenger, 1885) north of the Fortescue River and *W. dannybrowni* Hoser, 2018 (Hoser, 2018) south of the Fortescue River, *Pilbaravaranus pilbarensis* (Storr, 1980) north of the Fortescue River and *P. hamersleyensis* (Maryan *et al.* 2014) south of the Fortescue River, *Wellsopus elegans* (Kluge, 1974) to the south of the Fortescue River and *W. robwatsoni* Hoser, 2017 (Hoser, 2017) to the north of the Fortescue River, *Vermicella snelli* (Storr, 1967) to the south of the Fortescue River and *V. sloppi* Hoser, 2020 (Hoser, 2020d) to the north.

The taxon *C. douglasi oxyi subsp. nov.* from the Cape Range of Western Australia, while morphologically divergent and distributionally disjunct from the main Pilbara population of *C. douglasi* and speculated by Anstis (2013) to be a separate species, was shown by Donnellan *et al.* (2012) not to be particularly genetically divergent and is therefore conservatively described herein as a new subspecies.

Breeding isolation of the Cape Range population, means it will continue to evolve separately as a species and so by some definitions should already be treated as such.

The three preceding taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi* (Main, 1964) and *C. douglasi oxyi subsp. nov.* herein comprising the entirety of the genus *Crottyphryne gen. nov.* are separated from one another, by the following three suites of characters:

1/ The type form of *C. douglasi* is characterised by having numerous large raised white or generally white tipped tubercles on the flanks and upper surfaces of the limbs and similar prominent white spotting on the underside of the gular region as well as beneath the eye and posterior to it, where the white spots are prominent. The iris is a bright orange colour. The orange patch on the snout between and anterior to the eyes is prominent and extends in some form to the supraciliary (above eye) region. Upper surfaces of the fore and hind limbs are dark brown with orange interspaces, with the scattered white spots referred to previously. White spotting on upper and lower lips is prominent and obvious.

The dorsum has a somewhat mottled colouration being a combination of ill defined areas of brick red to orange alternating with dark brown, being generally of a dark purplish or reddish colouration.

At the rear of the dorsum is an area of orange that is more or less triangular in shape and posterior to the forelimbs on the dorsum is a medium-sized semi-

distinct orange blotch of roughly circular shape on either side of the midline on the upper body. Upper arms are mainly orange and feet are mainly purplish. The type form of *C. douglasi* (*C. douglasi douglasi*) is depicted in life on page 649, bottom photo in Anstis (2013) and page 77, at top of Tyler (1992).

2/ *C. douglasi oxyi subsp. nov.* has limited raised white tubercles on the posterior lower flanks, but these are not distinct or well defined. Anterior to the eye and in stark contrast to *C. douglasi* there are no white spots of any form. The dorsum is a generally clean and well-defined pattern of mainly dark brown broken by a series of large orange blotches of irregular shape, but invariably including a large triangle at the rear and two large patches at the front of the body, each occupying the area above the axilla of the arms, with each patch being separated by darker pigment near the mid-dorsal area.

While *C. douglasi* also have the large triangle at the rear of the body on the dorsum in some form, anteriorly, *C. douglasi oxyi subsp. nov.* is readily separated from that species by the fact that the orange blotches posterior to the arms on the upper flank and nearby dorsum are large, well-defined and prominent. Upper arms of *C. douglasi oxyi subsp. nov.* are mainly light grey or pinkish, versus mainly orange in *C. douglasi douglasi*. Feet of *C. douglasi oxyi subsp. nov.* are mainly pink.

C. douglasi oxyi subsp. nov. is depicted in life on page 649, top photo in Anstis (2013).

3/ *C. crotalusei sp. nov.* differs from both *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* by being mainly pinkish dorsally, rather than mainly a dark or dull dark purple. The orange patch at the rear of the dorsum is elongate, rather than in the shape of a triangle with the broad edge at the anterior side as seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.*. In the area posterior to the forelimbs on the dorsum, the orange patches seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* are reduced to be simply tiny spots, usually in the form of raised orange tubercles, or alternatively are absent. Tubercles on the body, including the lower flanks tend to be the same colour as the surrounding skin, or if lighter are usually pinkish, rather than white as seen in *C. douglasi douglasi*.

C. douglasi douglasi and *C. crotalusei sp. nov.* have obvious raised orange patches on the upper surfaces of the forearms, which are absent in *C. douglasi oxyi subsp. nov.*

C. crotalusei sp. nov. have pink feet with strong purple peppering, giving them a pinkish-purple hue, somewhat intermediate between that seen in *C. douglasi oxyi subsp. nov.* (mainly pink) and *C. douglasi douglasi* (mainly purple).

The dorsum of *C. crotalusei sp. nov.* is a combination of areas of pink and purple forming an irregular and indistinct pattering. Anterior the colour is mainly pink,

becoming mainly purple at the rear, excluding the light orange region at the centre of the posterior part of the back.

Both *C. douglasi oxyi subsp. nov.* and *C. douglasi douglasi* have obvious orange colour on the upper snout anterior to the eyes. This is not the case in *C. crotalusei sp. nov.*. The snout of *C. crotalusei sp. nov.* is greyish pink, heavily peppered with dull purple.

C. crotalusei sp. nov. is depicted in life on plate 27 at top (image one) of Tyler, Smith and Johnstone (1994).

Photos of all three taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi oxyi subsp. nov.* and *C. douglasi douglasi* can also be found on the website <http://www.flickr.com> by doing a search for "Pseudophryne douglasi".

Distribution: *Crottyphryne crotalusei sp. nov.* is known only from a limited area near the type locality, being north of the Fortescue River in the western part of the Pilbara Region. This area includes the Millstream Chichester National Park, including the region of the Upper Harding River.

Etymology: As for the genus *Crottyphryne gen. nov.*. The new species *C. crotalusei sp. nov.* is named in honour of a deceased Great Dane /Rottweiler Cross named Crotalus (AKA Crotty), himself named after a North American genus of Pitviper, *Crotalus* Linnaeus, 1758, in recognition of nearly 13 years services in guarding our valuable wildlife breeding and research facility. The addition of the letter "e" in the name (after the word "crotalus" and preceding the suffix "i") is deliberate and should not be removed.

CROTTYPHRYNE DOUGLASI OXYI SUBSP. NOV.
LSIDurn:lsid:zoobank.org:act:3DDDD5E6-52F9-4E77-B9F3-9AA2F85A25AC

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R104966 collected from 21 km north of Learmonth, Western Australia, Australia, Latitude -22.05 S., Longitude 114.0833 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R104967, R104968, R104969, R104970, collected from 21 km north of Learmonth, Western Australia, Australia, Latitude -22.05 S., Longitude 114.0833 E.

Diagnosis: Until now, *Crottyphryne crotalusei sp. nov.* was treated as a northern population of *C. douglasi* (Main, 1964). *C. crotalusei sp. nov.* is found north of the Fortescue River biogeographical barrier, whereas *C. douglasi* has a centre of distribution in the Pilbara region south of the Fortescue River. Molecular results of Donnellan *et al.* (2012) confirm the species-level divergence of these two populations and it is in accordance with other hill dwelling taxa in

the region, including monitors, pygopodids and elapids.

Examples include *Worrellisaurus acanthurus* (Boulenger, 1885) north of the Fortescue River and *W. dannybrowni* Hoser, 2018 (Hoser, 2018) south of the Fortescue River, *Pilbaravaranus pilbarensis* (Storr, 1980) north of the Fortescue River and *P. hamersleyensis* (Maryan *et al.* 2014) south of the Fortescue River, *Wellsopus elegans* (Kluge, 1974) to the south of the Fortescue River and *W. robwatsoni* Hoser, 2017 (Hoser, 2017) to the north of the Fortescue River, *Vermicella snelli* (Storr, 1967) to the south of the Fortescue River and *V. sloppi* Hoser, 2020 (Hoser, 2020d) to the north.

The taxon *C. douglasi oxyi subsp. nov.* from the Cape Range of Western Australia, while morphologically divergent and distributionally disjunct from the main Pilbara population of *C. douglasi* and speculated by Anstis (2013) to be a separate species, was shown by Donnellan *et al.* (2012) not to be particularly genetically divergent and is therefore conservatively described herein as a new subspecies.

Breeding isolation of the Cape Range population, means it will continue to evolve separately as a species and so by some definitions should already be treated as such.

The three preceding taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi* (Main, 1964) and *C. douglasi oxyi subsp. nov.* herein comprising the entirety of the genus *Crottyphryne gen. nov.* are separated from one another, by the following three suites of characters:

1/ The type form of *C. douglasi* is characterised by having numerous large raised white or generally white tipped tubercles on the flanks and upper surfaces of the limbs and similar prominent white spotting on the underside of the gular region as well as beneath the eye and posterior to it, where the white spots are prominent. The iris is a bright orange colour. The orange patch on the snout between and anterior to the eyes is prominent and extends in some form to the supraciliary (above eye) region. Upper surfaces of the fore and hind limbs are dark brown with orange interspaces, with the scattered white spots referred to previously. White spotting on upper and lower lips is prominent and obvious.

The dorsum has a somewhat mottled colouration being a combination of ill defined areas of brick red to orange alternating with dark brown, being generally of a dark purplish or reddish colouration.

At the rear of the dorsum is an area of orange that is more or less triangular in shape and posterior to the forelimbs on the dorsum is a medium-sized semi-distinct orange blotch of roughly circular shape on either side of the midline on the upper body. Upper arms are mainly orange and feet are mainly purplish.

The type form of *C. douglasi* (*C. douglasi douglasi*) is

depicted in life on page 649, bottom photo in Anstis (2013) and page 77, at top of Tyler (1992).

2/ *C. douglasi oxyi subsp. nov.* has limited raised white tubercles on the posterior lower flanks, but these are not distinct or well defined. Anterior to the eye and in stark contrast to *C. douglasi* there are no white spots of any form. The dorsum is a generally clean and well-defined pattern of mainly dark brown broken by a series of large orange blotches of irregular shape, but invariably including a large triangle at the rear and two large patches at the front of the body, each occupying the area above the axilla of the arms, with each patch being separated by darker pigment near the mid-dorsal area.

While *C. douglasi* also have the large triangle at the rear of the body on the dorsum in some form, anteriorly, *C. douglasi oxyi subsp. nov.* is readily separated from that species by the fact that the orange blotches posterior to the arms on the upper flank and nearby dorsum are large, well-defined and prominent. Upper arms of *C. douglasi oxyi subsp. nov.* are mainly light grey or pinkish, versus mainly orange in *C. douglasi douglasi*. Feet of *C. douglasi oxyi subsp. nov.* are mainly pink.

C. douglasi oxyi subsp. nov. is depicted in life on page 649, top photo in Anstis (2013).

3/ *C. crotalusei sp. nov.* differs from both *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* by being mainly pinkish dorsally, rather than mainly a dark or dull dark purple. The orange patch at the rear of the dorsum is elongate, rather than in the shape of a triangle with the broad edge at the anterior side as seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.*. In the area posterior to the forelimbs on the dorsum, the orange patches seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* are reduced to be simply tiny spots, usually in the form of raised orange tubercles, or alternatively are absent. Tubercles on the body, including the lower flanks tend to be the same colour as the surrounding skin, or if lighter are usually pinkish, rather than white as seen in *C. douglasi douglasi*.

C. douglasi douglasi and *C. crotalusei sp. nov.* have obvious raised orange patches on the upper surfaces of the forearms, which are absent in *C. douglasi oxyi subsp. nov.*

C. crotalusei sp. nov. have pink feet with strong purple peppering, giving them a pinkish-purple hue, somewhat intermediate between that seen in *C. douglasi oxyi subsp. nov.* (mainly pink) and *C. douglasi douglasi* (mainly purple).

The dorsum of *C. crotalusei sp. nov.* is a combination of areas of pink and purple forming an irregular and indistinct patterning. Anterior the colour is mainly pink, becoming mainly purple at the rear, excluding the light orange region at the centre of the posterior part of the back.

Both *C. douglasi oxyi subsp. nov.* and *C. douglasi*

douglasi have obvious orange colour on the upper snout anterior to the eyes. This is not the case in *C. crotalusei* sp. nov. The snout of *C. crotalusei* sp. nov. is greyish pink, heavily peppered with dull purple.

C. crotalusei sp. nov. is depicted in life on plate 27 at top (image one) of Tyler, Smith and Johnstone (1994).

Photos of all three taxa, *Crottyphryne crotalusei* sp. nov., *C. douglasi oxyi* subsp. nov. and *C. douglasi douglasi* can also be found on the website <http://www.flickr.com> by doing a search for "Pseudophryne douglasi".

Distribution: The newly described subspecies *C. douglasi oxyi* subsp. nov. is believed to be confined to the Cape Range of Western Australia. It is apparently separated from the main population of *C. douglasi douglasi* in the nearby Pilbara region by an apparently impenetrable barrier of generally sand dune habitat and/or flats.

Etymology: The new subspecies is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. *Oxyuranus* Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

KANKANOPHRYNE MAXINEHOSERAE SP. NOV.
LSIDurn:lsid:zoobank.org:act:C0B8F846-BF5D-4B82-94EB-A0C3D4E3065E

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number R113774 collected from 66 km north of Leonora, Western Australia, Australia, Latitude -28.2 S., Longitude 121.3333 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, specimen numbers R113775 and R113776 collected from 66 km north of Leonora, Western Australia, Australia, Latitude -28.2 S., Longitude 121.3333 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact

that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one another by the following unique suites of characters: 1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline.

Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K.*

occidentalis. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and *K. occidentalis*).

Upper iris a light yellowish-orange. Lower iris bright orange.

A live specimen of *K. maxinehoserae* sp. nov. is depicted in Cogger (2014) on page 107 (top, right) or online at:

<https://www.flickr.com/photos/toddburrows/6458477317/>

and

<https://www.flickr.com/photos/toddburrows/6458478511/>

4/ *K. katrinahoserae* sp. nov. is similar in most respects to *K. maxinehoserae* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoserae* sp. nov. is separated from *K. maxinehoserae* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can be found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the

following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoserae* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoserae* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne maxinehoserae* sp. nov. is known to occur in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

Etymology: Named in honour of Maxine Hoser of Margate, United Kingdom in recognition of her services to herpetology in my formative years in the 1960's.

KANKANOPHRYNE KATRINAHOSERAЕ SP. NOV.

LSIDurn:lsid:zoobank.org:act:01A8B3E9-CD27-497B-9701-89B83FD87688

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number R115171 collected from 5 km south west of Mount West, Western Australia, Australia, Latitude -26.3038 S., Longitude 128.7966 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, specimen numbers R115170 and R115172 collected from 5 km south west of Mount West, Western Australia, Australia, Latitude -26.3038 S., Longitude 128.7966 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one another by the following unique suites of characters:

1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline.

Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K.*

occidentalis. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and *K. occidentalis*).

Upper iris a light yellowish-orange. Lower iris bright orange.

4/ *K. katrinahoserae* sp. nov. is similar in most respects to *K. maxinehoserae* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoserae* sp. nov. is separated from *K. maxinehoserae* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoserae* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoserae* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne katrinahoserae* sp. nov. is known only from the type locality in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

Etymology: Named in honour of my mother, Katrina Hoser originally of Dagenham, Essex, United Kingdom, but for most of her life, Sydney, New South

Wales, Australia (mainly Lane Cove, North Shore), in recognition of her many contributions to herpetology and wildlife conservation worldwide.

KANKANOPHRYNE MARCDORSEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E082BC71-8D87-45CF-AB90-51B89B16FFDE

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R132638 collected from under some loose rocks in a soak at Koolanooka Spring, Western Australia, Australia, Latitude -29.1869 S., Longitude 116.6867 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R132639, R132640, R132641 and R132642 all collected from under some loose rocks in a soak at Koolanooka Spring, Western Australia, Australia, Latitude -29.1869 S., Longitude 116.6867 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one

another by the following unique suites of characters: 1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline. Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K. occidentalis*. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

K. marcdorsei sp. nov. is depicted in life online at: https://www.flickr.com/photos/zimny_anders/37199032955

and

https://www.flickr.com/photos/zimny_anders/37199035155/

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and

K. occidentalis).

Upper iris a light yellowish-orange. Lower iris bright orange.

4/ *K. katrinahoseræ* sp. nov. is similar in most respects to *K. maxinehoseræ* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoseræ* sp. nov. is separated from *K. maxinehoseræ* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoseræ* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoseræ* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne marcdorsei* sp. nov. is known only from hilly and otherwise elevated areas mainly north-east of Geraldton, Western Australia.

Etymology: Named in honour of Marc Dorse of Toowoomba, Queensland, Australia, previously of Mount Tamborine, Queensland, Australia, a wildlife demonstrator of some decades (Business name "Deadly Australians", Australian Registered Trademark number 797420, registered in 1999), in recognition of his services to education and wildlife conservation in Australia.

Dorse was the first person in the world to breed in captivity the little known freshwater turtle species *Wollumbinia purvisi* (Wells and Wellington, 1985). The more recent and widely posted claim by John Weigel and his privately owned zoo business, trading as the "Australian Reptile Park" to be the first in the world to breed this species (*Wollumbinia purvisi*) (e.g.

as posted at: <https://reptilepark.com.au/animals/reptiles/turtles-tortoises/manning-river-turtle/> is nothing more than a scam to entice well-meaning gullible people to donate money to his privately owned business masquerading as a charity. Trading on the plight of endangered wildlife by making false claims for personal profit, in order to scam cash from well-meaning but otherwise ill-informed people is ethically and morally repugnant!

BUFONELLA HOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:83D166B4-6E5B-4D8B-A991-2D12F7B39D59

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.155209, collected at Garrawarra Track, Royal National Park, New South Wales, Australia, Latitude -34.1750 S., Longitude 151.0442 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.155208 collected at Karloo Track, Royal National Park, at Heathcote, New South Wales, Australia, Latitude -34.0928 S., Longitude 151.0117 E.

2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.148292 collected at Lady Carrington Drive, Royal National Park, Latitude -34.116 S., Longitude 151.050 E.

Diagnosis: The molecular evidence of Donnellan *et al.* (2012) supports the contention that *Bombinator australis* Gray, 1835, better known as *Pseudophryne australis* (Gray, 1835) and associated species from eastern Australia form a genus-level clade sufficiently divergent from the type species of *Pseudophryne* Fitzinger, 1843, namely *Phrynis(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) and species most closely related to this taxon, to be placed in a separate genus.

The genus name *Bufonella* Girard, 1853, with the type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835), from the sandstone regions within a 250 km radius of Sydney, New South Wales, Australia is resurrected to include that species and other related forms from coastal eastern Australia and therefore that name (*Bufonella*) is used herein. Since at least the 1970's it has been common knowledge that putative *Bufonella australis* (Gray, 1835) varies significantly between the three main sandstone bioregions surrounding Sydney.

Those from the North Shore, Northern Beaches and north, through the escarpments of the central coast to the south side of the Hunter Valley have long been known to differ from those from south in the Royal National Park, Heathcote State Park and adjoining

areas.

Specimens from the Blue Mountains, are most similar to those from the south, but appear to be potentially distributionally disjunct from them in a zone equating to the south-western Cumberland Plain and the elevated country to the south-west.

The northern population is apparently separated from the Blue Mountains population in the region of the Grose River Valley, Colo River, or Putty Road intrusion.

Morphological differences and/or distributional trends in putative species along similar lines to those seen in putative *Bufo* *australis* are seen in other species, such as Death Adders *Acanthopis antarcticus* (Shaw and Nodder, 1802), which are readily identified by region of origin (North, south or Blue Mountains), simply by appearance, or Broad-headed Snakes *Hoplocephalus bungaroides* (Schlegel, 1837), found in the southern area, consisting of the Royal National Park and Blue Mountains south-west, west and north-west of Sydney, but not in the northern sandstone regions of the North Shore, Northern Beaches, Central Coast or south of the Hunter Valley.

Stauber (1999) found significant genetic and morphological differences between the main populations of putative *Bufo* *australis* and this was confirmed by the molecular study of Donnellan *et al.* (2012).

Two synonym names are also available for *B. australis* and so with the decision made to formally name the three main populations, the issue became which names could be assigned to known populations and which if any needed to be formally named.

Viewing the very aged type of *Bufo* *australis* (from photos provided) indicate that it is from somewhere between Sydney and Newcastle and therefore applies to the northern form. The published history relating to the obtaining of the original type specimen also confirms this.

Bufo *crucifera* Girard, 1853 is also clearly of the northern form based on Girard's original published description of what is self-evidently a faded preserved specimen.

He wrote:

"17. *BUFONELLA CRUCIFERA*, G. Deep brown above; back dotted with yellow; a yellow spot at the origin of the arms; a yellow band across the head, over the eyelid, sending off a medial branch to the snout; a yellow dorsal vitta on the posterior half of the body. Beneath blackish brown, with large yellowish maculae under the head, belly and leg. Tip of fingers and toes yellow. Head and body elongated; former depressed; latter subcylindrical. First finger shorter than the second. Toes free. Metatarsal tubercles indistinct."

I draw attention to the words "back dotted with

yellow", the yellow being the orange colour seen in life, the dotting being a trait associated with the northern form.

The specimen of *Phrynosoma albifrons* Duméril, Bibron, and Duméril, 1854, (Erp. Gen., 9: plate 100 and p. 413) is also of the northern form.

This can be seen by the configuration of red on the back of the specimen in the illustration, being a configuration unique to the northern form.

On the basis of the preceding, it is the southern form and Blue Mountains form which are hitherto unnamed and herein formally described and named for the first time.

The three relevant taxa are separated from one another as follows:

1/ *B. australis* is readily separated from the other two taxa by having large prominent orange-red spots or larger markings all over the back, including the anterior region.

Little if any red is on the upper surface of the lower part of the forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband without any orange. The dorsum is generally dark and gun-metal greyish. The distinctive orange-red markings are strongly contrasting. Anterior and posterior to the eye is dark and the region between the jawline and the eye is nearly as dark.

The nominate form of *B. australis* is depicted on page 31 (top) of Hoser (1989) and Cogger (2014) on page 102 (bottom).

2/ *B. hoseri* *sp. nov.* is the species from the Royal National Park, Heathcote State Park and nearby areas, being the so-called southern form. It is readily separated from *B. australis* and the subspecies *B. hoseri* *sadleri* *subsp. nov.* by having a mainly greyish-black back, with scattered black welts, sometimes tipped with tiny orange spots. Some specimens may have a broken orange medial line. There is rarely, if ever, any red on the lower forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a flush of orange on the distal side. The dorsum is generally greyish and any orange-red markings are not strongly contrasting, with the exception of any on the mid-dorsal line. Anterior and posterior to the eye is dark at the level of the top two thirds of the eye and the region between the jawline and the eye is much lighter, the boundary between the dark and light, being well defined and obvious.

3/ The subspecies *B. hoseri* *sadleri* *subsp. nov.* from the Blue Mountains region is most easily separated from the other two taxa by having a large amount of orange on the upper surfaces of the limbs. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a prominent well-defined orange spot at the distal side. The back is generally a light grey with a strong

reddish-orange tinge throughout and the raised tubercles are a dull, rather than bright orange colour.

B. australis sometimes has red on the upper surfaces of the hind limbs, but this is always strictly restricted to the tubercles, which may be moderate in size.

B. hoserae sp. nov. sometimes has a small number of tiny red tubercles on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has both red tubercles (in this case, best defined as dull orange in colour as a means to differentiate it from *B. australis*) and brown markings or peppering on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has a light coloured upper lip and adjoining labial region, including the side of the snout anterior to the eye.

B. hoserae sp. nov. and *B. hoserae sadlieri* subsp. nov. both have a mid-flank noticeably lighter than the dorsum, versus not so in *B. australis*.

Numerous photos of all three taxa *B. australis*, *B. hoserae* sp. nov. and *B. hoserae sadlieri* subsp. nov. can be found at <http://www.flickr.com> by doing a search for "*Pseudophryne australis*".

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. hoserae* sp. nov. occurs in the Royal National Park, Heathcote State Park and nearby areas of sandstone escarpment, generally south of the urbanized parts of the city of Sydney, New South Wales, Australia.

Etymology: This species is named in honour of my magnificent wife, Shireen Hoser, in recognition of more than 20 years of valuable contributions to herpetology in Australia and elsewhere.

BUFONELLA HOSERAE SADLIERI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:00623CCA-FB98-4970-AFFC-4C67090FBC7F

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.144613 collected at Valley Heights, lower Blue Mountains, New South Wales, Australia, Latitude -33.700 S., Longitude 150.583 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.149230, R.149231 and R.149232 collected from Tallwood Garden, Blaxland, New South Wales, Australia, Latitude -33.750 S., Longitude 150.616 E.

Diagnosis: The molecular evidence of Donnellan *et al.* (2012) supports the contention that *Bombinator australis* Gray, 1835, better known as *Pseudophryne australis* (Gray, 1835) and associated species from eastern Australia form a genus-level clade sufficiently divergent from the type species of *Pseudophryne* Fitzinger, 1843, namely *Phrynisc(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) and species most closely related to this taxon, to be placed in a separate genus.

The genus name *Bufo* Girard, 1853, with the type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835), from the sandstone regions within a 250 km radius of Sydney, New South Wales, Australia is resurrected to include that species and other related forms from coastal eastern Australia and therefore that name (*Bufo*) is used herein. Since at least the 1970's it has been common knowledge that putative *Bufo australis* (Gray, 1835) varies significantly between the three main sandstone bioregions surrounding Sydney.

Those from the North Shore, Northern Beaches and north, through the escarpments of the central coast to the south side of the Hunter Valley have long been known to differ from those from south in the Royal National Park, Heathcote State Park and adjoining areas.

Specimens from the Blue Mountains, are most similar to those from the south, but appear to be potentially distributionally disjunct from them in a zone equating to the south-western Cumberland Plain and the elevated country to the south-west.

The northern population is apparently separated from the Blue Mountains population in the region of the Grose River Valley, Colo River, or Putty Road intrusion.

Morphological differences and/or distributional trends in putative species along similar lines to those seen in putative *Bufo australis* are seen in other species, such as Death Adders *Acanthopis antarcticus* (Shaw and Nodder, 1802), which are readily identified by region of origin (North, south or Blue Mountains), simply by appearance, or Broad-headed Snakes *Hoplocephalus bungaroides* (Schlegel, 1837), found in the southern area, consisting of the Royal National Park and Blue Mountains south-west, west and north-west of Sydney, but not in the northern sandstone regions of the North Shore, Northern Beaches, Central Coast or south of the Hunter Valley.

Stauber (1999) found significant genetic and morphological differences between the main populations of putative *Bufo australis* and this was confirmed by the molecular study of Donnellan *et al.* (2012).

Two synonym names are also available for *B. australis* and so with the decision made to formally name the three main populations, the issue became which names could be assigned to known populations and which if any needed to be formally named.

Viewing the very aged type of *Bufo australis* (from photos provided) indicate that it is from somewhere between Sydney and Newcastle and therefore applies to the northern form. The published history relating to the obtaining of the original type specimen also confirms this.

Bufo crucifera Girard, 1853 is also clearly of the northern form based on Girard's original published description of what is self-evidently a faded preserved specimen.

He wrote:

"17. *BUFONELLA CRUCIFERA*, G. Deep brown above; back dotted with yellow; a yellow spot at the origin of the arms; a yellow band across the head, over the eyelid, sending off a medial branch to the snout; a yellow dorsal vitta on the posterior half of the body. Beneath blackish brown, with large yellowish maculae under the head, belly and leg. Tip of fingers and toes yellow. Head and body elongated; former depressed; latter subcylindrical. First finger shorter than the second. Toes free. Metatarsal tubercles indistinct."

I draw attention to the words "back dotted with yellow", the yellow being the orange colour seen in life, the dotting being a trait associated with the northern form.

The specimen of *Phrynosoma albifrons* Duméril, Bibron, and Duméril, 1854, (Erp. Gen., 9: plate 100 and p. 413) is also of the northern form.

This can be seen by the configuration of red on the back of the specimen in the illustration, being a configuration unique to the northern form.

On the basis of the preceding, it is the southern form and Blue Mountains form which are hitherto unnamed and herein formally described and named for the first time.

The three relevant taxa are separated from one another as follows:

1/ *B. australis* is readily separated from the other two taxa by having large prominent orange-red spots or larger markings all over the back, including the anterior region.

Little if any red is on the upper surface of the lower part of the forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband without any orange. The dorsum is

generally dark and gun-metal greyish. The distinctive orange-red markings are strongly contrasting. Anterior and posterior to the eye is dark and the region between the jawline and the eye is nearly as dark.

The nominate form of *B. australis* is depicted on page 31 (top) of Hoser (1989) and Cogger (2014) on page 102 (bottom).

2/ *B. hoserae sp. nov.* is the species from the Royal National Park, Heathcote State Park and nearby areas, being the so-called southern form. It is readily separated from *B. australis* and the subspecies *B. hoserae sadlieri subsp. nov.* by having a mainly greyish-black back, with scattered black welts, sometimes tipped with tiny orange spots. Some specimens may have a broken orange medial line. There is rarely, if ever, any red on the lower forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a flush of orange on the distal side. The dorsum is generally greyish and any orange-red markings are not strongly contrasting, with the exception of any on the mid-dorsal line. Anterior and posterior to the eye is dark at the level of the top two thirds of the eye and the region between the jawline and the eye is much lighter, the boundary between the dark and light, being well defined and obvious.

3/ The subspecies *B. hoserae sadlieri subsp. nov.* from the Blue Mountains region is most easily separated from the other two taxa by having a large amount of orange on the upper surfaces of the limbs. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a prominent well-defined orange spot at the distal side. The back is generally a light grey with a strong reddish-orange tinge throughout and the raised tubercles are a dull, rather than bright orange colour.

B. australis sometimes has red on the upper surfaces of the hind limbs, but this is always strictly restricted to the tubercles, which may be moderate in size.

B. hoserae sp. nov. sometimes has a small number of tiny red tubercles on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has both red tubercles (in this case, best defined as dull orange in colour as a means to differentiate it from *B. australis*) and brown markings or peppering on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has a light coloured upper lip and adjoining labial region, including the side of the snout anterior to the eye.

B. hoserae sp. nov. and *B. hoserae sadlieri subsp. nov.* both have a mid-flank noticeably lighter than the dorsum, versus not so in *B. australis*.

Numerous photos of all three taxa *B. australis*, *B. hoserae sp. nov.* and *B. hoserae sadlieri subsp. nov.* can be found at <http://www.flickr.com> by doing a

search for "*Pseudophryne australis*".

The genus *Bufonella* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* *gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. hoserae sadlieri* *sp. nov.* occurs in the sandstone escarpment country of the Blue Mountains in New South Wales, apparently bounded by the region of the Grose and Colo rivers and the Putty Road intrusion in the north-west and the Cumberland Plain in the south-west.

Etymology: The subspecies *B. hoserae sadlieri* *sp. nov.* is named in honour of Ross Sadlier of Sydney, New South Wales, who provided invaluable services to herpetologists over many years as collection manager at the Australian Museum in Sydney and also in recognition of his many other valuable contributions to herpetology globally, including in particular his extensive works on New Caledonian reptiles and more recently with John Cann (of La Perouse, New South Wales), doing important works on Australasian freshwater turtles (AKA terrapins).

BUFONELLA WOOLFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:26CD52D2-C2E6-4B77-B77B-B49BCBCEF23A

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184192 collected from End Gap Creek Road, in the Watagan National Park, New South Wales, Australia, Latitude -33.0133 S., Longitude 151.4306 E. This government-owned facility allows access to its holdings.

Paratypes: 13 preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.184189, R.184190, R.184194, R.184195, R.184196, R.184197, R.184198, R.184199, R.184200, R.184201, R.184221, R.184913 and R.184915 all collected from near End Gap Creek Road, in the Watagan National Park, New South Wales, Australia, Latitude -33.0133 S., Longitude 151.4306 E.

Diagnosis: *Bufonella woolfi* *sp. nov.* from the Watagan ranges south of the Hunter River in New South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes and *B. euanedwardsi* *sp. nov.* from far south-east

Queensland, north or west of the Scenic Rim, have both until now been treated as putative *B. coriacea* Keferstein, 1868 with a type locality of Clarence River (Northern) New South Wales, and treated here as extending from north of Newcastle, New South Wales along the coast and nearby ranges to the McPherson Ranges on the Queensland and New South Wales border.

The three species are readily separated from one another as follows:

B. coriacea has a dark charcoal black colour on the flanks, with the lower flank becoming a light grey. By contrast the entire flank is jet black in *B. woolfi* *sp. nov.*. The flank is dark blackish brown in *B. euanedwardsi* *sp. nov.*.

If present, any orange patches on the sides of the body of *B. woolfi* *sp. nov.* are well defined, sometimes being all or partially bounded by white, versus ill defined in both *B. coriacea* and *B. euanedwardsi* *sp. nov.*.

The dorsum of *B. coriacea* is reddish-brown with a large number of medium sized dark brownish black spots and blotches scattered across most parts of the dorsum. *B. woolfi* *sp. nov.* has few if any such spots or blotches and if present, they are invariably very small.

B. euanedwardsi *sp. nov.* has an orange-red or brownish back, punctuated with a series of carbuncles or ridges on the dorsum away from the mid-dorsal line. These raised areas are a dull brownish colour with ill defined boundaries in terms of color fading into that of the otherwise orange-red or brownish dorsum.

In *B. euanedwardsi* *sp. nov.* the numerous tiny tubercles on the upper body are similarly a dull brownish colour (not being white tipped at all), giving the appearance of numerous tiny brown spots on the upper surface of the body. In *B. coriacea* these tubercles are tipped in various colours in a single specimen, while in *B. woolfi* *sp. nov.* the tiny tubercles are all white tipped, giving the frog an appearance of being covered in tiny white specks.

The upper-lip area of the snout anterior to the eye, is almost entirely black in *B. woolfi* *sp. nov.*, heavily peppered charcoal in *B. coriacea* and brown in *B. euanedwardsi* *sp. nov.*.

On the upper surface of the upper arm, *B. woolfi* *sp. nov.* has well defined areas of white near the axilla and dark reddish orange distally, *B. coriacea* has a tiny amount of white near the axilla and brownish orange distally, while *B. euanedwardsi* *sp. nov.* has yellow near the axilla and an ill defined area of dull orange-brown distally.

B. woolfi *sp. nov.* is further separated from the other two species by having prominent, tiny white tipped tubercles on the upper surfaces of the dark coloured lower forearm, giving the appearance of tiny, white spots.

All three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. are readily separated from all other species of *Bufo* Girard, 1853 by lacking a bright red or orange triangular patch on the crown (*B. australis* (Gray, 1835), *B. hoserae* sp. nov. including one subspecies) and having generally dark flanks, versus one that has a thick black line at the upper part and light grey below as seen in *B. raveni* (Ingram and Corben, 1994).

Photos of all three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. can be found online at <http://www.flickr.com> by typing in the search term "Pseudophryne coriacea".

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *Bufo woolfi* sp. nov. is only known from the Watagan ranges south of the Hunter River in New South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes.

Etymology: *Bufo woolfi* sp. nov. is named in honour of Paul Woolf of Walloon in Queensland, Australia, foundation president of the Herpetological Society of Queensland, in recognition of many largely unrecognized contributions to herpetology in Australia over a time frame exceeding three decades.

BUFONELLA EUANEDWARDSI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:839F7291-C5BD-4DDB-97E2-7EEF6180984C

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R33655, collected from 23 km east of Emu Vale, south-east Queensland, Australia, Latitude -28.20 S., Longitude 152.47 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R33653, R33654 and R33656, all collected from 23 km east of Emu Vale, south-east Queensland, Australia, Latitude -28.20 S., Longitude 152.47 E.

Diagnosis: *Bufo woolfi* sp. nov. from the Watagan ranges south of the Hunter River in New

South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes and *B. euanedwardsi* sp. nov. from far south-east Queensland, north or west of the Scenic Rim, have both until now been treated as putative *B. coriacea* Keferstein, 1868 with a type locality of Clarence River (Northern) New South Wales, and treated here as extending from north of Newcastle, New South Wales along the coast and nearby ranges to the McPherson Ranges on the Queensland and New South Wales border.

The three species are readily separated from one another as follows:

B. coriacea has a dark charcoal black colour on the flanks, with the lower flank becoming a light grey. By contrast the entire flank is jet black in *B. woolfi* sp. nov.. The flank is dark blackish brown in *B. euanedwardsi* sp. nov..

If present, any orange patches on the sides of the body of *B. woolfi* sp. nov. are well defined, sometimes being all or partially bounded by white, versus ill defined in both *B. coriacea* and *B. euanedwardsi* sp. nov..

The dorsum of *B. coriacea* is reddish-brown with a large number of medium sized dark brownish black spots and blotches scattered across most parts of the dorsum. *B. woolfi* sp. nov. has few if any such spots or blotches and if present, they are invariably very small.

B. euanedwardsi sp. nov. has an orange-red or brownish back, punctuated with a series of carbuncles or ridges on the dorsum away from the mid-dorsal line. These raised areas are a dull brownish colour with ill defined boundaries in terms of color fading into that of the otherwise orange-red or brownish dorsum.

In *B. euanedwardsi* sp. nov. the numerous tiny tubercles on the upper body are similarly a dull brownish colour (not being white tipped at all), giving the appearance of numerous tiny brown spots on the upper surface of the body. In *B. coriacea* these tubercles are tipped in various colours in a single specimen, while in *B. woolfi* sp. nov. the tiny tubercles are all white tipped, giving the frog an appearance of being covered in tiny white specks.

The upper-lip area of the snout anterior to the eye, is almost entirely black in *B. woolfi* sp. nov., heavily peppered charcoal in *B. coriacea* and brown in *B. euanedwardsi* sp. nov..

On the upper surface of the upper arm, *B. woolfi* sp. nov. has well defined areas of white near the axilla and dark reddish orange distally, *B. coriacea* has a tiny amount of white near the axilla and brownish orange distally, while *B. euanedwardsi* sp. nov. has yellow near the axilla and an ill defined area of dull orange-brown distally.

B. woolfi sp. nov. is further separated from the other two species by having prominent, tiny white tipped

tubercles on the upper surfaces of the dark coloured lower forearm, giving the appearance of tiny, white spots.

All three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. are readily separated from all other species of *Bufo* Girard, 1853 by lacking a bright red or orange triangular patch on the crown (*B. australis* (Gray, 1835), *B. hoserae* sp. nov. including one subspecies) and having generally dark flanks, versus one that has a thick black line at the upper part and light grey below as seen in *B. raveni* (Ingram and Corben, 1994).

Photos of all three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. can be found online at <http://www.flickr.com> by typing in the search term "Pseudophryne coriacea".

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. euanedwardsi* sp. nov. is currently only known from far south-east Queensland, Australia, north or west of the Scenic Rim.

Etymology: The species *B. euanedwardsi* sp. nov. is named in honour of Euan Edwards, who in year 2020 is a licensed wildlife demonstrator based on the Gold Coast, Queensland, Australia in appreciation of his largely unrecognized significant contributions to herpetology globally, spanning more than 30 years.

PSEUDOPHRYNE SCOTTGRANTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:A2C19FB5-8375-47DA-81F0-53FEF3292035

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39881 collected from 2.5 km west of Kelly Hill Caves, Kangaroo Island, South Australia, Australia, Latitude -35.98 S., Longitude 136.85 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R11690 collected from 17 miles west of Parndana, Kangaroo Island, South Australia, Australia, Latitude -35.80 S., Longitude 136.97 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:
<https://www.flickr.com/photos/hierofalco/49910594073/>

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at: <https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axilla of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni subsp. nov.*), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. scottgranti sp. nov.* is known only from Kangaroo Island in South Australia, where it appears to be common.

Etymology: *P. scottgranti sp. nov.* is named in honour of Scott Grant, owner of the Eyre Reptile and Wildlife Park, Lincoln Hwy, Whyalla, South Australia, Australia, formerly of Victoria, Australia in recognition of his services to wildlife conservation and education in Australia.

Scott Grant, along with wife Jasmine Grant operates his tourist attraction in a business space dominated by dysfunctional government-owned and government-backed zoos who operate in a ruthless manner to hobble and disable those businesses they see as competing against them. Scandalously, these government-backed businesses masquerade as wildlife charities to scam money from well-meaning members of the public, often including deceased estates and other large bequeathments, with most of these funds actually being diverted away from wildlife conservation purposes.

By using excessive corrupt over-regulation by the wildlife authority departments they control, the government backed zoo businesses, make running any successful form of wildlife education or conservation business, including that of Scott and Jasmine Grant, in an ethical way near impossible in Australia.

PSEUDOPHRYNE JASMINEGRANTI SP. NOV.

LSIDurn: [lsid:zoobank.org:act:E1AD47B3-FD15-4B21-A6E2-FD1B08A26DC6](https://zoobank.org/act:E1AD47B3-FD15-4B21-A6E2-FD1B08A26DC6)

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39894, collected from Mookra Tower, northern Flinders Ranges, South Australia, Australia, Latitude -32.38 S., Longitude 138.40 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R39892 and R39893, collected from Mookra Tower, northern Flinders Ranges, South Australia, Australia, Latitude -32.38 S., Longitude 138.40 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti sp. nov.* from Kangaroo Island in South Australia and *P. jasminegrantae sp. nov.* from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti sp. nov.*; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti sp. nov.* and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely

spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegranta* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegranta* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov.

which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegranta* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegranta sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegranta* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded

tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump.

Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A

bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at: <https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of

snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at: <https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is

separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. jasminegrantae* sp. nov. occurs from the the Adelaide Hills in the south, north to include most of the Flinders Ranges in South Australia.

Etymology: *P. jasminegrantae* sp. nov. is named in honour of Jasmine Grant, wife of Scott Grant, the owner of the Eyre Reptile and Wildlife Park, Lincoln Hwy, Whyalla, South Australia, Australia, formerly of Victoria, Australia in recognition of her appreciated services to wildlife conservation and education in Australia.

***PSEUDOPHRYNE MARTINEKAE* SP. NOV.**

LSIDurn:lsid:zoobank.org:act:D6E3EF26-48FD-4BB8-AE80-14A226A1B600

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R45983, collected from 2.8 km west south-west of the Duck Island Homestead, South Australia, Australia, Latitude -36.2453 S., Longitude 140.0908 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R27772 and R27773, collected from the Gum Lagoon Conservation Park, South Australia, Australia, Latitude -36.30 S., Longitude 140.08 E. This government-owned facility allows access to its holdings.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibroni* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large

and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov.

which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered

with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks. While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi subsp. nov.* is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-

brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi sp. nov.* in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. martinekae* sp. nov. occurs in the sandy swamp areas of south-east South Australia and nearby parts of north-west and northern Victoria, through areas such as Bendigo and into south-west New South Wales, mainly on the western slopes and as far north as about Dubbo in central western New South Wales.

Etymology: *P. martinekae* sp. nov. is named in honour of Maryann Martinek of Bendigo, Victoria,

Australia for services to crime investigation and wildlife conservation in Australia as detailed by Hoser (2010).

PSEUDOPHRYNE WELLSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:42371255-3C1E-4E04-A421-B8B28FBC61D1

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.158010 collected from Robinsons Crossing, North of Hawks Nest, Myall Lakes National Park, New South Wales, Australia, Latitude -32.6036 S., Longitude 152.2339 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ Two preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.158011 and R.158012 collected from Robinsons Crossing, North of Hawks Nest, Myall Lakes National Park, New South Wales, Australia, Latitude -32.6036 S., Longitude 152.2339 E. 2/ Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.184183, R.184184 and R.184395 all collected from Napiac, New South Wales, Australia, Latitude -32.1487 S., Longitude 152.4108 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of

upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region

between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an

obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange.

Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a

longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi sp. nov.*. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni (P. wellingtoni wellingtoni subsp. nov.)*, but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellsi sp. nov.* is found in and around

coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour in New South Wales, Australia.

Etymology: *P. wellsi sp. nov.* is named in honour of Richard W. Wells of Lismore, New South Wales, Australia, formerly of Cowra, New South Wales and previous to that Sydney, New South Wales, in recognition of his immense services to herpetology in Australia. While best known for his landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published. Over many years he donated many thousands of valuable reptile specimens to the Australian Museum in Sydney, Australia, those specimens having been lynchpins of countless herpetological studies in the last 4 decades.

PSEUDOPHRYNE WELLINGTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:7A5D6A2D-1FA5-4BB4-A546-7FEC9AF42015

Holotype: A preserved specimen at the American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen number AMNH 65160 collected at an elevation of about 1,364 m from Ben Lomond in New South Wales, Australia, Latitude 30.0210 S., Longitude 151.659° E. This facility allows access to its holdings.

Paratypes: 1/ Six preserved specimens at American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen numbers AMNH 65161-65166 from the same location as the holotype. 2/ Five preserved specimens at American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen numbers AMNH 65155-65159 collected from Booroolong Creek, 20 miles northwest of Armidale, New South Wales, Australia, Latitude 30.285 S., Longitude 151.556 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus

heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a

unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-

brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey.

Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>
and

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish

white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>
and

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellingtoni* sp. nov. is found in the New England tablelands region of northern New South Wales, Australia and believed to occur in hilly regions to the immediate west.

Etymology: *P. wellingtoni* sp. nov. is named in honour of Cliff Ross Wellington of Ramornie, New South Wales, Australia, (about 485 km north of Sydney), previously of Woy Woy, New South Wales, Australia in recognition of his immense services to herpetology in Australia. While best known for his co-authorship of landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published, including numerous other important published works and services to conservation.

They include his petitioning the ICZN to stamp out the nefarious and dishonest practice of taxonomic vandalism and numerous conservation programs for rare and threatened species in New South Wales, especially in relation to frogs.

Wellington was also the first herpetologist in the world to demonstrate the significance of toxic chemicals in waterways inhibiting the spread of Chytrid fungus and thereby inadvertently helping vulnerable species of frogs evade extinction caused by the same fungus. This included several species from the Sydney and Blue Mountains regions of New South Wales.

PSEUDOPHRYNE WELLINGTONI KAPUTARENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:830305AB-97EE-459C-8D39-658B7501E8B4

Holotype: A preserved male specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184786 collected from Mount Kaputar National Park, New South Wales, Australia, Latitude -30.2825 S., Longitude 150.1715 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.112846, R184636 and R.184787 (a male), all collected from Mount Kaputar National Park, NSW, Australia, with an approximate Latitude -30.2825 S., Long. 150.1715 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axila, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>
and

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellingtoni kaputarensis* sp. nov. is presently only known from the Mount Kaputar National Park in northern (inland) New South Wales. Though range restricted, it is not believed to be under any existential threat and all specimens found to date have been within a National Park.

Etymology: The subspecies *P. wellingtoni kaputarensis* sp. nov. is named in reflection of where it comes from, being Mount Kaputar National Park or Kaputar as it is often referred to.

PSEUDOPHYRNE DENDYI MENSFORTHI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:3A7011B4-EE41-460B-8E25-F5537E2985D0

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R40871 collected from 32km North of the Abercrombie River, on the Oberon/Taralga Road, New South Wales, Australia. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.68462, R.68463, R.68464 and R.68465 all collected 6.4 km north of Shooters Hill on the Oberon Road, New South Wales, Australia, Lat. -33.866 S., Long. 149.866 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axilla of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axilla of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. dendyi mensforthi* subsp. nov. until now treated as putative *P. bibronii*, occurs in high elevation areas north of the alpine areas of Victoria and New South Wales as far north as at least Lithgow in New South Wales (see Hoser, 1989 at page 31), generally west of the coastal strip and east of the lower western slopes.

Etymology: *P. dendyi mensforthi* subsp. nov. is named in honour of Tim Mensforth of Ultimate Reptile Suppliers, Burton (Adelaide), South Australia, Australia, for services to herpetology over many decades, including through captive breeding of large numbers of sought after reptiles for the Australian pet trade, thereby reducing collecting pressure on wild animals.

His business Ultimate Reptile Suppliers, better known as URS has pioneered the commercialization and mass sale of important aids for reptile keepers, thereby improving welfare of captive animals and thereby improving the collective efforts of many otherwise disconnected people in breeding and conserving the relevant species including at times for re-release into the wild of severely depleted populations.

PSEUDOPHRYNE SEMIMARMORATA BURRELLI SUBSP, NOV.

LSIDurn:lsid:zoobank.org:act:8D16E354-1C65-4895-91DC-0845271CD0EF

Holotype: A preserved female specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39942, collected from the Beetaloo Reservoir Catchment, north-west of the reservoir, South Australia, Australia, Latitude -33.18 S., Longitude 138.20 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R16258 and R16259 collected from Horsnell Gully Conservation Park, South Australia, Australia, Latitude -34.93 S., Longitude 138.72 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large

and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered

with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump.

Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange.

Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-

brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged in any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axilla of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axilla of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. semimarmorata burrelli* subsp. nov. occurs in the region between Adelaide and Port Pirie, in South Australia in close proximity to *P.*

jasminegranta sp. nov. (but usually occupying areas of lower elevation to the west of the higher elevation areas, or alternatively in wetter zones and not the rain shadow mainly to the east).

Continues in *Australasian Journal of Herpetology* Issue 51 (pages 65-128) ...

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