Focusing on the Landscape

Biodiversity in Australia's National Reserve System

Part A: Fauna

A Report for Caring for Our Country

Prepared by Industry and Investment, New South Wales

Forest Science Centre, Forest & Rangeland Ecosystems.

PO Box 100, Beecroft NSW 2119 Australia.

Table of Contents

Figures

Tables

Executive Summary

We compared the location of fauna records (record sites) with the protected area network of Australia for the following diverse groups: anurans (frogs), mammals, birds, reptiles, mygalomorphae (trap-door) spiders, sparassidae (huntsman) spiders, lepidoptera (butterflies), land snails, dytiscidae (water beetles) and odonata (dragonflies and damselflies). We determined how many record sites fell within protected areas (PAs) and assessed whether the available distribution of record sites matched that which could be expected by random chance. We also determined the number of PAs in which each species was located and how many were found in larger (>1000 ha) PAs. This latter category is considered to be of importance as larger PAs are thought to provide significantly better long-term protection to species. They represent larger areas of more diverse habitats that can support larger populations that are more likely to survive local catastrophic events and so survive in relative perpetuity. Species in smaller reserves will be present in smaller populations and so are considered more likely to suffer major decline due to individual "local" events that affect habitats (eg, fire, disease) leaving them prone to extinction. They also are likely to have less genetic diversity and so have less long-term ability to adapt to changing conditions within their PA and region.

The 2006 Collaborative Australian Protected Areas Database (CAPAD) lists 8780 International Union for the Conservation of Nature (IUCN) criteria "reserves" that protect 768,826,956 hectares (11.6%) of mainland Australia (forming Australia's National Reserve System (NRS)). We obtained data for 6590 species, but 15 vertebrate species were considered extinct and removed from analysis. Also, 30 or fewer records were available for 302 vertebrate species (15.9%) and ten or fewer records for 3021 invertebrate species (64.4%). These species were not included in the further detailed analysis, but it was notable that vertebrate species in this category are usually located in northern and inland Australia and represent only small proportions of the total vertebrate species. Hence, the vertebrates are generally well understood in their distributions and habitat requirements. For the invertebrates, the smaller number of records to enter this category still resulted in more species being listed as "poorly known". For nearly all of these species, their ranges and habitat requirements are essentially unknown and it is reasonable to state that we currently have no knowledge of their conservation status. These species come from all over Australia, although, again, there is a tendency for species in this category to come from the less populated regions of Australia.

The data for the 1550 remaining extant vertebrate species and 1669 invertebrate species is summarised in **Tables 1** and **2**. These species have an average of 20.46% of their record sites within PAs, far above the 11.6% of land protected by PAs across Australia, indicating that records are much more likely to come from PAs than would be expected by chance. A total of 649 species have >45% of record sites in PAs and 441 species <10% of record sites within PAs. Species of vertebrates are far more likely to have relatively larger proportions of their record sites within reserves than they are to be poorly represented in reserves. Birds in particular are very well recorded, reflecting that relative ease of surveying for birds and the large number of amateur bird watchers who contribute extensively to the databases. Interestingly, birds have relatively low proportions of records in reserves compared to the other vertebrates, but the majority of species have been recorded in large numbers of reserves and so are broadly protected in the NRS. Frogs appear to be relatively represented in PAs as

are mammals. Reptiles are the least well recorded group. Reptiles are less likely to be surveyed and reported by people and so have relatively less information available on their presence inside or outside of the PA network. Of particular note is that no reptile species is located in greater than 100 large reserves, which is the category most likely to provide a secure conservation future. Further survey work is likely to change this and is highly recommended.

In contrast to the vertebrate groups, invertebrates are equally likely to be poorly reserved as they are to be well reserved. That is, an invertebrate species is equally likely to have less than 10% of the available records in PAs as it is to have over 45% of its known records within PAs. Over 50% of the invertebrate taxa represented by more than 10 record sites are known from fewer than 100 PAs. Invertebrates tend to have much smaller distributions than vertebrates and so it is expected that they will fall into less PAs on average; they do not occur in distributions encompassing large numbers of PAs. However, as with the reptiles, there are still many species with larger distributions that still are not known from more than 100 PAs whereas they may be expected to do so.

Table 1 Summary of vertebrate taxa in the National Reserve System (NRS). Well Reserved = >45% of Record Sites within PAs; Under Reserved = <10% Record Sites within PAs Large PAs = PAs larger than 1000ha

Taxa	No. Species (>30 records)	Total No. Records	No. of species (≤30 records)	No. Species Well Reserved	No. Species Under Reserved	% Species > 100 PAs	% Species > 100 Large PAs	% Species ≤ 5 PAs	% Species ≤ 5 Large PAs
Anurans	169	95967	41	36 (21.3%)	18 (10.6%)	11.24	9.47	14.20	13.02
Mammals	242	412781	36	61 (25.2%)	8 (3.3%)	23.55	19.83	15.29	16.12
Reptiles	579	325282	212	123 (21.2%)	46 (7.9%)	10.36	7.60	19.52	20.55
Non-passerines	282	3564629	3	12 (4.8%)	13 (5.2%)	68.67	58.63	2.81	2.81
Passerines	311	4970597	10	47 (15.1%)	13 (4.1%)	53.70	49.20	4.50	5.79

Table 2 Summary of invertebrate taxa in the NRS – Codes as for Table 1.

Taxa	No. Species (>10 records)	No. Records	No. species (≤10 records)	No. Species Well Reserved	No. Species Under Reserved	% Species > 100 PAs	% Species > 100 Large PAs	% Species ≤ 5 PAs	% Species ≤ 5 Large PAs
Odonata	168	9227	115	38 (22.6%)	30 (17.9%)	0.00	0.00	53.57	52.98
Lepidoptera	362	52914	80	46 (12.7%)	49 (13.5%)	0.83	0.28	35.91	37.57
Pulmonata	727	38702	1187	178 (24.5%)	159 (21.9%)	0.00	0.00	55.30	58.18
Mygalomorphae	128	7703	481	22 (17.2%)	49 (38.3%)	0.00	0.00	47.66	50.78
Sparassidae	30	889	86	6 (20.0%)	7 (23.3%)	0.00	0.00	43.33	46.67
Carabidae	204	6537	999	74 (36.3%)	49 (24.0%)	0.00	0.00	63.73	64.71
Dytiscidae	50	1668	73	6 (12.0%)	0 (0.0%)	0.00	0.00	62.00	62.00

Introduction

Australia has a diverse fauna with a very high level of endemism. However, the fauna of Australia is under threat from several areas and remains in need of protection. Land clearance represents a very serious threat to the ongoing survival of most species. Since 1788, over 700,000 km^2 (about 20%) of woodland and forest have been cleared or thinned, primarily for crops and grazing. A further 130,000 km^2 (35%) of mallee has been cleared since 1788, along with 20,000 km^2 of heath (45%), over 60,000 km^2 (10%) of tussock grassland and smaller areas of other grasslands (National Land and Water Resources Audit 2001). Habitat loss continues with the 2001 annual rate of vegetation clearance being around 248,000 hectares (National Land and Water Resources Audit 2001). Hence, habitat loss is a serious threat for species where the majority of habitat required is already lost or under immediate threat.

The Australian Government is building a network of protected areas, called the National Reserve System (NRS), which aims to "contain samples of all ecosystems identified at an appropriate regional scale" (see http://www.environment.gov.au/parks/nrs/science/scientific-framework.html). More specifically, this is based on the widely used criteria of preserving a minimum of 10% of each biome (McNeely 1993; Archer and Orr 2008). Furthermore, the criteria based on the Regional Forest Agreements (RFAs) to protect the remaining forests in Australia is a target of 15% of pre-1750 (pre-European) vegetation types (Commonwealth of Australia 1996), although this has not always been achieved (e.g., Flint et al 2004). Whilst sound in principle, the actual success of these reserves in protecting populations of species remains unknown.

A simple approach to assessing the potential effectiveness of reservations in protecting species is to determine the proportion of record sites (from hereon simply records) for each species that falls within Protectes Areas (Pas). Few records falling within PAs suggests that a species may not be well protected. Conversely, if relatively large numbers of records fall within PAs, then a species may be moderately secure from the effects of habitat loss and degradation. Overall, we could expect the percentages of records in PAs to be similar to the percentage of reserved lands available within Australia.

Additional means of assessing the effectiveness of PAs in protecting fauna relate to their size and the number of reserves that contain populations of a species. Island biogeography theory suggests that larger reserves are more valuable as conservation areas than small ones due to edge effects, area to perimeter ratios, greater ranges of habitats and larger areas having larger populations that are likely to be more robust (Lomolino, 1994). Greater conservation value is also likely where populations occur in multiple PAs rather than one single PA as localised extinctions due to stochastic events are almost inevitable. Hence, a spread of populations across the landscape should lessen the likelihood of total extinction whilst increasing the opportunities for rescue events through recolonisation, providing that areas remain connected. The number of larger PAs in which species are found and the number of PAs in total are two potentially useful measures of the capabililty of the NRS to protect a species.

In this study, we collate record sites for each species in a range of speciose groups and determine the number and proportions of records within listed NRS protected areas (PAs), including in how many different reserves species are found and how many of these PAs are 1000 ha or larger (following Rodrigues et al 2004). We are particularly interested in seeing if there are common biological or geographical characteristics for species that are either well or under "reserved". This can provide indications of the level of protection likely to be

afforded to species for which we have few site records. Species that are likely to be under represented in PAs can be considered for priority conservation action if land clearance and/or degradation is/are likely to be an immediate and severe threatening process.

Methods

The methods used in this paper are based on those used to undertake a similar analysis of frogs by Lemckert et al (2009).

The 2006 CAPAD database lists 8780 IUCN criteria PAs (see Figure 1) that protect 768,826,956 hectares (11.6%) of continental Australia, including Tasmania (see **Table 3**). This level of reservation provided the baseline for comparisons of the expected reservation levels for each group.

Records for each group were supplied by the Australian Government Department of the Environment, Water, Heritage and the Arts through the Australian Natural Heritage Assessment Tool (ANHAT) database. This database has been compiled from specimen and site records held in State, Territory and Commonwealth flora and fauna collections and wildlife atlases, and from the work of individual researchers. ANHAT is a custom-designed analysis tool built on Microsoft Access (Microsoft, 2003) and ArcGIS geographic information system (ESRI, 2005).

Data was supplied on the following terrestrial groups: mammals, birds, reptiles, frogs, trap-door spiders, huntsman spiders, butterflies, land snails, carabidae land beetles, dytiscidae water beetles and the dragonflies and damselflies. This included data on species that have yet to be formally described.

Records dated pre-1950 were excluded from the data sets, as earlier historical site records rarely have sufficient spatial accuracy for this type of analysis. Furthermore, site records with a spatial error range >20 km were excluded and duplicate records removed. Records within 500 m of each other were considered the same site and listed as a single spatial record.

Due to time limitations, review of taxonomic and nomenclatural changes of the species in ANHAT was not performed. Time limitations also meant that names of undescribed species were not able to be put into the correct taxonomic format, so that in many cases informal names may appear italicised and/or not indicative of taxonomic rank.

Within each of the nine groups, any species with fewer than 30 records for vertebrates and fewer than 10 records for the invertebrates was noted and removed from further consideration. Such species may have been rarely recorded because they are rare, because they occur in remote locations, because they are very cryptic or through a combination of these factors. Regardless, we removed them because we believe it is difficult to assess the relative state of reservation of such species with reasonable accuracy. For example, if a species has two site records and both fall in a reserve, it is not reasonable to assume that it is highly protected when most of its predicted range falls outside of reserves. We also removed species that are now considered extinct, have suffered recent serious declines or have been named relatively recently. Records for recently declined species may not provide an accurate assessment because many are from sites where the species is not longer extant. The recovery of these species is unpredictable and so assessing their relative reservation levels into the future is difficult.

Figure 1 Location of protected areas within the Australian Protected Area Network (taken from http://www.environment.gov.au/parks/nrs/science/locations.html).

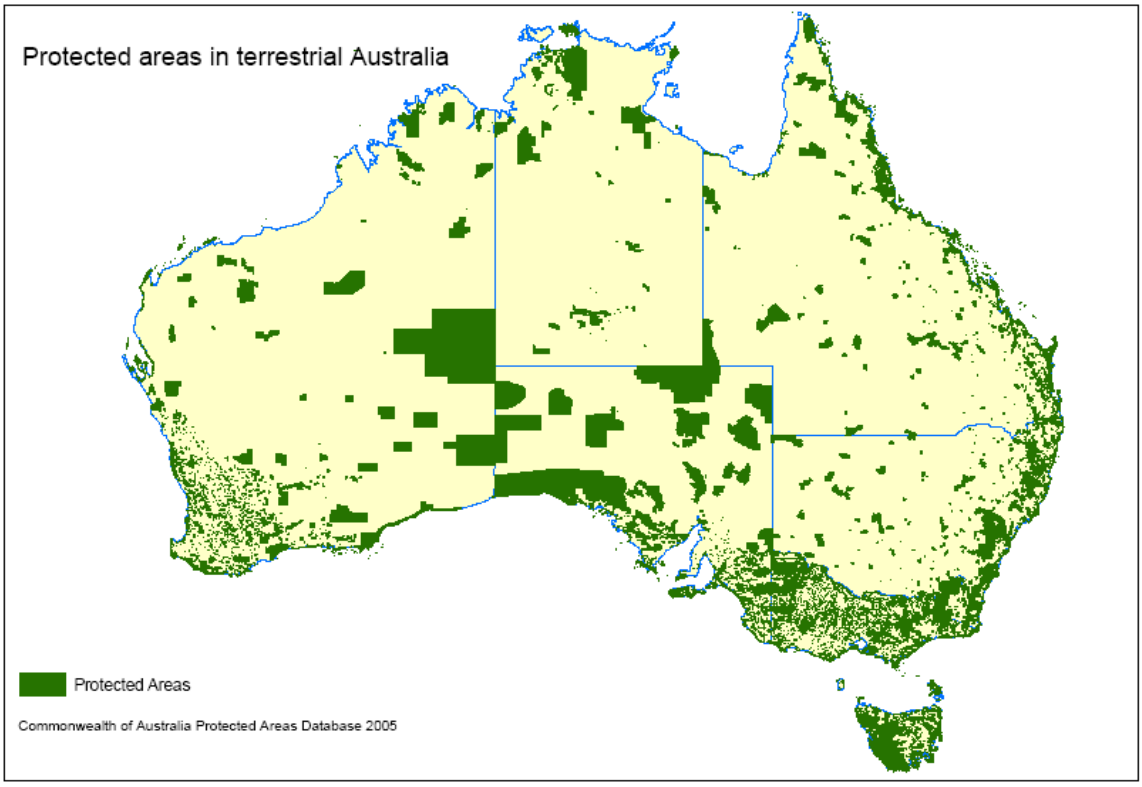

Table 3 Area of IUCN category reserved lands within each state of Australia (http://www.environment.gov.au/parks/nrs/science/capad/2006/index.html)

	Total Area (ha)	Reserve Area (ha)	Reserve Count	% Area
Australia	768,826,956	89,528,859	8,780	11.6
ACT	235,813	129,040	42	54.7
NSW	80,121,268	6,755,798	736	8.4
NT	134,778,762	7,889,765	95	5.9
QLD	172,973,671	9,608,482	854	5.6
SA	98,422,137	25,115,119	1,845	25.5
TAS	6,840,133	2,721,392	940	39.8
VIC	22,754,364	3,832,094	2,784	16.8
WA	252,700,808	33,477,165	1,484	13.2

The site records of the remaining species were compared to Australia's NRS (based on the 2006 CAPAD database) using the six IUCN recognized protected area categories to define reserves (http://www.iucn.org/about/union/commissions/wcpa/wcpa_overview/index.cfm).

We determined three categories of information for each species: 1) how many site records fell within PAs; 2) in how many different PAs each species was recorded; and 3) in how many PAs greater than 1000 ha each species was recorded. We were especially interested in determining which species had obviously larger or smaller percentages of their site records falling within PAs and if the species in each shared common characteristics. Hence, we listed the species within the "high" and "low" reservation categories for each group and noted for each their broad location within Australia and their known broad habitat preferences. The main sources of information used in the assessment of each of the groups are listed below:

Anurans: GAA (2001).

Mammals: Van Dyck, S., and Strahan, R. (2008), Menkhorst and Knight (2001) and Churchill (2008)

Birds: Barrett et al (2003)

Reptiles: Wilson and Swan (2003)

Butterflies: Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home) and Braby (2004).

Land Snails: Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Trapdoor Spiders: Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Huntsman Spiders: OZCAM (2009) and Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Odonata: Theischinger and Hawking (2006) and Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Carabidae: Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Dytiscidae: Australian Faunal Directory (http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home)

Table 4 Codes for location distributions

Location	description
ACT	Australian Capital Territory
CN	Central North Australia
CS	Central South Australia
E	Eastern Australia
I	Inland Australia
MAW	Mainland Aust. Wide
NE	North East Australia
NSW	New South Wales
NT	Northern Territory
NW	North West Australia
QLD	Queensland
SA	South Australia
SE	South East Australia
SW	South West Australia
TAS	Tasmania
UnV	Uncommon & Vagrant Species
UR	Unrecorded
VIC	Victoria
W	West Australia
WA	Western Australia

Table 5 Vegetation type codes

Vegetation Type	Code
Alluvial Flats/Floodplain	AF
Alpine	Al
Arid	Ar
Caves	Cave
Cliffs	Cl
Coastal	Co
Coastal Flats	CF
Coastal Swamplands	CSw
Coastal Veg	CV
Dune Fields	DF
Eucalypt	Euc
Farmland	FL
Forest	For
Generalist	Gen
Gorges	Gor
Grassland	GrL
Heath	He
High Rainforest	HRG
Hummock Grass	HG
Limestone	LS
Litter	Lit
Mallee	Mal
Mangroves	Man
Montane	Mon
Mulga	Mul
Open Country	Op
Rainforest	RF
Rocky Habitats	RH
Riparian	Rip
Salt Lake	SaL
Salt Bush	SB
Salt Marsh	SM
Sandy Plains	SaP
Sandstone	Sand
Scrub	Sc
Semi Arid	SAr
Shrublands	SL
Spinifex	Sp
Thicket	Th
Urban	Urb
Wetland	Wet
Woodland	WL

Table 6 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) threatened status codes

Code	Threatened status
CE	Critically endangered
EN	Endangered
VU	Vulnerable
CD	Conservation dependant
NL	not listed under the EPBC Act
EX	Extinct

Table 7 Codes for more detailed location distributions

Location Code	Location	Description
W	West	Bound by 120 ^{o} E longitude in the east and 30 ^{o} S latitude in the south and 20 ^{o} S latitude in the north.
SW	South West	Bound by Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the east and 30 ^{o} latitude S in the north.
NW	North West	Bound by 20 ^{o} S latitude in the south and Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the east.
WI	West Inland	Bound by 20 ^{o} S latitude in the north and by 120 ^{o} E longitude in the west, 30 ^{o} S latitude in the south and by Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the east.
CN	Central North	Bound by Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the west, 141 ^{o} E longitude in the east (in line with NSW/South Australian border) in the east and 20 ^{o} S latitude in the south.
CI	Central Inland	Bound by Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the west, 141 ^{o} E longitude in the east (NSW/South Australian border) in the east, approx 20 ^{o} S latitude in the north and 30 ^{o} S latitude in the south.
CS	Central South	Bound by Northern Territory/Western Australian border (approx 129 ^{o} E longitude) in the west, 141 ^{o} E longitude in the east (NSW/South Australian border) in the east and 30 ^{o} S latitude in the south.
NE	North East	Bound by 141 ^{o} E longitude in the west (in line with NSW/South Australian border) and 20 ^{o} S latitude in the south.
E	East	Bound by 146 ^{o} E longitude in the west and 20 ^{o} S latitude in the north and 34 ^{o} S latitude (approx Sydney) in the south.
EI	East Inland	Bound by 141 ^{o} E longitude in the west (in line with NSW/South Australian border) and 146 ^{o} E longitude in the east and by 20 ^{o} S latitude in the north and 34 ^{o} S latitude (approx Sydney) in the south.
SE	South-East	Bound by 141 ^{o} E longitude in the west (Victorian/South Australian border) and 34 ^{o} S latitude (approx Sydney) in the north.
TAS	Tas	Tasmania
TAS Is	TAS Is	Islands around Tasmania

Anurans

We were able to extract 96947 post-1950 site records for 211 species of frogs. Of these, 25961 site records (26.78%) fell into IUCN PAs, which is much higher than the comparative figure of 10.54% of lands reserved. The mean and median numbers of PAs in which a species occurs are 32 and 16 reserves respectively.

One species is considered as extinct and therefore excluded from analysis (**Table 8a**).

Table 8 Anuran species considered extinct

Species	Common Name	No. Records
Rheobatrachus vitellinus	Northern Gastric-breeding frog	6

We removed 41 species for which we had 30 or fewer site records available (Table **9b**).

Nine of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which reflects the fact that this group has recently undergone significant declines. Twenty-seven species come from the northern parts of Australia.

Table 9b List of anuran species with 30 records or fewer in the ANHAT database. Species in bold are listed as threatened under the EPBC Act.

General Location in Australia – N = North, E = East, S = South, W = West, I = Interior and C = Central Australia. Vegetation Types – RF = Rainforest, For = Forest, WL = Woodlands, GrL = Grasslands.

Taxon Name	Records	Location/Veg Type	EPBC Status
Geocrinia lutea	1	SW, For	NL
Geocrinia vitellina	**1**	**SW, For**	**VU**
Pseudophryne covacevichae	**2**	**NE, For**	**VU**
Uperoleia orientalis	3	CN, WL	NL
Litoria andiirrmalin	4	NE, RF	NL
Notaden weigela	5	NW, WL	NL
Cophixalus peninsularis	7	NE, RF	NL
Cophixalus zweifeli	7	NE, For	NL
Philoria richmondensis	9	CE, For	NL
Cophixalus monticola	10	NE, RF	NL
Uperoleia martini	10	SE, For	NL
Litoria lorica	**11**	**NE, For**	**CE**
Spicospina flammocaerulea	**11**	**SW, For**	**EN**

Uperoleia arenicola	12	CN, WL	NL
Litoria cavernicola	13	NW, WL	NL
Uperoleia glandulosa	13	CW, WL	NL
Litoria piperata	**14**	**CE, For**	**VU**
Geocrinia rosea	15	SW, For	NL
Litoria electrica	15	NI, WL	NL
Uperoleia talpa	15	NW, GrL	NL
Litoria burrowsae	16	Tas, For	NL
Cophixalus macdonaldi	17	CE, RF	NL
Uperoleia micromeles	17	NI, GrL	NL
Taudactylus liemi	18	NE, For	NL
Uperoleia minima	20	NW, GrL	NL
Uperoleia altissima	21	NE, For	NL
Pseudophryne douglasi	21	CW, WL	NL
Litoria daviesae	21	CE, For	NL
Uperoleia capitulate	22	CI, WL	NL
Uperoleia mjobergii	23	NW, WL	NL
Limnodynastes depressus	24	CN, WL	NL
Taudactylus eungellensis	**24**	**NW, For**	**EN**
Taudactylus pleione	**24**	**NW, For**	**VU**
Taudactylus rheophilus	**25**	**NW, For**	**EN**
Litoria gilleni	26	CI, GrL	NL
Cophixalus saxatilis	26	NW, For	NL
Uperoleia aspera	27	NW, GrL	NL
Uperoleia crassa	27	NW, WL	NL
Cyclorana manya	29	NE, WL	NL
Litoria nyakalensis	**30**	**NE, For**	**CE**
Litoria personata	30	CN, WL	NL

Table 10 Species of anurans with > 45% of record sites in PAs.
Locations – N = North, E = East, S = South, W = West, Tas = Tasmania, I = Interior and C = Central Australia. M = Montane Species. Vegetation Types – CHe = Coastal Heathlands, CSw = Coastal Swamplands, GrL = Grasslands, For = Forest, RF = Rainforest and WL = Woodlands.

Species	Records	In PAs	% in PAs	Location, Veg type	Area (km^2)	Status
Uperoleia tyleri	84	38	45.2	SE, CHe	82356	NL
Austrochaperina adelphe	37	17	45.9	N, WL	109688	NL
Litoria littlejohni	**167**	**77**	**46.1**	**SE, CHe**	**84256**	**VU**
Pseudophryne pengilleyi	**292**	**136**	**46.6**	**M-SE, WL**	**1110**	**VU**
Litoria xanthomera	96	45	46.8	NE, RF	19572	NL
Philoria sphagnicolus	255	121	47.4	M-E, RF	9582	NL
Litoria spenceri	**140**	**67**	**47.9**	**SE, For**	**16572**	**EN**
Heleioporus australiacus	**449**	**217**	**48.3**	**SE, CHe**	**79633**	**VU**
Austrochaperina robusta	171	85	49.7	M-NE, RF	8863	NL
Crinia tasmaniensis	60	31	51.7	Tas, For	55923	NL
Philoria frosti	**36**	**19**	**52.8**	**M-SE, WL**	**103**	**EN**
Litoria verreauxii alpina	**123**	**69**	**56.1**	**M-SE, WL**	**NA**	**VU**
Austrochaperina pluvialis	104	59	56.7	NE, RF	13730	NL
Litoria genimaculata	565	322	57.0	NE, RF	40,000	NL
Cophixalus ornatus	448	256	57.1	NE, RF	14771	NL

Lechriodus fletcheri	715	410	57.3	E, RF	63120	NL
Nyctimystes dayi	**199**	**125**	**62.8**	**NE, RF**	**18866**	**EN**
Mixophyes fleayi	**101**	**64**	**63.4**	**E, RF**	**16803**	**EN**
Litoria barringtonensis	84	54	64.3	E, For	NA	NL
Litoria rheocola	**301**	**196**	**65.1**	**NE, RF**	**15211**	**EN**
Mixophyes schevilli	252	166	65.9	NE, RF	19347	NL
Litoria nannotis	**177**	**118**	**66.7**	**NE, RF**	**19013**	**EN**
Cophixalus infacetus	75	53	70.7	NE, RF	8232	NL
Philoria kundagungan	63	45	71.4	M-E, RF	1603	NL
Litoria olongburensis	**188**	**139**	**73.9**	**C-E, CSw**	**8340**	**VU**
Litoria cooloolensis	122	92	75.4	C-E, CSw	2434	NL
Assa darlingtoni	530	431	81.3	M-E, RF	36032	NL
Cophixalus hosmeri	75	61	81.3	M-NE, RF	348	NL
Austrochaperina fryi	177	144	81.4	NE, RF	6396	NL
Philoria loveridgei	238	207	87.0	M-E, RF	451	NL
Cophixalus concinnus	118	10.	87.3	M-NE, RF	14	NL
Cophixalus neglectus	41	36	87.8	M-NE, RF	562	NL
Pseudophryne corroboree	**94**	**84**	**89.4**	**M-SE, WL**	**1079**	**EN**
Cophixalus bombiens	39	38	97.4	M-NE, RF	491	NL
Cophixalus exiguous	54	53	98.1	M-NE, RF	72	NL
Bryobatrachus nimbus	33	33	100	M-Tas, GrL	4138	NL

Table 11 Species of anurans with <10% of record sites within PAs.
Locations – N = North, E = East, S = South, W = West, Tas = Tasmania, I = Interior and C = Central Australia. Ag = Agricultural Lands (species with ranges falling mainly in the productive cropland areas). Vegetation Types – CSw = Coastal Swamplands, GrL = Grasslands, RF = Rainforest and WL = Woodlands.

Species	Records	In PAs	% in PAs	Location, Veg type	Range (km^2)	Status
Cyclorana cryptotis	86	0	0	N, GrL	386850	NL
Uperoleia trachyderma	43	0	0	N, GrL	241151	NL
Neobatrachus aquilonius	83	1	1.2	NW, GrL	437210	NL
Crinia insignifera	251	9	3.6	SW, CSw	5981	NL
Cyclorana vagitus	47	2	4.3	NW, GrL	43809	NL
Cyclorana maculosa	42	2	4.8	I-N, GrL	557410	NL
Neobatrachus fulvus	41	2	4.9	W, WL	19214	NL
Litoria longirostris	39	2	5.1	NE, RF	7096	NL
Notaden nichollsi	319	19	6.0	I-W, GrL	1809287	NL
Limnodynastes fletcheri	813	58	7.1	Ag-E, WL	1345573	NL
Cyclorana cultripes	112	8	7.1	N, GrL	401761	NL
Neobatrachus wilsmorei	123	9	7.3	W, WL	504571	NL
Cyclorana verrucosa	66	5	7.6	Ag-E/WL	391718	NL
Cyclorana brevipes	149	12	8.1	Ag-E/GrL	852282	NL
Limnodynastes salmini	295	26	8.8	Ag-E, WL	604289	NL
Cophixalus crepitans	34	3	8.8	NE, RF	1127	NL
Uperoleia rugosa	299	27	9.0	Ag-E, WL	962875	NL
Litoria alboguttata	330	32	9.7	Ag-NE, GrL	1250564	NL

The removal of these species leaves a new total of 95967 site records for 169 species, with 25501 site records (26.6%) falling within a PA. The mean percentage of site records within PAs for each

species is 32.0%. The mean number of records per species for species with greater than 30 records was 873.3. Thirty-six species have >45% and 18 species <10% of their site records within IUCN PAs (

Table 10 & **Table 11** respectively). One species, *Bryobatrachus nimbus* (33 record sites), has all site records falling within PAs whilst two species, *Cyclorana cryptotis* (86 sites) and *Uperoleia trachyderma* (43 sites), have none falling in PAs.

Some trends can be seen in the species with relatively high representation in PAs. Fifteen of the 36 species are found mostly or entirely within montane areas of eastern Australia, with 22 being either essentially or substantially rainforest dependent. A further five species are wholly or mostly restricted to near coastal heath or swamp habitats of eastern Australia. The only two species not within these three groups are *Austrochaperina adelphe,* which is found in lowland areas of far northern Australia and *Crinia tasmaniensis* from Tasmania. This latter species also has significant parts of its range in upland areas. Despite the reasonably high percentages of site records in PAs, only 12 of the 34 species are listed as threatened.

The major group with relatively few site records within PAs consists of seven species from the major agricultural zones of eastern and western Australia and the remainder come from the more remote parts of Australia where minimal surveying has been carried out. Eleven of these 18 species are burrowing species and no arboreal species are represented in this list.

Table 12 List of anuran species recorded from more than 100 PAs

Species	***No. Records***	***No. PAs***	***No. PAs > 1000ha***
Adelotus brevis	1196	102	90
Litoria dentate	1068	108	84
Mixophyes fasciolatus	1673	112	95
Litoria ewingii	1462	121	96
Litoria nasuta	1626	125	91
Pseudophryne coriacea	1835	128	98
Litoria verreauxii	1795	134	109
Litoria rubella	2705	144	115
Pseudophryne bibroni	1518	144	111
Limnodynastes ornatus	2264	148	121
Litoria latopalmata	2319	193	156
Limnodynastes tasmaniensis	3355	202	147
Litoria fallax	3231	202	144
Litoria caerulea	3631	208	155
Limnodynastes dumerilii	2520	216	163
Litoria peronii	2895	216	172
Litoria lesueuri	3393	233	203
Limnodynastes peronii	3565	248	179
Crinia signifera	7216	377	266

Table 12 and **Table 13** provide lists of species that have been recorded in more than 100 or fewer than five IUCN reserves respectively and also the number of these reserves that are above 1000 ha in size. All of the 19 species found in more than 100 reserves have large numbers of site records, are from eastern Australia and are at least partly or totally coastal in

range. The majority of the reserves are also larger reserves of more than 1000 ha in size. These species all have relatively large percentages of site records falling in reserves. The 24 species recorded from fewer than five reserves commonly have few overall site records and tend to be found in northern or western Australia. There are also a few species that have very small ranges and so are necessarily found in very few reserves. *Pseudophryne corroboree* is the best example in being found in only one reserve, but having nearly all of its records within this reserve. Notably, almost all of the reserves from which these "lesser" protected species have been recorded are of more than 1000 ha in size.

Table 13 List of anuran species recorded from fewer than five PAs

Species	***No. Records***	***No. PAs***	***No. PAs > 1000ha***
Cyclorana cryptotis	86	0	0
Uperoleia trachyderma	43	0	0
Cyclorana vagita	47	1	1
Litoria longirostris	39	1	1
Neobatrachus aquilonius	83	1	1
Neobatrachus fulvus	41	1	1
Pseudophryne corroboree	94	1	1
Arenophryne rotunda	56	2	2
Cophixalus bombiens	39	2	2
Cophixalus crepitans	34	2	1
Cophixalus exiguous	54	2	2
Cyclorana maculosa	42	2	2
Cyclorana verrucosa	66	2	2
Philoria frosti	36	2	2
Philoria pughi	49	2	2
Uperoleia littlejohni	33	2	2
Bryobatrachus nimbus	33	3	3
Cophixalus neglectus	41	3	2
Crinia subinsignifera	40	3	3
Litoria eucnemis	55	3	3
Uperoleia russelli	117	3	3
Crinia sloanei	37	4	4
Austrochaperina adelphe	37	4	4
Austrochaperina gracilipes	134	4	3

Mammals

The ANHAT database has 413834 records for 290 species and subspecies of terrestrial mammals. Four species of freetail bat (*Mormopterus* sp.) are currently unnamed although recognised as separate species (Churchill 2008), and have thus been retained here.

Marine mammals were not considered for analysis. Twelve species of mammals are considered extinct and therefore excluded from analysis. These species are presented in **Table 14**. The majority are small to mid-sized terrestrial species for which the declines have been well documented and appear to have resulted from the impacts of introduced species. The thylacine was hunted to extinction.

Table 14 Mammal species considered extinct

Species	Common Name	No. Records
Chaeropus ecaudatus	Pig-footed Bandicoot	12
Conilurus albipes	White-footed Rabbit-rat	1
Lagorchestes asomatus	Central Hare-wallaby	8
Macropus greyi	Toolache Wallaby	1
Macrotis leucura	Lesser Bilby	6
Notomys amplus	Short-tailed Hopping-mouse	12
Notomys longicaudatus	Long-tailed Hopping-mouse	11
Onychogalea lunata	Crescent Nail-tail Wallaby	16
Perameles eremiana	Desert Bandicoot	15
Potorous platyops	Broad-faced Potoroo	1
Pseudomys gouldii	Gould's Mouse	2
Thylacinus cynocephalus	Thylacine	400

Fifteen species account for almost 50% of the total species records in ANHAT. These species have over 7000 records each and in the case of the Koala (*Phascolarctos cinereu*s) over 26000 records.

Table 15 Mammal species which account for almost 50% of the total species records in ANHAT.

Species	No. Records	% total records
Nyctophilus geoffroyi	7326	1.77
Chalinolobus gouldii	7474	1.81
Vespadelus vulturnus	7564	1.83
Petaurus australis	9696	2.34
Petaurus breviceps	11293	2.73
Macropus robustus	11320	2.74
Petauroides volans	11623	2.81
Rattus fuscipes	12606	3.05
Pseudocheirus peregrinus	13038	3.15
Macropus giganteus	14584	3.52
Wallabia bicolor	16723	4.04
Vombatus ursinus	18724	4.52
Tachyglossus aculeatus	18767	4.53
Trichosurus vulpecula	18899	4.57
Phascolarctos cinereus	26479	6.40
Total	206116	49.81

Thirty-six species had 30 or fewer individual site records in the ANHAT database (**Table 16**). Of those species, 14 are listed as threatened (including one species classified as critically endangered). There are few obvious patterns in this data, but most species come from northern parts of Australia and are found in rainforest, forest or woodlands and so are relatively dependent on denser native vegetation. These species have been excluded from and further analysis.

Table 16 Mammal species with 30 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Rhinolophus megaphyllus ignifer	1	100.0	E, NE	RF, For, For	100	NL
Nyctimene cephalotes	2	0.00	Moa Is	RF	300	NL
Rattus exulans	4	75.0	Is NE & NW	Urb, FL, For	300	NL
Taphozous troughtoni	4	25.0	E, NE	For, WL, Mul, Sp, GrL	400	NL
Saccolaimus saccolaimus nudicluniatus	**5**	**0.0**	**NE**	**WL, For**	**400**	**CE**
Pseudantechinus mimulus	**7**	**14.3**	**I, CN**	**WL**	**500**	**VU**
Pseudocheirus cinereus	7	100.0	NE	RF	400	NL
Petrogale lateralis pearsoni	**8**	**75.0**	**Is CS**	**SL, Cl**	**700**	**VU**
Petrogale coenensis	10	0.0	NE	RH, RE, RH, WL	400	NL
Sminthopsis aitkeni	**10**	**50.0**	**CS, Kang. Is**	**Mal, He**	**800**	**EN**
Petrogale lateralis hacketti	**11**	**90.9**	**Is SW**	**Mal, SL, RO**	**500**	**VU**
Sminthopsis butleri	**11**	**0.0**	**CN**	**WL**	**900**	**VU**
Petrogale sharmani	12	8.3	NE	WL, WL	1000	NL
Uromys hadrourus	12	83.3	NE	RF	400	NL

Cercartetus caudatus	13	61.5	NE	RF	1400	NL
Notomys aquilo	**13**	**92.3**	**CN**	**DF, He, For, RF**	**1300**	**VU**
Parantechinus apicalis	**13**	**46.1**	**SW**	**Co, Mal, He**	**1200**	**EN**
Petrogale concinna monastria	16	18.7	CN	WL, Gor	1500	NL
Sminthopsis archeri	16	50.0	NE	WL	500	NL
Taphozous kapalgensis	16	43.7	CN	For, WL, Sw,	1300	NL
Pseudocheirus herbertensis	17	47.0	NE	RF	1100	NL
Saccolaimus saccolaimus	17	23.5	CN	WL, For	2000	NL
Dasyurus maculatus gracilis	18	66.7	NE	RF, For, SL,	1500	NL
Zyzomys palatalis	19	0.0	CN	RF, Sand, Gor, RH	700	**EN**
Saccolaimus mixtus	20	5.0	NE	For, WL, He	800	NL
Mormopterus sp 6	23	39.1				NL
Wyulda squamicaudata	23	13.0	NW	WL, For	1600	NL
Dendrolagus bennettianus	24	83.3	NE	RF	1700	NL
Petrogale concinna	25	36.0	NW, CN	RF, WL, GrL	2200	NL
Phalanger intercastellanus	25	44.0	NE	RF	600	NL
Pogonomys mollipilosus	25	72.0	NE	RF	1400	NL
Pseudomys fieldi	**25**	**96.0**	**W, I**	**Sp**	**1200**	**VU**
Sminthopsis longicaudata	27	29.6	W, I	HG, WL, Sp, Mul	2500	NL
Zyzomys pedunculatus	**29**	**82.8**	**I**	**HG, GrL, SL, RH**	**2100**	**EN**
Hipposideros semoni	**30**	**36.7**	**NE**	**RF, For, WL**	**2000**	**EN**
Perameles bougainville	**30**	**76.7**	**SW, SEI**	**Co DF**	**3500**	**EN**

Removal of extinct and poorly recorded species leaves 412781 records in ANHAT for 242 species (and subspecies). The mean number of records per species for species with greater than 30 records was 1706, with the mean of 31.8 for the percent of records in PAs. Sixty-one species of mammals had 45% or greater of individual site records located within PAs (**Table 17**). Of those 61 species, 14 species are classified as threatened, including seven species classified as endangered. The majority of species in this list can be found in southern Australia. There are also a significant number of species from the Central Northern area of Australia. Few species predominantly from inland areas and NW are in this group. These species showed the most affinities for woodlands, forests and shrublands. Species dependent on grassland areas are less well represented. No species had all records coming from within PAs.

Table 17 Mammal species with >45% of site records within the NRS.

Species	No records	No. Records in PAs	Location	Veg type	Area (km^2)	EPBC status
Dasyurus hallucatus	**1359**	**617 (45.4%)**	**N**	**For, WL**	**44400**	**EN**
Petauroides volans	11623	5300 (45.6%)	E-SE	For, WL	178100	NL
Macropus fuliginosus	3968	1811 (45.6%)	CS, SW, EI	Gen	234800	NL
Pseudomys occidentalis	45	21 (46.7%)	CS, SW	WL, SL	2600	NL
Sminthopsis granulipes	76	36 (47.4%)	SW	WL, SL	6300	NL
Thylogale thetis	1170	555 (47.4%)	E, Fraser Is	RF, For	27800	NL
Antechinus swainsonii	2583	1232 (47.7%)	SE, TAS	For, SL	75700	NL

Antechinus subtropicus	322	154 (47.8%)	E	WL	6300	NL
Hipposideros ater	256	123 (48.0%)	CN, NE	For, WL, GrL	15000	NL
Antechinus minimus	381	184 (48.3%)	SE, TAS	For, WL, Wet	16900	NL
Falsistrellus mackenziei	31	15 (48.4%)	SW	For	2600	NL
Isoodon obesulus	2174	1052 (48.4%)	N	For, WL, SL	60500	NL
Sminthopsis psammophila	**33**	**16 (48.5%)**	**CS, I**	**WL, GrL**	**1500**	**EN**
Vespadelus troughtoni	350	171 (48.9%)	E, NE	WL, For, RH	20500	NL
Thylogale stigmatica	443	219 (49.4%)	NE, E	RF, For	22900	NL
Cercartetus nanus	896	443 (49.4%)	SE, TAS	RF, For, SL	46800	NL
Sminthopsis hirtipes	160	80 (50.0%)	SW, CS	WL, SL	33800	NL
Sminthopsis dolichura	542	271 (50.0%)	I, W	WL, SL	10200	NL
Sminthopsis gilberti	101	51 (50.5%)	SW	WL	9800	NL
Nyctophilus timoriensis	**362**	**185** (51.1%)	**SW, CS SE, E, TAS**	**For, WL**	**28500**	**VU**
Melomys cervinipes	1783	932 (52.3%)	NE, E	RF, For, Wet, Man	62500	NL
Notoryctes typhlops	**174**	**91 (52.3%)**	**SEI**	**GrL**	**9600**	**EN**
Rattus colletti	342	179 (52.3%)	CN	Wet	10800	NL
Rattus tunneyi	1446	762 (52.7%)	W, NW, CN, NE	GrL, WL, For	60300	NL
Pseudomys fumeus	**242**	**129 (53.3%)**	**SE**	**For, SL**	**9800**	**EN**
Cercartetus concinnus	742	399 (53.8%)	SW,CS	For, SL	54900	NL
Rhinonycteris aurantius	292	158 (54.1%)	NW, CN	Gen	12300	NL
Trichosurus caninus	1638	891 (54.4%)	E	For	54100	NL
Petrogale rothschildi	55	30 (54.5%)	W	GrL	16800	NL
Nyctimene robinsoni	341	186 (54.5%)	E, NE	RF, For	3700	NL
Petrogale penicillata	**1354**	**743 (54.9%)**	**SE, TAS**	**RF, For, WL**	**35500**	**VU**
Uromys caudimaculatus	444	244 (54.9%)	NE	RF, For	14800	NL
Pseudomys pilligaensis	**114**	**63 (55.3%)**	**E**	**WL, SL**	**2700**	**VU**
Pseudomys higginsi	197	110 (55.8%)	TAS	RF, For	9400	NL
Petropseudes dahlia	168	94 (55.9%)	NW, CN	RH	8700	NL
Vespadelus douglasorum	37	21 (56.8%)	CN	WL	2500	NL
Notomys mitchelli	541	308 (56.9%)	SW, S	WL, GrL	33100	NL
Hemibelideus lemuroids	33	20 (60.6%)	NE	RF	1700	NL
Sminthopsis bindi	51	31 (60.8%)	CN	WL	3900	NL
Chalinolobus dwyeri	**391**	**239 (61.1%)**	**E**	**WL, For, RF**	**23400**	**VU**
Pseudomys albocinereus	215	132 (61.4%)	SW	WL, SL	12500	NL
Pseudomys apodemoides	471	293 (62.1%)	CS	WL, SL	15100	NL
Ningaui yvonneae	482	301 (62.4%)	SW,CS	WL, SL, GrL	18300	NL
Pseudomys shortridgei	**335**	**210 (62.7%)**	**SW, CS**	**For, SL**	**7400**	**VU**
Lasiorhinus krefftii	**46**	**29 (63.0%)**	**E, SE**	**WL**	**800**	**EN**
Cercartetus lepidus	262	170 (64.9%)	SE, TAS	For, WL, Wet	11700	NL
Pseudantechinus bilarni	120	78 (65.0%)	CN	WL	6800	NL
Pseudomys novaehollandiae	481	324 (67.4%)	E, Tas, SE	WL, For, Wet	17100	NL
Hypsiprymnodon moschatus	70	48 (68.6%)	S	RF	5400	NL
Burramys parvus	**374**	**265 (70.9%)**	**SE, TAS**	**SL**	**1700**	**EN**

Phascogale tapoatafa pirata	35	25 (71.4%)	CN	For	3000	NL
Bettongia lesueur	137	98 (71.5%)	Aus	WL	10100	NL
Mastacomys fuscus	512	376 (73.4%)	SE, TAS	For, SL	16400	NL
Onychogalea fraenata	**69**	**51 (73.9%)**	**EC,SE**	**For, WL, SL**	**2800**	**EN**
Macropus bernardus	56	42 (75.0%)	CN	GrL, WL	3600	NL
Leporillus conditor	**39**	**31 (79.5%)**	**CS, W**	**SL**	**3700**	**VU**
Zyzomys maini	**64**	**52 (81.2%)**	**CN**	**RF**	**2300**	**VU**
Antechinus bellus	268	232 (86.7%)	CN	WL	7400	NL
Lagostrophus fasciatus	38	33 (86.8%)	Bernier Is, Dorre Is	SL	1400	NL
Pseudomys calabyi	69	62 (89.9%)	CN	WL	2900	NL
Antechinus godmani	32	29 (90.6%)	NE	RF	1900	NL

Eight species had less than 10% of ANHAT records located within the NRS (**Table 18**). Five of the eight species are classified as threatened. These species are scattered widely across Australia and show no patterns in distribution. However, in terms of habitat, they are mostly commonly associated with grasslands, although these may be on dunes, gibber plains or in more mesic areas. All species had some records within the reserve system.

Table 18 Mammal species with <10% of ANHAT records located within the NRS.

Species	No. records	No. Records in NRS	Location	Veg type	Area (km^2)	EPBC status
Notomys cervinus	123	5 (4.1%)	SEI	GrL	7700	NL
Macrotis lagotis	**923**	**40 (4.3%)**	**WI, SC, EI**	**GrL**	**56200**	**VU**
Perameles gunnii	**2961**	**131 (4.4%)**	**S, TAS**	**GrL**	**34400**	**VU/EN**
Dasycercus byrnie	**341**	**22 (6.4%)**	**I**	**GrL**	**8100**	**VU**
Notomys fuscus	**131**	**9 (6.9%)**	**CS, I**	**GrL**	**10400**	**VU**
Onychogalea unguifera	819	58 (7.1%)	N	WL, SL, GrL	43500	NL
Lagorchestes conspicillatus	900	72 (8.0%)	S, W	GrL	45400	NL
Myrmecobius fasciatus	**34**	**3 (8.8%)**	**SW,CS**	**For, WL**	**7900**	**VU**

A total of 57 mammal species had records in more than 100 separate PAs (**Table 19**). Fifty-four species in this list had over a thousand records, with a mean of 5789 records per species. Only two species were listed as threatened, including the grey-headed flying fox, which is highly mobile and individuals will visit a wide range of locations throughout the year.

Table 19 Mammal species recorded at more than 100 PAs.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Cercartetus concinnus	742	100	60	NL
Aepyprymnus rufescens	1578	104	90	NL
Scoteanax rueppellii	761	105	87	NL

Sminthopsis crassicaudata	2325	105	91	NL
Myotis adversus	1225	109	86	NL
Cercartetus nanus	896	111	103	NL
Isoodon obesulus	2174	116	61	NL
Pteropus scapulatus	1442	119	96	NL
Scotorepens orion	1075	121	97	NL
Scotorepens greyii	1526	125	110	NL
Scotorepens balstoni	1201	131	118	NL
Macropus rufus	5126	131	116	NL
Falsistrellus tasmaniensis	1519	132	109	NL
Phascogale tapoatafa	2201	136	102	NL
Vespadelus pumilus	1684	137	118	NL
Saccolaimus flaviventris	1176	138	119	NL
Antechinus swainsonii	2583	143	116	NL
Trichosurus caninus	1638	149	120	NL
Antechinus agilis	5876	157	94	NL
Sminthopsis murina	1278	158	134	NL
Melomys cervinipes	1783	162	133	NL
Antechinus stuartii	4280	172	139	NL
Miniopterus australis	1919	176	136	NL
Petaurus norfolcensis	2626	185	145	NL
Rhinolophus megaphyllus	1761	192	172	NL
Pteropus poliocephalus	**3890**	**196**	**114**	**VU**
Isoodon macrourus	3405	218	161	NL
Acrobates pygmaeus	1708	224	194	NL
Miniopterus oceanensis	2690	234	192	NL
Ornithorhynchus anatinus	6496	244	181	NL
Hydromys chrysogaster	2202	247	188	NL
Macropus robustus	11320	249	208	NL
Dasyurus maculatus	**5260**	**251**	**210**	**EN/VU**
Rattus lutreolus	3708	255	187	NL
Vespadelus darlingtoni	4652	271	197	NL
Petaurus australis	9696	274	224	NL
Perameles nasuta	3804	276	214	NL
Antechinus flavipes	3387	288	208	NL
Macropus fuliginosus	3968	310	186	NL
Vespadelus regulus	4196	313	240	NL
Petauroides volans	11623	347	272	NL
Nyctophilus gouldi	3961	357	283	NL
Macropus rufogriseus	6938	382	279	NL
Vombatus ursinus	18724	422	276	NL
Vespadelus vulturnus	7564	428	305	NL
Chalinolobus morio	6855	453	345	NL
Phascolarctos cinereus	26479	463	307	NL
Tadarida australis	6384	485	355	NL
Rattus fuscipes	12606	518	357	NL
Nyctophilus geoffroyi	7326	539	402	NL
Chalinolobus gouldii	7474	566	442	NL
Petaurus breviceps	11293	587	427	NL
Pseudocheirus peregrinus	13038	589	358	NL
Macropus giganteus	14584	660	431	NL
Wallabia bicolor	16723	691	443	NL

Trichosurus vulpecula	18899	830	538	NL
Tachyglossus aculeatus	18767	859	548	NL

There were 37 species with records in five or fewer PAs (**Table 20**) of which 14 are listed as threatened. Eight species are listed as endangered. The majority of species in this list have fewer than 100 individual site records. These results reflect the declines and rarity in many mammal species and some more recent taxonomic changes that have left smaller periods of time to accumulate recognised species records.

Table 20 Mammal species recorded from five or fewer PAs.

Species	No. Records	No. PAs	EPBC status
Dasycercus hillieri	**31**	**1**	**EN**
Lagostrophus fasciatus	38	1	NL
Lasiorhinus krefftii	**46**	**1**	**EN**
Zyzomys maini	**64**	**1**	**VU**
Petrogale mareeba	32	2	NL
Petrogale burbidgei	33	2	NL
Hipposideros cervinus	34	2	NL
Phascogale tapoatafa pirata	35	2	NL
Pseudomys johnsoni	39	2	NL
Macropus bernardus	56	2	NL
Sminthopsis douglasi	**67**	**2**	**EN**
Pseudomys calabyi	69	2	NL
Antechinus leo	70	2	NL
Notomys cervinus	123	2	NL
Dasycercus byrnei	**341**	**2**	**VU**
Burramys parvus	**374**	**2**	NL
Echymipera rufescens	31	3	NL
Myrmecobius fasciatus	**34**	**3**	**VU**
Dobsonia magna	66	3	NL
Onychogalea fraenata	**69**	**3**	**EN**
Sminthopsis psammophila	**33**	**4**	**EN**
Pseudantechinus roryi	44	4	NL
Hipposideros stenotis	55	4	NL
Mesembriomys macrurus	**56**	**4**	**VU**
Lagorchestes hirsutus	**99**	**4**	**VU/EN**
Notomys fuscus	**131**	**4**	**VU**
Petrogale persephone	**133**	**4**	**EN**
Petaurus gracilis	**228**	**4**	**EN**
Antechinus bellus	268	4	NL
Pseudomys laborifex	38	5	NL
Sminthopsis bindi	51	5	NL
Pseudomys pilligaensis	114	5	NL
Pseudantechinus bilarni	120	5	NL
Spilocuscus maculatus	120	5	NL
Zyzomys woodwardi	130	5	NL
Conilurus penicillatus	**156**	**5**	**VU**
Melomys capensis	252	5	NL

Thirty-nine species of mammals had records in five or fewer PAs greater than 1000 hectares, including 13 species listed as threatened (**Table 21**). Again, all of these species have relatively few records available and so are unlikely to be represented in many reserves.

Table 21 Mammal species recorded in five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. Reserves >1000ha	EPBC status
Dasycercus hillieri	**31**	**1**	**EN**
Lagostrophus fasciatus	38	1	NL
Lasiorhinus krefftii	**46**	**1**	**EN**
Zyzomys maini	**64**	**1**	**VU**
Petrogale mareeba	32	2	NL
Petrogale burbidgei	33	2	NL
Hipposideros cervinus	34	2	NL
Phascogale tapoatafa pirata	35	2	NL
Pseudomys johnsoni	39	2	NL
Macropus bernardus	56	2	NL
Sminthopsis douglasi	**67**	**2**	**EN**
Pseudomys calabyi	69	2	NL
Antechinus leo	70	2	NL
Notomys cervinus	123	2	NL
Dasycercus byrnei	341	2	NL
Burramys parvus	374	2	NL
Echymipera rufescens	31	3	NL
Myrmecobius fasciatus	**34**	**3**	**VU**
Hipposideros stenotis	55	3	NL
Dobsonia magna	66	3	NL
Onychogalea fraenata	**69**	**3**	**EN**
Bettongia tropica	**73**	**3**	**EN**
Petrogale persephone	133	3	NL
Sminthopsis psammophila	**33**	**4**	**EN**
Pseudantechinus roryi	44	4	NL
Mesembriomys macrurus	**56**	**4**	**VU**
Lagorchestes hirsutus	**99**	**4**	**VU/EN**
Notomys fuscus	**131**	**4**	**VU**
Petaurus gracilis	**228**	**4**	**EN**
Antechinus bellus	268	4	NL
Pseudomys laborifex	38	5	NL
Sminthopsis bindi	51	5	NL
Petrogale godmani	53	5	NL
Pseudomys pilligaensis	**114**	**5**	NL
Pseudantechinus bilarni	**120**	**5**	NL
Spilocuscus maculatus	120	5	NL
Zyzomys woodwardi	130	5	NL
Conilurus penicillatus	**156**	**5**	**VU**
Melomys capensis	252	5	NL

Reptiles

The ANHAT database has 328007 records for 791 species and subspecies of terrestrial reptiles (data for 26 marine reptiles were excluded). There are currently no recognised extinct terrestrial reptiles.

Fifty-four species account for approximately 50% of the total reptile species records in ANHAT (**Table 22**). These species have over 1400 records each and in the case of the Bynoe's Gecko (*Heteronotia binoei*), over 9200 records.

Table 22 Reptile species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% Records
Heteronotia binoei	9211	2.82
Crocodylus porosus	8754	2.68
Lampropholis delicata	7474	2.28
Lampropholis guichenoti	7322	2.24
Varanus varius	6403	1.96
Gehyra variegata	5572	1.70
Menetia greyii	5176	1.58
Morethia boulengeri	4627	1.41
Ctenotus robustus	4068	1.24
Tiliqua scincoides	3994	1.22
Pseudechis porphyriacus	3857	1.18
Cryptoblepharus plagiocephalus	3792	1.16
Tiliqua rugosus	3763	1.15
Physignathus lesueurii	3424	1.05
Pseudonaja textilis	3399	1.04
Morelia spilota	3397	1.04
Cryptoblepharus virgatus	3320	1.01
Pogona barbata	3284	1.00
Varanus gouldii	3120	0.95
Amphibolurus muricatus	2787	0.85
Ctenotus taeniolatus	2773	0.85
Lialis burtonis	2757	0.84
Eulamprus quoyii	2710	0.83
Carlia munda	2677	0.82
Dendrelaphis punctulata	2466	0.75
Rhynchoedura ornata	2156	0.66
Ctenophorus nuchalis	2136	0.65
Lerista muelleri	2120	0.65
Eulamprus heatwolei	2113	0.65
Lerista bougainvillii	2106	0.64
Gehyra dubia	2101	0.64
Morethia obscura	2062	0.63
Christinus marmoratus	2047	0.63
Cryptoblepharus carnabyi	2009	0.61
Ctenotus schomburgkii	2007	0.61

Pogona vitticeps	1970	0.60
Diplodactylus vittatus	1880	0.57
Carlia foliorum	1871	0.57
Chelodina longicollis	1866	0.57
Egernia striolata	1858	0.57
Notechis scutatus	1848	0.56
Demansia psammophis	1799	0.55
Pseudonaja nuchalis	1792	0.55
Ctenophorus isolepis	1768	0.54
Saproscincus mustelinus	1760	0.54
Ctenotus pantherinus	1732	0.53
Underwoodisaurus milii	1669	0.51
Ctenophorus pictus	1648	0.50
Amphibolurus nobbi	1603	0.49
Cryptophis nigrescens	1580	0.48
Diporiphora bilineata	1554	0.48
Amphibolurus gilberti	1548	0.47
Ctenophorus fordi	1517	0.46
Hemiergis decresiensis	1463	0.45
Total	163710	50.01

Two hundred and twelve species had 30 or fewer individual site records in the ANHAT database (**Table 23**). Of those species, 15 species are listed as threatened, including one species classified as critically endangered. More than half of these species are present in the north-east quarter of the Australian mainland and none from south-eastern Australia. The majority of species are present in the more open woodland, grassland and shrubland habitats and a number are also dependent on rocky environments, which are typical of northern and dryer parts of Australia. Notably, forest dependent species are relatively under-represented in this list, partly because reptiles do not use these habitats extensively and partly because these areas are well surveyed.

Table 23 Reptile species with 30 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC Status
Chelodina kuchlingi	1	0.0	NW	Wet	100	NL
Ctenotus lancelini	**1**	**0.0**	**SW**	**RH**	**100**	**VU**
Diplodactylus kenneallyi	1	0.0	WCI	WL	100	NL
Glaphyromorphus gracilipes	1	0.0	SW	For, SL	2800	NL
Lerista chalybura	1	100.0	WC	WL	1400	NL
Lerista praefrontalis	1	0.0	NW	WL	100	NL
Lerista talpina	1	0.0	WC	SL?	100	NL
Pseudechis papuanus	1	0.0	Torres St.	Wet	100	NL
Ramphotyphlops aspina	1	0.0	NEI	WL	200	NL
Ramphotyphlops margaretae	1	0.0	IC	?	100	NL
Ramphotyphlops yampiensis	1	0.0	Koolan Is.	WL, SL	200	NL
Saproscincus oriarus	1	100.0	EC	RF, WL	100	NL
Brachyurophis morrisi	2	0.0	NC	WL	200	NL

Cryptophis incredibilis	2	0.0	Prince of Wales Is.	WL	100	NL
Ctenotus ehmanni	2	0.0	NW	WL	400	NL
Diporiphora convergens	2	0.0	NW	WL	200	NL
Egernia douglasi	2	50.0	NW	RH	500	NL
Elseya purvisi	2	0.0	EC	Wet	200	NL
Eulamprus frerei	2	100.0	NE Montane	RF, RH	100	NL
Lepidodactylus pumilus	2	50.0	Torres St.	For	1000	NL
Lerista bunglebungle	2	100.0	NWI	RH	100	NL
Lerista quadrivincula	2	0.0	WC	SL	100	NL
Lerista speciosa	2	0.0	CI	GrL	200	NL
Lucasium alboguttatum	2	0.0	WC-SW	GrL?	7400	NL
Menetia sadlieri	2	100.0	Magnetic Is.	?	300	NL
Ramphotyphlops nema	2	0.0	NC	Gen	200	NL
Ramphotyphlops robertsi	2	100.0	NE	For	100	NL
Ramphotyphlops splendidus	2	100.0	WC	SL	100	NL
Ctenotus aphrodite	3	0.0	NEI	SL, GrL	400	NL
Ctenotus schevilli	3	0.0	NWI	GrL	800	NL
Ctenotus serotinus	3	66.7	CI	DF	300	NL
Ctenotus stuarti	3	100.0	NC	WL	300	NL
Diplodactylus fulleri	3	0.0	WCI	SL	100	NL
Lerista haroldi	3	0.0	WC	WL	500	NL
Lerista robusta	3	0.0	NWI	GrL	300	NL
Lerista viduata	3	0.0	SW	WL	300	NL
Ramphotyphlops howi	3	0.0	NW	Gen	200	NL
Ramphotyphlops minimus	3	33.3	NC	?	800	NL
Aprasia rostrata	**4**	**100.0**	**WC**	**WL, SL**	**1100**	**VU**
Eulamprus tryoni	4	100.0	EC	RF	100	NL
Lerista axillaris	4	50.0	WC	WL	200	NL
Lerista puncticauda	4	50.0	SWI	SL	300	NL
Lerista separanda	4	0.0	NW	SL	300	NL
Simoselaps minimus	4	0.0	NW	SL	300	NL
Strophurus robinsoni	4	25.0	NC	GrL	400	NL
Varanus prasinus	4	0.0	Torres St.	RF, For	600	NL
Cryptagama aurita	5	20.0	NCI	RH	500	NL
Ctenotus zastictus	**5**	**0.0**	**WC**	**GrL**	**300**	**VU**
Lucasium squarrosum	5	60.0	WC-WCI	SL	10200	NL
Morelia carinata	5	100.0	NW	For	400	NL
Oedura filicipoda	5	20.0	NW	RH	500	NL
Ramphotyphlops kimberleyensis	5	60.0	NW	SL	800	NL
Ctenotus yampiensis	6	0.0	NW	?	300	NL
Lerista ingrami	6	0.0	NE	For	200	NL
Menetia koshlandae	6	33.3	NE	RH	400	NL
Strophurus wilsoni	6	16.7	WCI	SL	600	NL
Calyptotis thorntonensis	7	85.7	NE	RF, For	200	NL
Ctenotus angusticeps	**7**	**85.7**	**NW**	**SL, GrL**	**300**	**VU**
Lerista eupoda	7	0.0	WCI	WL	500	NL
Lerista simillima	7	0.0	NWI	SL	500	NL

Lerista yuna	7	14.3	WC	SL	500	NL
Phyllurus championae	7	0.0	NE	RH	300	NL
Ramphotyphlops troglodytes	7	0.0	NW	Undergroun d	600	NL
Suta ordensis	7	0.0	NC	WL	600	NL
Techmarscincus jigurru	7	100.0	NE, Mon	RH	100	NL
Aprasia haroldi	8	0.0	WC	SL	500	NL
Carlia parrhasius	8	0.0	NE	RH	200	NL
Ctenophorus yinnietharra	**8**	**0.0**	**WCI**	**RH**	**400**	**VU**
Ctenotus youngsoni	8	0.0	WC	SL	1000	NL
Delma mitella	**8**	**75.0**	**NE**	**RF, For**	**500**	**VU**
Elseya georgesi	8	50.0	EC	Wet	500	NL
Elseya irwini	8	0.0	NE	Wet	600	NL
Lerista ameles	8	25.0	NE	RH	400	NL
Lerista apoda	8	50.0	NW	WL	700	NL
Lerista arenicola	8	87.5	SC	WL	1000	NL
Lerista elongata	8	0.0	SCI	SL	1200	NL
Lerista kalumburu	8	50.0	NW	WL	400	NL
Lerista stictopleura	8	12.5	WCI	SL	600	NL
Niveoscincus orocryptus	8	87.5	Tas	WL, RH	700	NL
Paroplocephalus atriceps	8	37.5	SWI	WL, SL	800	NL
Tympanocryptis uniformis	8	0.0	NC	WL	1200	NL
Ctenotus agrestis	9	11.1	NWI	GrL	700	NL
Ctenotus monticola	9	11.1	NE	WL	600	NL
Ctenotus terrareginae	9	66.7	NE	RH	600	NL
Lerista storri	9	22.2	NE	WL	700	NL
Lerista walkeri	9	55.6	NW	WL?	1000	NL
Morelia oenpelliensis	9	77.8	NC	RH	800	NL
Ramphotyphlops chamodracaena	9	11.1	NE	WL	900	NL
Ctenotus zebrilla	10	0.0	NW	WL, GrL	800	NL
Egernia pilbarensis	10	20.0	WC	RH	1100	NL
Elseya lavarackorum	**10**	**10.0**	**NC**	**Wet**	**800**	**EN**
Emoia atrocostata	10	20.0	NE	Man, RH	900	NL
Gehyra baliola	10	30.0	Torres St.	WL, Man	1100	NL
Varanus kingorum	10	10.0	NC	RH	900	NL
Carlia rococo	11	63.6	NE	RH	800	NL
Ctenotus pallescens	11	0.0	NC	WL, GrL	1100	NL
Gehyra keep river	11	0.0	WC	RH	800	NL
Lerista vittata	**11**	**9.1**	**NE**	**SL**	**500**	**VU**
Phyllurus isis	11	63.6	NE	RF	200	NL
Pogona microlepidota	11	54.5	NW	WL, RH	1200	NL
Ramphotyphlops broomi	11	9.1	NE	WL	2000	NL
Ramphotyphlops ganei	11	9.1	WCI	WL	700	NL
Ramphotyphlops yirrikalae	11	63.6	NC	WL	900	NL
Ctenotus astictus	12	0.0	NC	WL, SL	800	NL
Ctenotus colletti	12	41.7	NW	SL	1200	NL
Ctenotus mastigura	12	41.7	NW	WL, GrL	2400	NL
Ctenotus nigrilineatus	12	66.7	NW	GrL	400	NL
Ctenotus quinkan	12	8.3	NE	RH	600	NL

Egernia obiri	12	66.7	NC	RH	900	NL
Lerista humphriesi	12	25.0	WC	SL	900	NL
Pseudothecadactylus cavaticus	12	58.3	NW	RH	900	NL
Strophurus mcmillani	12	25.0	NW	GrL	1300	NL
Vermicella snelli	12	16.7	NW	For, WL	1400	NL
Chelodina novaeguineae	13	7.7	NC	Wet	2900	NL
Delma labialis	**13**	**23.1**	**NE**	**For**	**1300**	**VU**
Emydura subglobosa	13	23.1	N	Wet	1200	NL
Lampropholis elongata	13	38.5	EC, Mon	WL	200	NL
Lerista allochira	13	61.5	WC	RH	800	NL
Lerista flammicauda	13	38.5	WCI	GrL	1600	NL
Pseudemoia baudini	13	53.8	SC	SL	1700	NL
Carlia scirtetis	14	42.9	NE	RH	200	NL
Elapognathus minor	14	71.4	SW	For, GrL	2300	NL
Ephalophis greyae	14	0.0			2200	NL
Eulamprus luteilateralis	14	57.1	NE, Mon	RF	900	NL
Lerista carpentariae	14	14.3	NC	WL	1300	NL
Lerista colliveri	14	28.6	NE	WL, RH	1200	NL
Orraya occultus	14	0.0	NE	RF	500	NL
Ramphotyphlops pilbarensis	14	42.9	NC	SL	1300	NL
Aprasia smithi	15	13.3	WC	WL, SL	1200	NL
Egernia montana	15	53.3	SE	For, RH		NL
Furina barnardi	15	26.7	NE	WL, RH	2300	NL
Lampropholis colossus	15	80.0	EC	RF	300	NL
Nactus galgajuga	15	86.7	NE	RH	200	NL
Nephrurus deleani	15	0.00	SCI	GrL?	1600	NL
Notoscincus butleri	15	0.0	NW	GrL	1200	NL
Ophidiocephalus taeniatus	**15**	**6.7**	**SCI**	**WL**	**1100**	**VU**
Carlia aeratus	16	37.5	NE	WL, GrL	5000	NL
Cyclodomorphus branchialis	16	31.2	WC	SL	11300	NL
Elseya belli	**16**	**12.5**	**EC**	**Wet**	**900**	**VU**
Lampropholis mirabilis	16	62.5	NE	RF-RH	1000	NL
Lerista aericeps	16	68.7	CI	GrL	6000	NL
Vermicella vermiformis	16	31.2	NC-NCI	WL	900	NL
Lerista kennedyensis	17	88.2	WCI	WL, GrL	500	NL
Lerista tridactyla	17	5.9	SWI	WL	1500	NL
Nangura spinosa	**17**	**47.1**	**EC**	**For**	**700**	**CE**
Ctenophorus mckenziei	18	55.6	SC	WL	1000	NL
Emydura australis	18	33.3	NW	Wet	2800	NL
Eugongylus rufescens	18	27.8	NE	For	1900	NL
Lerista onsloviana	18	33.3	WC	SL	1600	NL
Lucasium wombeyi	18	27.8	WCI	?	2600	NL
Strophurus rankini	18	5.6	WC	SL	1900	NL
Varanus keithhornei	18	55.6	NE	RF	1000	NL
Acrochordus granulatus	19	5.3	N	Wet	3000	NL
Cryptoblepharus fuhni	19	100.0	NE	RH	400	NL
Lerista vermicularis	19	5.3	NWI	GrL?	1500	NL
Lerista wilkinsi	19	21.0	NEI	WL?	800	NL
Morelia viridis	19	73.7	NE	RF	600	NL
Anomalopus gowi	20	20.0	NW	WL	2000	NL

Ctenotus rubicundus	20	40.0	WC	GrL	1900	NL
Saproscincus spectabilis	20	65.0	SE	RF	1800	NL
Varanus pilbarensis	20	15.0	NCI	RH	1800	NL
Aprasia fusca	21	4.8	WC	SL	1100	NL
Diporiphora superba	21	42.9	NE	SL	2900	NL
Glaphyromorphus brongersmai	21	19.0	NW	WL	900	NL
Glaphyromorphus mjobergi	21	57.1	NE	RF	2200	NL
Lerista cinerea	21	0.0	NE	WL, RH	1200	NL
Oedura obscura	21	23.8	NW	RH	3000	NL
Antairoserpens warro	22	9.1	NE	For, WL	13500	NL
Carlia tanneri	22	9.1	NE	RF	1200	NL
Ctenotus burbidgei	22	27.3	NW	RH	2100	NL
Diporiphora reginae	22	0.0	SWI	GrL	1400	NL
Egernia guthega	22	86.4	SE, Mon	WL, GrL		NL
Pseudemydura umbrina	**22**	**59.1**	**SW**	**Wet**	**400**	**CE**
Ctenotus gagudju	23	82.6	NC	WL	1100	NL
Ctenotus striaticeps	23	17.4	NC	GrL	2200	NL
Delma elegans	23	26.1	WCI	GrL	2100	NL
Glaphyromorphus pumilus	23	13.0	NE	WL, RF, RH	3700	NL
Anomalopus mackayi	**24**	**4.2**	**CEI**	**WL, GrL**	**1800**	**VU**
Ctenotus alleni	24	50.0	WC	WL	1400	NL
Ctenotus nullum	24	33.3	NE	RH	1400	NL
Demansia simplex	24	33.3	NC	WL	1900	NL
Diporiphora valens	24	20.8	WCI	WL, SL	1700	NL
Egernia hosmeri	24	4.2	NE-NEI	RH	3300	NL
Furina dunmalli	**24**	**29.2**	**NC**	**For, WL**	**2500**	**VU**
Ramphotyphlops leptosoma	24	20.8	WC	WL	2000	NL
Vermicella intermedia	24	8.3	NW-NC	For, WL	1900	NL
Ctenophorus maculosus	25	80.0	SCI	SaL	2500	NL
Ctenotus arnhemensis	25	76.0	NC	For, WL	1500	NL
Ctenotus astarte	25	12.0	NWI	SL	2700	NL
Diplodactylus mitchelli	25	16.0	WC	RH	1300	NL
Menetia concinna	25	80.0	NC	WL	1300	NL
Myron richardsonii	25	28.0	NC	Man	2200	NL
Phyllurus ossa	25	24.0	NE	RF	1200	NL
Ramphotyphlops pinguis	25	8.0	SW	For, WL	4400	NL
Saproscincus lewisi	25	84.0	NE	RF	900	NL
Strophurus michaelseni	25	48.0	WC	WL, GrL	1900	NL
Diplodactylus klugei	26	19.2	WC	SL	2000	NL
Niveoscincus greeni	26	88.5	Tas, Mon	Wet	1400	NL
Vermicella multifasciata	26	15.4	NC	WL	3400	NL
Ctenotus maryani	27	25.9	WC	GrL	1700	NL
Emoia longicauda	27	44.4	NE	RF	2600	NL
Lerista christinae	27	48.1	SW	WL	1000	NL
Lerista taeniata	27	33.3	CI	GrL	2500	NL
Pseudechis butleri	27	7.4	WCI	WL, SL	3100	NL
Ctenophorus tjantjalka	28	10.7	SCI	RH	2400	NL
Phyllurus caudiannulatus	28	46.4	EC	RF	500	NL
Lerista stylis	29	100.0	NC	WL	1200	NL

Ramphotyphlops silvia	29	79.3	EC	RF, WL	1400	NL
Tympanocryptis houstoni	29	79.3	SW-SC	SL	3200	NL
Varanus primordius	29	31.0	NC	WL, RH	1900	NL
Ctenotus rutilans	30	6.7	WC	GrL	2100	NL
Rhinoplocephalus bicolor	30	56.7	SW	SL	4100	NL

Removal of poorly recorded species leaves 325282 records in ANHAT for 579species (and subspecies). The mean number of records per species for species with greater than 30 records was 561.8, with the mean of 32.4 for the percent of records in the NRS.

One hundred and twenty three species of reptiles had 45% or greater of individual site records located within PAs (**Table 24**). Of those 123 species, three species are listed as threatened, including one species listed as endangered. Many species in this group of species are from north-western and northern Australia, but there are also many species present in south-eastern Australia and north-eastern Australia. Compared to the species with few records, a number of species in this highly reserved group occupy rainforest and forest habitats. Woodlands are still the most prevalent habitats used and rocky environments remain of some importance in regards to the types of species present in the table, reflecting the relatively strong use that reptiles make of rocks. No reptile species has all of its records from within reserves, but *Coggeria naufragus* from Fraser Island has over 98% of its records within the reserve system.

Table 24 Reptile species with >45% of site records within PAs.

Species	No. Records	Records in NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Eulamprus tenuis	870	392	45.1	E	Gen	51500	NL
Ctenotus regius	1450	654	45.1	SCI-SEI	WL, SL	85100	NL
Pseudemoia entrecasteauxii	1362	615	45.1	SE	Gen	70500	NL
Ctenotus ariadnae	108	49	45.4	I	GrL	6300	NL
Carlia laevis	46	21	45.6	NE	RF	4200	NL
Morethia storri	542	248	45.8	NW, NC	WL, SL	22300	NL
Glaphyromorphus darwiniensis	403	185	45.9	NC	For, WL	14500	NL
Drysdalia coronoides	880	404	45.9	SW, Tas	WL, GrL	54500	NL
Lerista punctatovittata	917	422	46.0	SEI	WL, SL, GrL	57000	NL
Oedura tryoni	673	311	46.2	EC	For, WL, RH	36300	NL
Ctenotus labillardieri	293	136	46.4	SW	For, RH	17900	NL
Diplodactylus granariensis	810	376	46.4	SW-SC	WL	45000	NL
Lerista bougainvillii	2106	982	46.6	SE, Tas	For, WL	84200	NL
Lerista microtis	107	50	46.7	SW-SC	For, WL	7900	NL
Rankinia adelaidensis	318	149	46.9	WC-SC	SL	17900	NL
Varanus mitchelli	142	67	47.2	NC	Wet	10600	NL
Ctenophorus cristatus	516	244	47.3	SW-SC	WL	40600	NL

Hoplocephalus stephensii	269	128	47.6	SE	RF, For	19100	NL
Saiphos equalis	1187	565	47.6	EC	RF, For, WL	53200	NL
Acritoscincus platynotum	136	65	47.8	SE, Mon	WL, GrL	40000	NL
Phyllurus nepthys	46	22	47.8	NE	RF	1100	NL
Egernia saxatilis	301	144	47.8	SE	WL, RH	26100	NL
Calyptotis scutirostrum	1135	543	47.8	EC	RF, For	30500	NL
Notechis scutatus ater	**359**	**172**	**47.9**	**SC**	**Gen**	**36800**	**VU**
Ctenotus taeniolatus	2773	1329	47.9	E	WL, RH	127700	NL
Lampropholis amicula	347	167	48.1	EC	For, SL	20400	NL
Ctenotus essingtonii	966	465	48.1	NC-NE	For, WL, SL	28900	NL
Glaphyromorphus isolepis	735	354	48.2	N	Wet, GrL	43100	NL
Strophurus intermedius	732	354	48.4	WCI-SEI	WL, SL	40100	NL
Strophurus assimilis	93	45	48.4	SWI, SC	SL	6900	NL
Lerista dorsalis	358	175	48.9	SC	WL, SL	32500	NL
Pseudemoia cryodroma	90	44	48.9	SE, Montane	WL, GrL	2700	NL
Cyrtodactylus louisiadensis	49	24	49.0	NE	RF, RH	3200	NL
Lampropholis couperi	98	48	4.90	EC	RF	4800	NL
Brachyurophis australis	424	208	49.1	E	WL, SL, GrL	34400	NL
Egernia frerei	512	252	49.2	NE-EC	RF, For, WL	26100	NL
Ramphotyphlops bituberculatus	617	307	49.8	S	Gen	52400	NL
Anomalopus brevicollis	62	31	50.0	EC	For, WL	3900	NL
Eroticoscincus graciloides	106	53	50.0	EC	RF, For	5600	NL
Pygopus lepidopodus	776	392	50.5	S, NE	For, WL, SL	70300	NL
Proablepharus reginae	114	58	50.9	WI-CI	GrL	7800	NL
Varanus glebopalma	124	64	51.6	NC	RH	10600	NL
Hoplocephalus bungaroides	**91**	**47**	**51.6**	**SE**	**WL, RH**	**7000**	**VU**
Egernia inornata	866	448	51.7	SI	SL, GrL		NL
Saproscincus rosei	140	73	52.1	EC	RF	13100	NL
Saltuarius salebrosus	63	33	52.4	NE	RF, RH	4400	NL
Ctenophorus decresii	232	124	53.4	SC	RH	14000	NL
Delma butleri	447	239	53.5	W-SEI	GrL	31500	NL
Lerista edwardsae	166	89	53.6	SC	WL	17100	NL
Parasuta nigriceps	435	236	54.2	SW, SC	RH	32000	NL
Anomalopus pluto	35	19	54.3	NE	For	1200	NL
Amphibolurus nobbi	1603	880	54.9	E	For, WL	82100	NL
Chelosania brunnea	49	27	55.1	NC	WL	4600	NL
Morethia obscura	2062	1138	55.2	SW-SEI	WL, SL	102900	NL
Phyllurus platurus	548	305	55.7	SE	RH	20100	NL
Carlia amax	1427	795	55.7	NC	RH	50200	NL

Cryptoblepharus litoralis	127	71	55.9	NC-NE	RH	13900	NL
Carlia gracilis	967	545	56.4	NW	For	30000	NL
Ctenotus catenifer	69	39	56.5	SW	SL	5600	NL
Egernia pulchra	44	25	56.8	SW	For, WL		NL
Delma australis	813	462	56.8	SW-SEI	SL-GrL	51200	NL
Eulamprus tigrinus	35	20	57.1	NE	RF, SL	3100	NL
Ctenotus arcanus	143	82	57.3	EC	For, WL	6500	NL
Menetia alanae	179	103	57.5	NC	For, WL	7100	NL
Varanus baritji	50	29	58.0	NC	RH	4100	NL
Egernia mcpheei	158	92	58.2	EC	For, RH	12100	NL
Lerista varia	36	21	58.3	WC	SL	2200	NL
Egernia richardi	96	56	58.3	SW-SC	WL, RH	9300	NL
Rankinia diemensis	982	575	58.5	SE, Tas	For, WL	37100	NL
Lerista karlschmidti	92	54	58.7	NC, NE	WL, SL	5100	NL
Ramphotyphlops tovelli	39	23	59.0	NC	WL	2200	NL
Drysdalia rhodogaster	61	36	59.0	SE	For, WL	5000	NL
Hypsilurus spinipes	313	185	59.1	EC	RF, For	12800	NL
Ctenotus atlas	486	289	59.5	SI	WL	29000	NL
Ctenophorus pictus	1648	984	59.7	SI-CI	SL, GrL	98300	NL
Carlia rubrigularis	328	196	59.8	NE	RF	13900	NL
Saltuarius swaini	254	153	60.2	EC	RF	13200	NL
Ophioscincus truncatus	257	155	60.3	EC	RF, For, WL	9500	NL
Egernia whitii	1389	844	60.8	SE, Tas	For, WL		NL
Saproscincus basiliscus	189	116	61.4	NE	RF	11500	NL
Lampropholis coggeri	161	99	61.5	NE	RF	9500	NL
Ctenotus orientalis	530	326	61.5	S	WL, SL	28000	NL
Coeranoscincus frontalis	39	24	61.5	NE	RF	2900	NL
Gnypetoscincus queenslandiae	222	137	61.7	NE	RF	8300	NL
Hypsilurus boydii	89	55	61.8	NE	RF	5700	NL
Oedura lesueurii	936	594	63.5	SE	For, WL, RH	36000	NL
Lampropholis caligula	37	24	64.9	SE	GrL	1600	NL
Saltuarius cornutus	142	93	65.5	NE	RF	8400	NL
Ctenotus vertebralis	206	136	66.0	NC	WL	7900	NL
Egernia multiscutata	228	151	66.2	SW, SC	Wl, SL		NL
Ctenotus storri	106	71	67.0	NC	WL, GrL	4400	NL
Gehyra pamela	67	45	67.2	NC	RH	4100	NL
Ctenophorus fordi	1517	1019	67.2	SI	WL, GrL	54100	NL
Calyptotis lepidorostrum	191	129	67.5	EC	RF, For	8000	NL
Diporiphora linga	35	24	68.6	SC	WL, GrL	3300	NL
Aprasia inaurita	271	189	69.7	SC	WL	14700	NL
Drysdalia mastersii	162	113	69.7	SC	WL, GrL	10100	NL
Carettochelys insculpta	40	28	70.0	NC	Wet	2500	NL

Amphibolurus norrisi	317	222	70.0	S	WL	14300	NL
Eulamprus murrayi	552	387	70.1	EC	For, WL	19600	NL
Cyclodomorphus praealtus	**73**	**52**	**71.2**	**SE, Mon**	**WL, GrL**	**1100**	**EN**
Saproscincus tetradactylus	60	44	73.3	NE	RF	4500	NL
Ctenotus brachyonyx	473	347	73.4	SEI	WL, SL	15900	NL
Saproscincus challengeri	482	355	73.6	EC	For	15200	NL
Pseudothecadactylus lindneri	43	32	74.4	NC	RH	3000	NL
Anomalopus swansoni	60	45	75.0	SE	For, WL	4200	NL
Lampropholis robertsi	45	34	75.6	NE, Mon	RF	2000	NL
Nephrurus stellatus	117	89	76.1	SWI-SC	SL, GrL	9600	NL
Harrisoniascincus zia	58	45	77.6	EC, Mon	RF	3200	NL
Saproscincus czechurai	95	74	77.9	NE	RF	4800	NL
Coeranoscincus reticulatus	132	103	78.0	EC	RF, For	5100	NL
Glaphyromorphus fuscicaudis	74	60	81.1	NE	RF	4900	NL
Ctenotus coggeri	91	74	81.3	NC	RH	4300	NL
Aprasia aurita	73	60	82.2	SEI	WL, GrL	900	NL
Saltuarius wyberba	42	35	83.3	EC	RH	600	NL
Ophioscincus cooloolensis	63	53	84.1	EC	RF, WL	2200	NL
Carphodactylus laevis	66	56	84.8	NE	RF	3600	NL
Eulamprus kosciuskoi	268	233	86.9	SE, Mon	Wet	10600	NL
Oedura gemmata	58	53	91.4	NC	RH	2200	NL
Ctenotus xenopleura	35	32	91.4	SWI	GrL	1200	NL
Niveoscincus microlepidotus	35	32	91.4	Tas, Mon	SL	2500	NL
Ctenotus kurnbudj	34	33	97.1	NC	WL	700	NL
Coggeria naufragus	55	54	98.2	Fraser Is.	For, SL	900	NL

Forty-six reptile species had less than 10% of ANHAT records located within the NRS. Four of the 46 species are classified as threatened, including two endangered species. Notably, seven species have no records within an IUCN classified PA, indicating they are poorly protected from land-use changes. These species come from northern and western Australia, but are scattered relatively widely. There are few evident geographic trends in regards to the location of all of the identified poorly reserved species. None of the species in the table come from south-eastern Australia or Tasmania, but there are several from most other areas. In regards to habitat preferences, few species use rainforest or forest, indicative of the relatively high levels or reservation of these habitats. The open woodlands, grasslands and shrublands are again the typical habitats of these poorly reserved species, with rock being of some importance.

Table 25 Reptile species with <10% of ANHAT records located within the NRS.

Species	Records	In PAs	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Gehyra robusta	33	0	0.0	NC	RH	3200	NL
Lerista nichollsi	34	0	0.0	WCI	SL	3900	NL
Elusor macrurus	**37**	**0**	**0.0**	**NC**	**Wet**	**1300**	**EN**
Ctenotus rawlinsoni	39	0	0.0	NE	SL	500	NL
Lerista neander	39	0	0.0	WCI	GrL	3400	NL
Pseudechis colletti	74	0	0.0	NEI	GrL	6200	NL
Strophurus taeniatus	78	0	0.0	NI	GrL	6600	NL
Tiliqua adelaidensis	**1087**	**6**	**0.5**	**SC**	**GrL**	**1700**	**EN**
Ctenophorus gibba	45	1	2.2	SCI	RH	6100	NL
Rheodytes leukops	**41**	**1**	**2.4**	**EC**	**Wet**	**2400**	**VU**
Pseudonaja guttata	204	5	2.4	NEI	GrL	17300	NL
Ctenotus tanamiensis	38	1	2.6	CI	GrL	1500	NL
Ramphotyphlops affinis	34	1	2.9	EC	WL	3900	NL
Tympanocryptis centralis	31	1	3.2	NCI-CI	RH	3100	NL
Carlia coensis	52	2	3.8	NE	RH	1600	NL
Ctenotus rimacola	96	4	4.2	NC	GrL	4300	NL
Pogona henrylawsoni	45	2	4.4	NEI	GrL	3700	NL
Denisonia maculata	**106**	**5**	**4.7**	**NE**	**Gen**	**6500**	**VU**
Oxyuranus microlepidotus	78	4	5.1	SEI	GrL?	5300	NL
Ctenotus greeri	95	5	5.3	CI	WL, GrL	6500	NL
Lerista ips	37	2	5.4	NWI	GrL	3000	NL
Ctenotus militaris	35	2	5.7	NW	WL	2400	NL
Varanus spenceri	98	6	6.1	NEI	GrL	7900	NL
Delma pax	94	6	6.4	WC	GrL	9700	NL
Pygopus steelescotti	31	2	6.4	NC	WL	2700	NL
Neelaps bimaculatus	76	5	6.6	SW, SCI	WL, SL	6800	NL
Fordonia leucobalia	74	5	6.8	N	Man	5700	NL
Ctenotus eutaenius	59	4	6.8	NE	WL	3600	NL
Denisonia devisi	265	19	7.2	ECI	WL, SL	23100	NL
Suta punctata	305	23	7.5	NW-NC	WL, GrL	26200	NL
Chelodina steindachneri	52	4	7.7	WC	Wet	6100	NL

Neelaps calonotus	52	4	7.7	SW	WL, SL	3500	NL
Hemiergis quadrilineatum	212	17	8.0	SW	WL	6100	NL
Gehyra minuta	37	3	8.1	NC	RH	2700	NL
Ctenotus olympicus	235	20	8.5	SCI	SL	18300	NL
Hoplocephalus bitorquatus	290	25	8.6	NE-EC	For, WL	36300	NL
Cacophis harriettae	436	39	8.9	EC	For	23900	NL
Carlia rimula	32	3	9.4	NE	RH	1600	NL
Lerista gascoynensis	32	3	9.4	WC	SL	1700	NL
Tympanocryptis intima	234	22	9.4	CI	RH	26100	NL
Delma grayii	53	5	9.4	SW	WL	5500	NL
Aspidites ramsayi	185	18	9.7	I	WL, SL	20900	NL
Cryptophis boschmai	202	20	9.9	NE	For, WL	15500	NL
Pseudonaja ingrami	40	4	10.0	NCI	GrL	4600	NL
Diporiphora pindan	60	6	10.0	NW	WL	5100	NL
Lerista uniduo	310	31	10.0	WC	SL	12500	NL

A total of 60 reptile species had records in more than 100 separate PAs. Fifty-five species in this list had over 1000 records, with an average of 2613 records per species. No species are listed as threatened.

Table 26 Reptile species recorded at more than 100 PAs.

Species	No. Records	No. Reserves	No. reserves >1000ha	EPBC status
Pseudonaja nuchalis	1792	100	90	NL
Hemiaspis signata	620	100	80	NL
Delma australis	813	100	86	NL
Rhynchoedura ornata	2156	100	96	NL
Carlia vivax	1009	101	79	NL
Pogona vitticeps	1970	102	93	NL
Diplodactylus granariensis	810	102	76	NL
Pseudemoia entrecasteauxii	1362	105	80	NL
Eulamprus heatwolei	2113	111	95	NL
Varanus tristis	1147	114	99	NL
Pseudechis australis	1460	114	104	NL
Eulamprus tenuis	870	121	98	NL
Saiphos equalis	1187	122	91	NL
Pogona minor	1341	127	103	NL
Ctenotus schomburgkii	2007	132	114	NL
Boiga irregularis	1278	137	108	NL

Acritoscincus duperreyi	1327	138	75	NL
Saproscincus mustelinus	1760	139	106	NL
Cryptoblepharus carnabyi	2009	143	113	NL
Gehyra dubia	2101	144	13	NL
Amphibolurus nobbi	1603	147	128	NL
Lerista muelleri	2120	149	129	NL
Hemiergis peronii	1019	149	90	NL
Egernia striolata	1858	149	118	NL
Hemiergis decresiensis	1463	150	72	NL
Pygopus lepidopodus	776	150	124	NL
Carlia foliorum	1871	153	120	NL
Chelodina longicollis	1866	155	103	NL
Egernia whitii	1389	163	111	NL
Diplodactylus vittatus	1880	168	137	NL
Notechis scutatus	1848	175	127	NL
Underwoodisaurus milii	1669	181	153	NL
Dendrelaphis punctulata	2466	185	148	NL
Morelia spilota	3397	209	161	NL
Cryptoblepharus plagiocephalus	3792	210	171	NL
Demansia psammophis	1799	210	173	NL
Lerista bougainvillii	2106	210	120	NL
Cryptophis nigrescens	1580	212	167	NL
Ctenotus taeniolatus	2773	213	167	NL
Eulamprus quoyii	2710	214	167	NL
Morethia obscura	2062	225	156	NL
Pogona barbata	3284	235	156	NL
Tiliqua scincoides	3994	236	163	NL
Christinus marmoratus	2047	236	141	NL
Physignathus lesueuri	3424	247	185	NL
Cryptoblepharus virgatus	3320	250	185	NL
Varanus gouldii	3120	254	211	NL
Amphibolurus muricatus	2787	259	185	NL
Morethia boulengeri	4627	276	199	NL
Gehyra variegate	5572	279	233	NL
Lialis burtonis	2757	281	250	NL
Pseudonaja textilis	3399	285	198	NL
Tiliqua rugosus	3763	303	194	NL
Pseudechis porphyriacus	3857	318	242	NL
Ctenotus robustus	4068	325	233	NL
Heteronotia binoei	9211	369	322	NL
Menetia greyii	5176	372	267	NL
Lampropholis guichenoti	7322	425	244	NL
Lampropholis delicata	7474	426	297	NL
Varanus varius	6403	458	328	NL

A total of 113 species had records in five or fewer PAs (Table 27), covering a very diverse set of taxa. Four species are listed as threatened, including three species classified as endangered. The majority of species in this list have fewer than 100 individual site records and only one has more than 250 site records. The pygmy blue-tongue (*Tiliqua adelaidensis*)

had over 1000 records, but is a well studied species currently with a very restricted distribution.

Table 27 Reptile species recorded from five or fewer PAs.

Species	No. Records	No. reserves	EPBC status
Lerista zietzi	31	1	NL
Pygopus steelescotti	31	1	NL
Tympanocryptis centralis	31	1	NL
Carlia rimula	32	1	NL
Ramphotyphlops affinis	34	1	NL
Ctenotus militaris	35	1	NL
Ctenotus tanamiensis	38	1	NL
Gehyra borroloola	38	1	NL
Carettochelys insculpta	40	1	NL
Ctenotus rosarium	40	1	NL
Rheodytes leukops	**41**	**1**	**VU**
Pseudothecadactylus lindneri	43	1	NL
Brachyurophis approximans	44	5	NL
Ctenophorus gibba	45	1	NL
Pogona henrylawsoni	45	1	NL
Phyllurus nepthys	46	1	NL
Carlia coensis	52	1	NL
Coggeria naufragus	55	1	NL
Eulamprus leuraensis	**90**	**1**	**EN**
Tiliqua adelaidensis	**1087**	**1**	**EN**
Egernia slateri	32	2	NL
Ctenotus kurnbudj	34	2	NL
Anomalopus pluto	35	2	NL
Varanus semiremex	36	2	NL
Gehyra minuta	37	2	NL
Lerista ips	37	2	NL
Ctenophorus rufescens	42	2	NL
Saltuarius wyberba	42	2	NL
Lerista lineata	43	2	NL
Oedura gemmata	58	2	NL
Diporiphora pindan	60	2	NL
Ophioscincus cooloolensis	63	2	NL
Tympanocryptis pinguicolla	**64**	**2**	**EN**
Gehyra pamela	67	2	NL
Aprasia aurita	73	2	NL
Cyclodomorphus praealtus	73	2	NL
Ctenotus coggeri	91	2	NL
Ctenotus rimacola	96	2	NL
Varanus spenceri	98	2	NL
Pseudonaja guttata	204	2	NL
Carlia zuma	32	3	NL
Lerista gascoynensis	32	3	NL
Diplodactylus savagei	38	3	NL

Christinus alexanderi	39	3	NL
Lerista zonulata	40	3	NL
Ctenotus capricorni	41	3	NL
Lerista baynesi	41	3	NL
Gehyra xenopus	42	3	NL
Lerista emmotti	43	3	NL
Pogona nullarbor	44	3	NL
Lerista greeri	46	3	NL
Calyptotis temporalis	52	3	NL
Neelaps calonotus	52	3	NL
Fordonia leucobalia	74	3	NL
Oxyuranus microlepidotus	78	3	NL
Delma haroldi	83	3	NL
Strophurus wellingtonae	86	3	NL
Ctenotus nasutus	87	3	NL
Lerista karlschmidti	92	3	NL
Ctenotus storri	106	3	NL
Denisonia maculata	106	3	NL
Ctenotus joanae	200	3	NL
Ctenotus vertebralis	206	3	NL
Lepidodactylus lugubris	32	4	NL
Oedura gracilis	34	4	NL
Ctenotus xenopleura	35	4	NL
Diporiphora linga	35	4	NL
Lerista varia	36	4	NL
Lampropholis caligula	37	4	NL
Ramphotyphlops tovelli	39	4	NL
Demansia calodera	40	4	NL
Pseudonaja ingrami	40	4	NL
Ctenotus rufescens	42	4	NL
Rankinia parviceps	43	4	NL
Ctenotus delli	46	4	NL
Lerista borealis	50	4	NL
Varanus baritji	50	4	NL
Chelodina steindachneri	52	4	NL
Cerberus rhynchops	55	4	NL
Eulamprus amplus	57	4	NL
Varanus indicus	58	4	NL
Carlia dogare	59	4	NL
Ctenotus eutaenius	59	4	NL
Egernia kintorei	65	4	NL
Ramphotyphlops guentheri	65	4	NL
Lerista kendricki	69	4	NL
Ctenotus septenarius	70	4	NL
Delma pax	94	4	NL
Pseudothecadactylus australis	98	4	NL
Ctenophorus rubens	119	4	NL
Ctenophorus vadnappa	132	4	NL
Cyclodomorphus venustus	42	5	NL
Gehyra occidentalis	42	5	NL

Lerista petersoni	42	5	NL
Glaphyromorphus cracens	45	5	NL
Caimanops amphiboluroides	46	5	NL
Cyrtodactylus louisiadensis	49	5	NL
Delma grayii	53	5	NL
Ctenotus tantillus	54	5	NL
Anomalopus swansoni	60	5	NL
Ramphotyphlops centralis	61	5	NL
Ctenotus serventyi	65	5	NL
Saproscincus hannahae	67	5	NL
Ctenotus iapetus	70	5	NL
Lerista picturata	70	5	NL
Strophurus jeanae	75	5	NL
Neelaps bimaculatus	76	5	NL
Ramphotyphlops ammodytes	76	5	NL
Pseudemoia cryodroma	90	5	NL
Ctenotus greeri	95	5	NL
Ctenotus pulchellus	101	5	NL
Acanthophis pyrrhus	117	5	NL
Menetia alanae	179	5	NL

One hundred and nineteen species of reptiles had records in five or fewer PAs greater than 1000 hectares, including three species listed as vulnerable.

Table 28 Reptile species recorded in five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. Reserves >1000ha	EPBC status
Lerista zietzi	31	1	NL
Pygopus steelescotti	31	1	NL
Tympanocryptis centralis	31	1	NL
Lepidodactylus lugubris	32	1	NL
Carlia rimula	32	1	NL
Ctenotus militaris	35	1	NL
Ctenotus tanamiensis	38	1	NL
Ctenotus rosarium	40	1	NL
Carettochelys insculpta	40	1	NL
Pseudothecadactylus lindneri	43	1	NL
Pogona henrylawsoni	45	1	NL
Ctenophorus gibba	45	1	NL
Phyllurus nepthys	46	1	NL
Carlia coensis	52	1	NL
Coggeria naufragus	55	1	NL
Eulamprus leuraensis	90	1	NL
Gehyra catenata	398	1	NL
Egernia slateri	32	2	NL
Carlia zuma	32	2	NL
Ctenotus kurnbudj	34	2	NL
Anomalopus pluto	35	2	NL

Varanus semiremex	36	2	NL
Gehyra minuta	37	2	NL
Lerista ips	37	2	NL
Gehyra borroloola	38	2	NL
Ctenophorus rufescens	42	2	NL
Saltuarius wyberba	42	2	NL
Neelaps calonotus	52	2	NL
Oedura gemmata	58	2	NL
Diporiphora pindan	60	2	NL
Ophioscincus cooloolensis	63	2	NL
Gehyra pamela	67	2	NL
Aprasia aurita	73	2	NL
Cyclodomorphus praealtus	73	2	NL
Fordonia leucobalia	74	2	NL
Ctenotus coggeri	91	2	NL
Ctenotus rimacola	96	2	NL
Varanus spenceri	98	2	NL
Pseudonaja guttata	204	2	NL
Hemiergis quadrilineatum	212	2	NL
Lerista gascoynensis	32	3	NL
Lerista varia	36	3	NL
Diplodactylus savagei	38	3	NL
Christinus alexanderi	39	3	NL
Pseudonaja ingrami	40	3	NL
Demansia calodera	40	3	NL
Lerista zonulata	40	3	NL
Ctenotus capricorni	41	3	NL
Lerista baynesi	41	3	NL
Gehyra xenopus	42	3	NL
Lerista emmotti	43	3	NL
Pogona nullarbor	44	3	NL
Lerista greeri	46	3	NL
Cyrtodactylus louisiadensis	49	3	NL
Lerista borealis	50	3	NL
Calyptotis temporalis	52	3	NL
Carlia dogare	59	3	NL
Oxyuranus microlepidotus	78	3	NL
Delma haroldi	83	3	NL
Strophurus wellingtonae	86	3	NL
Ctenotus nasutus	87	3	NL
Lerista karlschmidti	92	3	NL
Denisonia maculata	106	3	NL
Ctenotus storri	106	3	NL
Aprasia parapulchella	**172**	**3**	**VU**
Ctenotus joanae	200	3	NL
Ctenotus vertebralis	206	3	NL
Furina diadema	582	3	NL
Delma impar	**603**	**3**	**VU**
Furina ornata	689	3	NL
Oedura gracilis	34	4	NL

Diporiphora linga	35	4	NL
Ctenotus xenopleura	35	4	NL
Aprasia pseudopulchella	**36**	**4**	**VU**
Lampropholis caligula	37	4	NL
Ramphotyphlops tovelli	39	4	NL
Ctenotus rufescens	42	4	NL
Rankinia parviceps	43	4	NL
Ctenotus delli	46	4	NL
Varanus baritji	50	4	NL
Chelodina steindachneri	52	4	NL
Cerberus rhynchops	55	4	NL
Eulamprus amplus	57	4	NL
Varanus indicus	58	4	NL
Ctenotus eutaenius	59	4	NL
Anomalopus swansoni	60	4	NL
Pletholax gracilis	61	4	NL
Ramphotyphlops guentheri	65	4	NL
Egernia kintorei	65	4	NL
Ctenotus serventyi	65	4	NL
Lerista kendricki	69	4	NL
Ctenotus septenarius	70	4	NL
Delma pax	94	4	NL
Pseudothecadactylus australis	98	4	NL
Ctenophorus rubens	119	4	NL
Ctenophorus vadnappa	132	4	NL
Cacophis churchilli	38	5	NL
Lerista petersoni	42	5	NL
Gehyra occidentalis	42	5	NL
Cyclodomorphus venustus	42	5	NL
Brachyurophis approximans	44	5	NL
Glaphyromorphus cracens	45	5	NL
Caimanops amphiboluroides	46	5	NL
Delma grayii	53	5	NL
Ctenotus tantillus	54	5	NL
Ramphotyphlops centralis	61	5	NL
Saproscincus hannahae	67	5	NL
Lerista gerrardii	70	5	NL
Ctenotus iapetus	70	5	NL
Lerista picturata	70	5	NL
Strophurus jeanae	75	5	NL
Neelaps bimaculatus	76	5	NL
Ramphotyphlops ammodytes	76	5	NL
Pseudemoia cryodroma	90	5	NL
Ctenotus greeri	95	5	NL
Ctenotus pulchellus	101	5	NL
Acanthophis pyrrhus	117	5	NL
Delma molleri	144	5	NL
Menetia alanae	179	5	NL

Non-passerine (marine birds removed)

Birds in general represent the major number of vertebrate records available in the ANHAT database. This is because of their high visibility and easy detection. The ANHAT database has 3803290 records for 287 species and subspecies of non-passerines. Two species of non-passerines are considered extinct and therefore excluded from analysis. These species are presented in **Table 29**.

Table 29 Non-passerine species considered extinct

Species	Common name	No. of records
Dromaius ater	King Island Emu	1
Psephotus pulcherrimus	Paradise Parrot	28

Thirty two species account for approximately 50% of the total species records in ANHAT. These species have over 30,000 records each, and, in the case of the Laughing Kookaburra (*Dacelo novaeguineae*), over 113250 records.

Table 30 Non-passerine species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% total records
Cacomantis flabelliformis	34854	0.96
Phalacrocorax sulcirostris	37557	1.04
Chroicocephalus novaehollandiae	37603	1.04
Tachybaptus novaehollandiae	38191	1.06
Phaps chalcoptera	38544	1.07
Fulica atra	38767	1.07
Barnardius zonarius	38788	1.07
Psephotus haematonotus	40490	1.12
Todiramphus sanctus	41945	1.16
Microcarbo melanoleucos	42616	1.18
Pelecanus conspicillatus	43932	1.21
Threskiornis spinicollis	45616	1.26
Falco berigora	45939	1.27
Haliastur sphenurus	47770	1.32
Aquila audax	49738	1.37
Platycercus eximius	50640	1.40
Merops ornatus	52162	1.44
Geopelia striata	52576	1.45
Cygnus atratus	53652	1.48
Threskiornis molucca	53725	1.48
Anas gracilis	56834	1.57
Trichoglossus haematodus	58506	1.62
Chenonetta jubata	61759	1.71
Falco cenchroides	62294	1.72

Cacatua galerita	68724	1.90
Platycercus elegans	69114	1.91
Ocyphaps lophotes	87394	2.41
Vanellus miles	87430	2.42
Egretta novaehollandiae	88916	2.46
Anas superciliosa	94270	2.60
Eolophus roseicapillus	97176	2.69
Dacelo novaeguineae	113256	3.13
Total	1830778	50.59

Only three species of birds are represented by 30 or fewer individual record sites in the ANHAT database. None are listed as threatened.

Table 31 Non-passerine species with 30 or fewer individual site records in the ANHAT database.

Species	No. Records	% in Pas	Location	Veg type	Area (km^2)	EPBC status
Leucocarbo atriceps	4	0			400	NL
Collocalia esculenta	18	61.1	UnV		1600	NL
Charadrius hiaticula	26	7.7	UnV		2100	NL

Removal of extinct and poorly recorded species leaves 3564629 records in ANHAT for 282 species (and subspecies). The mean number of records per species for species with greater than 30 records was 14316, with the mean of 22.6 for the percent of records in PAs.

Only 12 species of non-passerines had 45% or greater of individual site records located within the NRS. Of those 12 species, two species are classified as threatened, including one species classified as critically endangered. The small number of species prevents a consideration of trends in this category, but it is noted that this is a very small number of species having "high" reservation compared to the other vertebrates. No species has all or even a very high percentage of its records within reserves.

Table 32 Non-passerine species with >45% of site records within PAs.

Species	No. Records	No. in NRS	Location	Veg type	Area (km^2)	EPBC status
Ninox rufa	422	200 (47.4%)	N	For	16100	NL
Neophema chrysogaster	**845**	**404 (47.8%**	**SE**	**For, He, SM, GrL**	**20000**	**CE**
Casuarius casuarius	**443**	**216 (48.7%)**	**NE**	**RF**	**16100**	**EN**
Tyto multipunctata	168	84 (50.0%)	NE	For	5300	NL
Cacomantis castaneiventris	193	109 (56.5%)	NE	RF	6300	NL
Geophaps smithii	1986	1165 (58.7%)	NE	WL, Op	24900	NL
Geoffroyus geoffroyi	201	127 (63.2%)	NE	RF	3400	NL

Podargus ocellatus	696	456 (65.5%)	NE, E	RF	7400	NL
Eclectus roratus	237	178 (75.1%)	NE	RF	3700	NL
Pezoporus wallicus	2115	1607 (76.0%)	Co, E, SE, Tas	Wet, He, Sand, RE, RG	32900	NL
Petrophassa rufipennis	479	370 (77.2%)	NC	WL, RE, For	9500	NL
Ptilinopus cinctus	283	223 (78.8%)	NC		7800	NL

Thirteen species had less than 10% of ANHAT records located within the NRS. Four of the 13 species are classified as threatened, including one endangered species. Again, the small number of species in this category provides little scope for identifying trends, but it is clear that a relatively large number of species in this group use woodlands, which is a group that has recently been viewed as of considerable concern for their long-term survival. All species have records from within the reserve system.

Table 33 Non-passerine species with <10% of ANHAT records located within PAs.

Species	No. Records	Inside NRS	Location	Veg type	Area (km^2)	EPBC status
Polytelis swainsonii	**2926**	**128 (4.4%)**	**SE**	**For, WL**	**70000**	**VU**
Psephotus chrysopterygius	**176**	**8 (4.5%)**	**NE**	**SaW**	**5400**	**EN**
Nettapus coromandelianus	1451	77 (5.3%)	NE	WL	47300	NL
Bubulcus ibis	11861	827 (7.0%)	MW	GrL, WL	242300	NL
Gallinula tenebrosa	30388	2397 (7.9%)	E, SW	WL	404100	NL
Pedionomus torquatus	**1541**	**123 (8.0%)**	**SE, C**	**GrL**	**27300**	**VU**
Rostratula benghalensis	749	63 (8.4%)	E, NC	Ma		NL
Polytelis alexandrae	**196**	**17 (8.7%)**	**CW**	**Mul, Sp, Ar**	**16100**	**VU**
Vanellus tricolor	10770	1015 (9.4%)	E, SW, Tas	GrL, Op	454400	NL
Elanus axillaris	28580	2700 (9.4%)	MW	WL	674700	NL
Cacatua tenuirostris	8712	828 (9.5%)	E	WL	140800	NL
Porzana pusilla	1542	150 (9.7%)	MW	WL	74800	NL
Cacatua pastinator	314	31 (9.9%)	SW	WL	15300	NL

A total of 171 non-passerine species had records in more than 100 separate PAs. All species in this list had over a thousand records, with an average of 20256 records per species, reflecting the high visibility of common birds to the public in general. Only two species were listed as threatened.

Table 34 Non-passerine species recorded at more than 100 PAs.

Species	No. Records	No. Reserves	No. reserves >1000ha	EPBC status
Phalacrocorax fuscescens	2272	100	74	NL
Porzana tabuensis	1312	101	62	NL
Irediparra gallinacean	5303	101	73	NL
Platycercus icterotis	4494	102	66	NL
Purpureicephalus spurius	5190	105	65	NL
Chrysococcyx minutillus	1849	106	78	NL
Ptilinopus superbus	1536	109	80	NL
Esacus neglectus	2091	109	64	NL
Polytelis anthopeplus	3167	109	85	NL
Stictonetta naevosa	2383	112	57	NL
Porzana fluminea	2277	117	77	NL
Ducula bicolour	3897	117	76	NL
Anseranas semipalmate	11401	119	77	NL
Botaurus poiciloptilus	1668	126	82	NL
Megapodius reinwardt	3507	127	83	NL
Ixobrychus flavicollis	1839	128	98	NL
Hamirostra melanosternon	2938	128	115	NL
Cladorhynchus leucocephalus	2490	130	61	NL
Charadrius bicinctus	2890	132	80	NL
Neophema pulchella	3445	133	104	NL
Dendrocygna eytoni	6056	137	98	NL
Cacatua leadbeateri	6776	139	124	NL
Neophema elegans	3089	141	88	NL
Thinornis rubricollis	3855	146	110	NL
Ardea striata	4084	146	88	NL
Pluvialis fulva	3512	148	87	NL
Oxyura australis	5520	160	77	NL
Platycercus caledonicus	7501	160	98	NL
Leipoa ocellate	**2687**	**163**	**130**	**VU**
Falco subniger	4139	166	131	NL
Egretta sacra	3663	168	111	NL
Cacatua tenuirostris	8712	168	78	NL
Ephippiorhynchus asiaticus	10854	173	129	NL
Dacelo leachii	13756	173	141	NL
Northiella haematogaster	10487	174	122	NL
Plegadis falcinellus	7172	175	114	NL
Bubulcus ibis	11861	175	123	NL
Turnix velox	4587	178	157	NL
Haliastur indus	8666	192	109	NL
Recurvirostra novaehollandiae	5995	193	106	NL

Lathamus discolour	**5187**	**195**	**125**	**EN**
Neophema chrysostoma	4175	197	128	NL
Gallirallus philippensis	4670	198	134	NL
Tyto tenebricosa	3786	201	171	NL
Ptilinopus magnificus	5175	201	144	NL
Ardeotis australis	8158	201	184	NL
Columba leucomela	6349	206	149	NL
Podiceps cristatus	6448	209	110	NL
Lophoictinia isura	2903	210	181	NL
Apus pacificus	2526	212	169	NL
Ptilinopus regina	4026	219	146	NL
Erythrogonys cinctus	7560	220	142	NL
Eurostopodus argus	3742	227	204	NL
Aprosmictus erythropterus	15470	230	192	NL
Gallinula ventralis	7543	234	152	NL
Lopholaimus antarcticus	5012	235	177	NL
Chrysococcyx osculans	3178	240	212	NL
Geopelia cuneata	12213	246	214	NL
Grus rubicundus	12274	252	156	NL
Tyto novaehollandiae	2569	253	217	NL
Burhinus grallarius	8747	260	204	NL
Todiramphus pyrrhopygia	11376	261	230	NL
Ninox connivens	4161	262	218	NL
Aviceda subcristata	6047	268	190	NL
Psephotus varius	12073	269	203	NL
Malacorhynchus membranaceus	11491	272	147	NL
Ardea intermedia	12122	273	186	NL
Callocephalon fimbriatum	12624	278	193	NL
Circus assimilis	7962	279	232	NL
Pandion haliaetus	8840	280	183	NL
Chalcophaps indica	5847	288	196	NL
Vanellus tricolour	10770	289	235	NL
Eurostopodus mystacalis	3686	291	237	NL
Todiramphus macleayii	13809	295	193	NL
Alectura lathami	8836	307	218	NL
Melopsittacus undulates	17134	311	258	NL
Coturnix pectoralis	7949	317	235	NL
Egretta garzetta	12485	319	210	NL
Trichoglossus chlorolepidotus	19198	319	190	NL
Accipiter novaehollandiae	5846	323	238	NL
Anas rhynchotis	13282	326	141	NL
Tyto alba	7270	332	269	NL
Glossopsitta porphyrocephala	8706	334	195	NL
Macropygia amboinensis	12428	340	232	NL
Cacatua sanguinea	19910	341	247	NL
Calyptorhynchus lathami	10543	343	261	NL
Milvus migrans	26762	343	272	NL
Calyptorhynchus banksii	18223	349	259	NL
Leucosarcia melanoleuca	10192	356	282	NL
Phaps elegans	5446	362	255	NL

Ninox strenua	6941	364	271	NL
Scythrops novaehollandiae	9917	369	269	NL
Alcedo azurea	11785	377	282	NL
Glossopsitta concinna	13868	377	213	NL
Eudynamys scolopacea	14945	378	262	NL
Biziura lobata	15103	381	199	NL
Turnix varia	4888	384	280	NL
Nymphicus hollandicus	21854	390	298	NL
Glossopsitta pusilla	10630	406	288	NL
Charadrius ruficapillus	14287	407	258	NL
Centropus phasianinus	19662	409	271	NL
Cacomantis variolosus	10168	410	306	NL
Himantopus himantopus	22448	420	236	NL
Anhinga melanogaster	21751	427	309	NL
Platalea regia	20911	428	231	NL
Nycticorax caledonicus	13108	429	304	NL
Aythya australis	23103	430	242	NL
Gallinula tenebrosa	30388	450	254	NL
Anas castanea	24435	465	235	NL
Phalacrocorax varius	19211	505	321	NL
Platalea flavipes	23539	505	285	NL
Poliocephalus poliocephalus	23541	509	279	NL
Coturnix ypsilophora	9902	511	393	NL
Falco longipennis	13851	512	370	NL
Hirundapus caudacutus	11126	513	371	NL
Geopelia humeralis	32636	520	327	NL
Alisterus scapularis	24696	522	375	NL
Eurystomus orientalis	21571	529	350	NL
Porphyrio porphyrio	32811	533	281	NL
Circus approximans	15938	534	292	NL
Ardea alba	32915	541	356	NL
Platycercus adscitus	29221	542	337	NL
Psephotus haematonotus	40490	542	265	NL
Hieraaetus morphnoides	14013	551	392	NL
Elseyornis melanops	27902	581	387	NL
Elanus axillaris	28580	585	391	NL
Dromaius novaehollandiae	23420	590	489	NL
Tadorna tadornoides	30193	591	260	NL
Haliaeetus leucogaster	19983	601	369	NL
Accipiter cirrhocephalus	10644	606	483	NL
Fulica atra	38767	607	324	NL
Platycercus eximius	50640	608	318	NL
Falco peregrinus	12198	632	451	NL
Pelecanus conspicillatus	43932	687	388	NL
Phalacrocorax carbo	31476	688	422	NL
Threskiornis molucca	53725	692	351	NL
Calyptorhynchus funereus	26142	693	434	NL
Ardea pacifica	34101	696	462	NL
Tachybaptus novaehollandiae	38191	698	434	NL
Microcarbo melanoleucos	42616	705	486	NL

Phalacrocorax sulcirostris	37557	707	433	NL
Threskiornis spinicollis	45616	734	411	NL
Geopelia striata	52576	751	488	NL
Cuculus pallidus	24002	774	552	NL
Cygnus atratus	53652	777	395	NL
Trichoglossus haematodus	58506	778	445	NL
Chrysococcyx lucidus	17410	797	543	NL
Barnardius zonarius	38788	806	555	NL
Haliastur sphenurus	47770	816	504	NL
Anas gracilis	56834	870	501	NL
Aegotheles cristatus	18372	885	674	NL
Chrysococcyx basalis	22074	898	630	NL
Podargus strigoides	24159	919	680	NL
Chenonetta jubata	61759	963	566	NL
Accipiter fasciatus	25873	978	681	NL
Ocyphaps lophotes	87394	978	583	NL
Cacatua galerita	68724	999	584	NL
Merops ornatus	52162	1000	652	NL
Todiramphus sanctus	41945	1029	653	NL
Falco berigora	45939	1043	727	NL
Cacomantis flabelliformis	34854	1046	692	NL
Falco cenchroides	62294	1078	738	NL
Platycercus elegans	69114	1114	611	NL
Phaps chalcoptera	38544	1116	732	NL
Ninox novaeseelandiae	33747	1126	830	NL
Eolophus roseicapillus	97176	1151	701	NL
Vanellus miles	87430	1178	646	NL
Anas superciliosa	94270	1249	682	NL
Egretta novaehollandiae	88916	1293	744	NL
Aquila audax	49738	1373	946	NL
Dacelo novaeguineae	113256	1468	796	NL

A total of seven species had records in five or fewer PAs (**Table 35**). One species is listed as endangered. Three species in this list had fewer than 100 individual site records, and no species had more than 500 site records.

Table 35 Non-passerine species recorded from five or fewer PAs.

Species	No. Records	No. reserves	EPBC Status
Ardenna bulleri	49	3	NL
Petrophassa rufipennis	479	3	NL
Turnix olivii	39	4	NL
Psephotus chrysopterygius	**176**	**4**	**EN**
Ptilinopus cinctus	283	4	NL
Charadrius dubius	64	5	NL
Geoffroyus geoffroyi	201	5	NL

Table 36 lists the seven species of non-passerines that have records in five or fewer PAs greater than 1000 hectares and directly reflects the results of **Table 35**.

Table 36 Non-passerine species recorded in five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. Reserves >1000ha	EPBC status
Ardenna bulleri	49	1	NL
Petrophassa rufipennis	479	2	NL
Turnix olivii	39	3	NL
Charadrius dubius	64	4	NL
Psephotus chrysopterygius	**176**	**4**	**EN**
Ptilinopus cinctus	283	4	NL
Geoffroyus geoffroyi	201	5	NL

Passerines

Passerines, or the song or perching birds, are the most widely recognised and encountered group of vertebrates in Australia. The ANHAT database has 4970696 records for 321 species and subspecies of passerines. There are no extinct passerine species. Twenty-one passerine species account for almost 50% of the total species records in ANHAT (**Table 37**). These species have over 66000 records each, with the highly visible and widely distributed Australian Magpie (*Gymnorhina tibicen*) being the mostly highly recorded species with 177667 record sites.

Table 37 Passerine species that account for almost 50% of the total species records in ANHAT.

Species	No. Records	% total records
Strepera graculina	66000	1.74
Pachycephala pectoralis	66015	1.74
Acanthiza chrysorrhoa	66058	1.74
Lichenostomus penicillatus	67781	1.78
Acanthiza pusilla	70214	1.85
Sericornis frontalis	70430	1.85
Cracticus torquatus	71059	1.87
Manorina melanocephala	71091	1.87
Anthochaera carunculata	77365	2.03
Rhipidura fuliginosa	85792	2.26
Pachycephala rufiventris	88957	2.34
Corvus coronoides	89050	2.34
Zosterops lateralis	89787	2.36
Pardalotus striatus	94612	2.49
Malurus cyaneus	103747	2.73
Hirundo neoxena	107997	2.84
Coracina novaehollandiae	112681	2.96
Colluricincla harmonica	120510	3.17
Grallina cyanoleuca	142056	3.74
Rhipidura leucophrys	156110	4.10
Gymnorhina tibicen	177667	4.67
Total	1994979	52.47

Ten passerine species are represented by 30 or fewer record sites in the ANHAT database. None of these species are listed as threatened. The limited number of species does not allow trends to be identified in this group. However, several vagrants are present in the group and so are expected to be rarely recorded.

Table 38 Passerine species with 30 or fewer site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Anthus cervinus	1	0.0	UR		100	NL
Pitta moluccensis	1	0.0	UR		400	NL
Zosterops natalis	2	0.0	Is	RF	300	NL
Aplonis cantoroides	3	0.0	UnV		100	NL
Falcunculus leucogaster	3	0.0	W	WL, Mal	100	NL
Gerygone igata	5	0.0	NZ		200	NL
Arses lorealis	12	75.0	NE	RF	700	NL
Amytornis ballarae	20	0.0	I	Sp, RH	1200	NL
Acrocephalus orientalis	24	16.7	UR	WL	1200	NL
Cecropis daurica	28	3.6	UnV		1700	NL

Removal of poorly recorded species leaves 4970597 records in ANHAT for 311 species (and subspecies). The mean number of records per species for species with greater than 30 records was 15983, with the mean of 28.9 for the percent of records in PAs.

Forty-seven species of passerines had 45% or greater of their individual record sites located within PAs. Five of these species are classified as threatened, including three species classified as endangered. Rainforest-dwelling species are well represented in group in line with the high reservation rates of this vegetation type. The species in this table generally come from eastern Australia and southern Australia. Very few species come from the western half of Australia.

Table 39 Passerine species with 45% or more of their record sites in PAs.

Species	No. Records	No. Records in PAs	% in PAs	Location	Veg type	Area (km^2)	EPBC status
Origma solitaria	2058	928	45.1	SE	Sand, LS, RG	30800	NL
Lichenostomus cratitius	2248	1015	45.1	S	Mal, WL	76100	NL
Pycnoptilus floccosus	2810	1274	45.3	SE	WF	57100	NL
Sericornis citreogularis	4845	2290	47.3	E	WF	70800	NL
Arses telescophthalmus	304	144	47.4	NE	RF	5600	NL
Lichenostomus ornatus	11325	5396	47.6	S	Mal, WL	241600	NL
Arses kaupi	663	317	47.8	NE	RF	14700	NL
Pitta erythrogaster	89	43	48.3	NE	For	2700	NL
Pachycephala inornata	3050	1477	48.4	S	WL, Mal	92400	NL
Drymodes brunneopygia	2979	1465	49.2	S	Mal	102400	NL
Dasyornis longirostris	**81**	**40**	**49.4**	**SW**	**He, CSw**	**3500**	**VU**
Ptiloris victoriae	1287	655	50.9	NE	RF	15200	NL
Machaerirhynchus flaviventer	1110	570	51.3	NE	RF	20500	NL
Amytornis housei	83	43	51.8	NW	SP	3700	NL
Monarcha frater	107	56	52.3	NE	RF	3800	NL
Pitta iris	783	412	52.6	N	For	22500	NL
Stipiturus malachurus	6268	3300	52.6	SE, SW, TAS	He, Wet	104500	NL

Zosterops citrinellus	66	35	53.0	NE	WL, For	5700	NL
Amytornis purnelli	853	458	53.7	I	GrL	23900	NL
Colluricincla woodwardi	808	439	54.3	N	Sand, Cl	29500	NL
Lichenostomus frenatus	1032	567	54.9	NE	RF	12500	NL
Dasyornis brachypterus	**1389**	**774**	**55.7**	**SE**	**He, CSw**	**9500**	**EN**
Calamanthus cautus	2321	1298	55.9	S	Mal	82300	NL
Poecilodryas albispecularis	1362	770	56.5	NE	RF	11900	NL
Scenopoeetes dentirostris	627	356	56.8	NE	HRF	10100	NL
Acanthiza katherina	567	325	57.3	NE	RF	9000	NL
Ptiloris paradiseus	1797	1036	57.6	E	RF	31100	NL
Colluricincla boweri	744	430	57.8	NE	RF	10800	NL
Cinclosoma castanotus	2339	1373	58.7	S	Mal, Mu	92300	NL
Amytornis striatus	1121	666	59.4	NC	GrL, Mal	41700	NL
Tregellasia leucops	255	153	60.0	NE	RF	3500	NL
Psophodes nigrogularis	**418**	**252**	**60.3**	**SW, SC**	**Mal, He, Th**	**16700**	**VU/EN**
Menura alberti	1751	1064	60.8	E	RF	10300	NL
Drymodes superciliaris	176	107	60.8	NE	For	4000	NL
Atrichornis clamosus	**126**	**77**	**61.1**	**SW**	**CV**	**3300**	**VU**
Orthonyx spaldingii	807	498	61.7	NE	RF	14100	NL
Microeca griseoceps	125	78	62.4	NE	RF	3200	NL
Sericornis keri	344	216	62.8	NE	HRF	5900	NL
Prionodura newtoniana	338	219	64.8	NE	HRF	7200	NL
Meliphaga albilineata	491	340	69.2	NW	Gor	13200	NL
Erythrura trichroa	140	99	70.7	NE	RF	2600	NL
Pachycephala rufogularis	422	300	71.1	SE	Mal	17700	NL
Oreoscopus gutturalis	524	374	71.4	NE	RF	8500	NL
Timeliopsis fallax	103	79	76.7	NE	RF	2400	NL
Stipiturus mallee	**142**	**111**	**78.2**	**SE**	**Mal**	**4900**	**EN**
Amytornis woodwardi	101	82	81.2	N	Sp	3400	NL
Atrichornis rufescens	756	640	84.7	SE	For	9700	NL

Thirteen species had less than 10% of ANHAT records located within the NRS. One of the 13 species is classified as endangered. The species in this table are scattered across Australia. There is also no obvious habitat type that dominates the preference of this group.

Table 40 Passerine species with <10% of ANHAT records located within the NRS.

Species	No. Records	No. in PAs	Location	Veg type	Area (km^2)	EPBC status
Amytornis barbatus	95	1 (1.0%)	C	GrL	4300	NL
Aphelocephala pectoralis	102	4 (3.9%)	ICS	Ar	5900	NL
Gerygone tenebrosa	232	10 (4.3%)	NW	Man, Gor	10800	NL
Pachycephala lanioides	346	16 (4.6%)	N	Man	15500	NL
Hirundo rustica	226	11 (4.9%)	N	Op, Ur	10300	NL
Amytornis dorotheae	77	4 (5.2%)	NC	SP	3000	NL

Neochmia modesta	2069	146 (7.1%)	E	WL	106000	NL
Amytornis textilis	260	20 (7.7%)	SC, W	SB, GrL	26100	NL
Erythrura gouldiae	**1911**	**152 (7.9%)**	**N**	**WL, GrL**	**46200**	**EN**
Mirafra javanica	7123	615 (8.6%)	E, N	GrL	332800	NL
Acrocephalus australis	17878	1601 (9.0%)	MW	WL	365000	NL
Coracina maxima	4177	386 (9.2%)	I	WL	246800	NL
Manorina melanocephala	71091	6919 (9.7%)	E, Tas	WL	752100	NL

A total of 167 passerine species had records in more than 100 separate PAs. All species had over a thousand records, with an average of 28471 records per species. None of these species are listed as threatened.

Table 41 Passerine species recorded at more than 100 PAs.

Species	No. Records	No. PAs	No. Pas >1000ha	EPBC status
Epthianura aurifrons	3892	102	96	NL
Orthonyx temminckii	2794	106	87	NL
Nectarinia jugularis	4470	107	65	NL
Cinclosoma castanotus	2339	108	93	NL
Chlamydera maculata	4597	109	97	NL
Acanthiza ewingii	3692	111	83	NL
Acanthorhynchus superciliosus	5327	112	76	NL
Certhionyx variegatus	2458	114	103	NL
Eopsaltria griseogularis	2387	115	91	NL
Strepera fuliginosa	4410	116	85	NL
Monarcha leucotis	1755	117	81	NL
Symposiachrus trivirgatus	2321	120	89	NL
Pardalotus rubricatus	5574	123	111	NL
Sericulus chrysocephalus	3697	124	88	NL
Coracina maxima	4177	127	114	NL
Lichenostomus plumulus	3839	128	113	NL
Calamanthus fuliginosus	3480	136	112	NL
Lichenostomus cratitius	2248	137	99	NL
Pachycephala inornata	3050	137	103	NL
Calamanthus pyrrhopygius	1945	142	115	NL
Lichenostomus flavicollis	7136	144	90	NL
Pyrrholaemus brunneus	2644	145	128	NL
Calamanthus cautus	2321	149	113	NL
Megalurus timoriensis	4263	150	100	NL
Lonchura castaneothorax	5902	158	110	NL
Myzomela obscura	7691	158	109	NL
Petroica rodinogaster	3011	158	116	NL
Tregellasia capito	3783	159	118	NL
Stagonopleura bella	3114	165	117	NL

Mirafra javanica	7123	174	139	NL
Drymodes brunneopygia	2979	181	126	NL
Manorina melanophrys	11083	185	129	NL
Pyrrholaemus sagittatus	7744	187	128	NL
Sericornis citreogularis	4845	187	151	NL
Artamus minor	6516	195	176	NL
Epthianura tricolor	8001	195	176	NL
Struthidea cinerea	17379	199	164	NL
Malurus leucopterus	13273	201	176	NL
Cheramoeca leucosternus	7598	210	182	NL
Pitta versicolor	3832	212	149	NL
Corvus bennetti	9673	214	196	NL
Climacteris erythrops	4475	216	181	NL
Ailuroedus crassirostris	6806	219	169	NL
Stipiturus malachurus	6268	220	160	NL
Pachycephala olivacea	5637	225	171	NL
Alauda arvensis	10374	230	122	NL
Phylidonyris nigra	10037	237	165	NL
Stagonopleura guttata	10098	245	154	NL
Corvus tasmanicus	8739	253	161	NL
Megalurus gramineus	9149	255	158	NL
Lichenostomus ornatus	11325	270	179	NL
Phylidonyris albifrons	8666	273	207	NL
Colluricincla megarhyncha	10131	274	180	NL
Lichenostomus melanops	16790	276	196	NL
Menura novaehollandiae	13145	280	226	NL
Plectorhyncha lanceolata	14696	287	212	NL
Sericornis magnirostris	8915	290	215	NL
Gliciphila melanops	5501	292	221	NL
Melithreptus gularis	8149	292	198	NL
Petroica boodang	5804	296	191	NL
Cinclosoma punctatum	4684	309	258	NL
Lichenostomus fuscus	13863	312	208	NL
Lalage leucomela	11625	314	206	NL
Cincloramphus cruralis	12356	322	247	NL
Acrocephalus australis	17878	324	213	NL
Aphelocephala leucopsis	16467	325	242	NL
Malurus splendens	14365	333	233	NL
Melithreptus albogularis	20650	333	229	NL
Taeniopygia guttata	34652	333	271	NL
Gerygone mouki	11248	346	242	NL
Zoothera lunulata	6687	346	251	NL
Malurus melanocephalus	22418	355	241	NL
Sphecotheres vieilloti	20955	361	220	NL
Cisticola exilis	17984	369	219	NL
Ptilonorhynchus violaceus	17587	371	282	NL
Artamus personatus	9312	372	302	NL
Entomyzon cyanotis	25552	372	279	NL
Monarcha melanopsis	9483	372	260	NL
Phylidonyris pyrrhoptera	15614	372	234	NL

Petroica rosea	9205	373	269	NL
Artamus leucorynchus	16247	381	267	NL
Myiagra cyanoleuca	6391	382	258	NL
Oreoica gutturalis	20700	385	313	NL
Acanthiza uropygialis	17656	389	278	NL
Artamus cinereus	31963	401	331	NL
Gerygone fusca	15446	408	267	NL
Petroica phoenicea	15616	410	275	NL
Pomatostomus temporalis	27370	410	324	NL
Dicrurus bracteatus	20583	411	251	NL
Myzomela sanguinolenta	16210	414	274	NL
Taeniopygia bichenovii	27131	418	302	NL
Artamus superciliosus	12171	445	318	NL
Philemon citreogularis	26454	455	329	NL
Cincloramphus mathewsi	17992	456	329	NL
Coracina tenuirostris	9681	461	334	NL
Coracina papuensis	18133	466	342	NL
Epthianura albifrons	17004	471	312	NL
Melanodryas cucullata	16563	477	354	NL
Manorina flavigula	37931	488	393	NL
Petroica multicolor	19160	507	319	NL
Anthochaera chrysoptera	27735	508	298	NL
Petrochelidon ariel	24851	527	384	NL
Psophodes olivaceus	35974	532	345	NL
Falcunculus frontatus	17332	546	360	NL
Gerygone olivacea	19396	547	361	NL
Meliphaga lewinii	39646	556	356	NL
Acanthiza apicalis	18109	557	392	NL
Rhipidura rufifrons	17975	562	372	NL
Pomatostomus superciliosus	24648	564	356	NL
Corvus orru	48538	569	384	NL
Petroica goodenovii	27390	588	404	NL
Corvus mellori	29370	601	298	NL
Acanthiza nana	27086	614	381	NL
Acanthagenys rufogularis	38173	615	427	NL
Lalage tricolor	23695	629	468	NL
Acanthiza reguloides	20202	630	399	NL
Rhipidura albiscapa	20508	661	425	NL
Myiagra rubecula	20549	682	462	NL
Corcorax melanorhamphos	33685	694	414	NL
Lichmera indistincta	48244	701	459	NL
Climacteris picumnus	30135	704	450	NL
Lichenostomus virescens	45158	712	454	NL
Philemon corniculatus	39457	727	480	NL
Lichenostomus penicillatus	67781	730	379	NL
Cracticus nigrogularis	62161	733	523	NL
Myiagra inquieta	34650	755	510	NL
Melithreptus lunatus	31042	762	475	NL
Oriolus sagittatus	28561	774	502	NL
Malurus lamberti	36359	781	554	NL

Strepera versicolor	26003	791	472	NL
Acanthiza lineata	39424	795	461	NL
Microeca fascinans	35467	797	574	NL
Melithreptus brevirostris	26894	807	502	NL
Lichenostomus leucotis	32381	811	511	NL
Manorina melanocephala	71091	814	447	NL
Neochmia temporalis	53443	818	467	NL
Cormobates leucophaeus	46935	820	489	NL
Phylidonyris novaehollandiae	51437	821	448	NL
Acanthorhynchus tenuirostris	52543	860	516	NL
Daphoenositta chrysoptera	24023	907	630	NL
Artamus cyanopterus	32212	920	595	NL
Strepera graculina	66000	927	570	NL
Eopsaltria australis	65430	943	574	NL
Anthus australis	49612	945	700	NL
Lichenostomus chrysops	59178	957	539	NL
Smicrornis brevirostris	51821	1097	697	NL
Petrochelidon nigricans	41282	1124	728	NL
Acanthiza pusilla	70214	1133	620	NL
Acanthiza chrysorrhoa	66058	1167	670	NL
Anthochaera carunculata	77365	1190	634	NL
Dicaeum hirundinaceum	55482	1191	764	NL
Cracticus torquatus	71059	1264	822	NL
Malurus cyaneus	103747	1281	640	NL
Sericornis frontalis	70430	1306	796	NL
Corvus coronoides	89050	1362	783	NL
Pachycephala pectoralis	66015	1374	819	NL
Grallina cyanoleuca	142056	1398	815	NL
Pardalotus punctatus	59588	1400	877	NL
Hirundo neoxena	107997	1459	828	NL
Pachycephala rufiventris	88957	1476	910	NL
Rhipidura fuliginosa	85792	1505	910	NL
Zosterops lateralis	89787	1513	864	NL
Pardalotus striatus	94612	1650	972	NL
Rhipidura leucophrys	156110	1668	961	NL
Coracina novaehollandiae	112681	1724	1050	NL
Gymnorhina tibicen	177667	1958	1007	NL
Colluricincla harmonica	120510	1976	1121	NL

A total of 14 species had records in five or fewer PAs (**Table 42**). One species is listed as threatened. The majority of species in this list had fewer than 100 individual site records, and no species had more than 500 site records. The genus *Amytornis* had four representatives. These are the grass wrens that inhabit grasslands and shrublands of drier parts of Australia. Such areas are generally not well reserved, which reflects the results for the grass wrens.

Table 42 Passerine species recorded from five or fewer PAs.

Species	No. Records	No. PAs	EPBC status
Amytornis barbatus	95	1	NL
Lichenostomus hindwoodi	307	1	NL
Falcunculus whitei	36	2	NL
Anthochaera lunulata	64	2	NL
Amytornis dorotheae	77	2	NL
Amytornis housei	83	3	NL
Amytornis woodwardi	101	3	NL
Aphelocephala pectoralis	102	3	NL
Motacilla cinerea	34	4	NL
Pitta erythrogaster	89	4	NL
Dasyornis longirostris	**81**	**5**	**VU**
Chlamydera cerviniventris	209	5	NL
Tregellasia leucops	255	5	NL
Meliphaga albilineata	491	5	NL

Eighteen species of passerines had records in five or fewer PAs greater than 1000 hectares, including one threatened species (**Table 43**). All occurred in at least one PA greater than 1000 ha in size.

Table 43 Passerine species recorded in five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. PAs >1000ha	EPBC status
Amytornis barbatus	95	1	NL
Lichenostomus hindwoodi	307	1	NL
Falcunculus whitei	36	2	NL
Anthochaera lunulata	64	2	NL
Amytornis dorotheae	77	2	NL
Aphelocephala pectoralis	102	2	NL
Motacilla cinerea	34	3	NL
Zosterops citrinellus	66	3	NL
Amytornis housei	83	3	NL
Pitta erythrogaster	89	3	NL
Amytornis woodwardi	101	3	NL
Monarcha frater	107	4	NL
Dasyornis longirostris	**81**	**5**	**VU**
Chlamydera cerviniventris	209	5	NL
Hirundo rustica	226	5	NL
Tregellasia leucops	255	5	NL
Phonygammus keraudrenii	378	5	NL
Meliphaga albilineata	491	5	NL

Dragonflies and Damselflies (Odonata)

The ANHAT database has 9751 records for 283 species and subspecies of dragonflies and damselflies. Thirty-two species account for approximately 50% of the total species records in ANHAT. These species have over 80 records each, and, in the case of the *Austroargiolestes icteromelas*, over 400 records.

Table 44 Dragonfly and damselfly species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% total records
Austroargiolestes aureus	85	0.87
Austroagrion watsoni	87	0.89
Austrolestes annulosus	88	0.90
Austroagrion exclamationis	89	0.91
Pseudagrion aureofrons	90	0.92
Synthemis eustalacta	94	0.96
Hemicordulia intermedia	96	0.98
Ceriagrion aeruginosum	96	0.98
Austrolestes analis	102	1.05
Austroaeschna pulchra	104	1.07
Adversaeschna brevistyla	109	1.12
Hemigomphus heteroclytus	114	1.17
Archiargiolestes pusillus	119	1.22
Austrolestes cingulatus	120	1.23
Diphlebia euphoeoides	127	1.30
Choristhemis flavoterminata	132	1.35
Agriocnemis pygmaea	135	1.38
Nososticta solitaria	149	1.53
Austrolestes psyche	150	1.54
Argiocnemis rubescens	153	1.57
Pseudagrion ignifer	155	1.59
Xanthagrion erythroneurum	157	1.61
Austrolestes leda	166	1.70
Hemicordulia australiae	169	1.73
Petalura gigantea	169	1.73
Synlestes weyersii	182	1.87
Hemicordulia tau	182	1.87
Hemianax papuensis	204	2.09
Pseudagrion microcephalum	227	2.33
Ischnura aurora	260	2.67
Ischnura heterosticta	353	3.62
Austroargiolestes icteromelas	445	4.56
Total	4908	50.31

One hundred and fifteen species are represented by 10 or fewer individual site records in the ANHAT database. None of these species are listed as threatened. Given the limited number of records available for most species, this would appear likely to change if the species were to be assessed for listing under the EPBC Act. By their nature, this group of invertebrates are relatively dependent on wetlands and so this comes out as a common factor linking species in this table. However, a number of species are also associated with rainforest environments where their wetlands are located. Additionally, there are several species from montane areas on this list. As expected, there are very few species that are present within more inland and so arid areas as water supplies are less favourable for this group. The majority of species in this category are from the northern half of Australia.

Table 45 Dragonfly and damselfly species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in PAs	Location	Veg type	Area (km^2)	EPBC status
Agyrtacantha dirupta	1	100.0	NE		100	NL
Anax georgius	1	100.0	NW	Wet	100	NL
Austrocordulia territoria	1	100.0	CN	Wet	100	NL
Choristhemis olivei	1	100.0	NE		100	NL
Cordulephya divergens	1	100.0	SE	Wet	100	NL
Eurysticta reevesi	1	100.0	NE	Wet	100	NL
Eusynthemis barbarae	1	100.0	NE	RF Wet	100	NL
Hemigomphus atratus	1	100.0	NE	RF Wet	100	NL
Lathrocordulia garrisoni	1	100.0	NE	RF Wet	100	NL
Neosticta silvarum	1	100.0	NE	RF Wet	200	NL
Petalura pulcherrima	1	100.0	NE	RF Wet	200	NL
Acanthaeschna victoria	1	0.0	E	Wet	100	NL
Agrionoptera insignis allogenes	1	0.0	CN, NE, E	Wet	100	NL
Antipodogomphus dentosus	1	0.0	CN	Wet	100	NL
Austroargiolestes icteromelas nigrolabiatus	1	0.0	NE	Wet	200	NL
Austrogomphus angelorum	1	0.0	E, SE	Wet	100	NL
Eusynthemis ursula	1	0.0	SE	Wet > 980m	100	NL
Micromidia rodericki	1	0.0	NE	RF Wet	100	NL
Potamarcha congener	1	0.0	CN, NE	Wet	200	NL
Raphismia bispina	1	0.0	NE	Man, Wet	100	NL
Rhodothemis lieftincki	1	0.0	W, CN, NE, E	Wet	500	NL
Zyxomma petiolatum	1	0.0	CN, NE	Wet	200	NL
Archaeosynthemis spiniger	2	100.0	SW	Wet	100	NL
Austroaeschna christine	2	50.0	NE	Mon, RF, Wet	200	NL
Austroaeschna eungella	2	50.0	NE	Mon, RF, Wet	200	NL
Austrophlebia subcostalis	2	50.0	NE	RF Wet	200	NL
Eusynthemis tenera	2	50.0	NE	RF Wet	200	NL
Eusynthemis ursa	2	100.0	SE		200	NL
Hemicordulia kalliste	2	50.0	CN, NE		200	NL
Lathrocordulia metallica	2	50.0	SW	Wet	300	NL
Macromia viridescens	2	100.0	NE	Wet	300	NL
Odontogomphus donnellyi	2	100.0	NE	RF Wet	200	NL

Telephlebia undia	2	100.0	IE	Wet	200	NL
Austroaeschna speciosa	2	0.0	NE	Wet	200	NL
Austrogomphus doddi	2	0.0	NE	Wet	300	NL
Diplacodes melanopsis	2	0.0	E, SE	Wet	200	NL
Gynacantha kirbyi	2	0.0	NE		300	NL
Ischnura heterosticta tasmanica	2	0.0	TAS	Wet	200	NL
Nannophya paulsoni	2	0.0	SE	Wet	200	NL
Nososticta taracumbi	2	0.0	CN	Wet	600	NL
Orthetrum sabina	2	0.0			1900	NL
Petalura litorea	2	0.0	E	Wet	300	NL
Tetrathemis irregularis cladophila	2	0.0	NE	RF Wet	100	NL
Tramea stenoloba	2	0.0	W, C, NE, E	Wet		NL
Anaciaeschna jaspidea	3	33.3	CN, NE, E	Wet	400	NL
Austroargiolestes elke	3	33.3	NE	RF Wet	200	NL
Austropetalia tonyana	3	66.7	SE	Wet	300	NL
Austrosticta soror	3	33.3	NW	Wet	300	NL
Griseargiolestes bucki	3	33.3	E	Wet	200	NL
Hemigomphus cooloola	3	100.0	E	Wet	200	NL
Zephyrogomphus longipositor	3	66.7	NE	RF Wet	300	NL
Episynlestes intermedius	3	0.0	NE	Wet	200	NL
Eurysticta kununurra	3	0.0	CN	Wet	300	NL
Orthetrum migratum	3	0.0	W, C, E, NE	Wet	1500	NL
Telephlebia tryoni	3	0.0	E	RF Wet	400	NL
Zyxomma elgneri	3	0.0	W, CN, NE, E	Wet	300	NL
Archaeophya adamsi	4	25.0	E, SE	Wet	400	NL
Austrocordulia leonardi	4	25.0	SE	Wet	400	NL
Austroepigomphus turneri	4	25.0	CN, NE	Wet	500	NL
Hemicordulia koomina	4	50.0	W	Wet	300	NL
Nannophya australis	4	50.0	NE, E, SE	Wet	300	NL
Tonyosynthemis ofarrelli	4	75.0	E	Wet	400	NL
Antipodogomphus edentulus	4	0.0	NE	Wet	300	NL
Crocothemis nigrifrons	4	0.0	Co MAW	Wet	1300	NL
Aethriamanta nymphaeae	5	40.0	CN, E, NE	Wet	800	NL
Antipodogomphus hodgkini	5	80.0	W	Wet	300	NL
Hemicordulia flava	5	100.0	CI, WI	Wet	500	NL
Hemigomphus magela	5	80.0	CN		400	NL
Lestoidea barbarae	5	100.0	NE	RF Wet	300	NL
Spinaeschna watsoni	5	60.0	NE	Wet	500	NL
Apocordulia macrops	5	0.0	SE		400	NL
Cordulephya bidens	5	0.0	NE	RF Wet	300	NL
Tramea eurybia	5	0.0	E	Wet		NL
Tonyosynthemis claviculata	5	20.0	NE	Wet	400	NL
Aethriamanta nymphaeae	5	40.0	CN, E, NE	Wet	800	NL
Antipodogomphus hodgkini	5	80.0	W	Wet	300	NL
Apocordulia macrops	5	0.0	SE		400	NL
Cordulephya bidens	5	0.0	NE	RF Wet	300	NL
Hemicordulia flava	5	100.0	CI, WI	Wet	500	NL
Hemigomphus magela	5	80.0	CN		400	NL
Lestoidea barbarae	5	100.0	NE	RF Wet	300	NL

Spinaeschna watsoni	5	60.0	NE	Wet	500	NL
Tonyosynthemis claviculata	5	20.0	NE	Wet	400	NL
Tramea eurybia	5	0.0	E	Wet		NL
Austroargiolestes alpinus	6	33.3	E	Wet	400	NL
Caliagrion billinghursti	6	0.0	E, SE	Wet	300	NL
Diphlebia coerulescens	6	16.7	NE, E	Wet	400	NL
Eurysticta coolawanyah	6	50.0	W	Wet	400	NL
Eusynthemis deniseae	6	100.0	EI	Wet	100	NL
Ictinogomphus paulini	6	66.7	NE	Wet	300	NL
Micromidia convergens	6	50.0	E	Wet	300	NL
Petalura hesperia	6	0.0	SW	Wet	600	NL
Synlestes weyersii tillyardi	6	66.7	E	Mon Wet	500	NL
Archipetalia auriculata	7	85.7	TAS	Wet	1300	NL
Armagomphus armiger	7	57.1	SW	Wet	600	NL
Lithosticta macra	7	28.6	CN	Wet	400	NL
Antipodophlebia asthenes	8	25.0	E	Wet	800	NL
Archaeophya magnifica	8	12.5	NE	RF Wet	700	NL
Austroaeschna atrata	8	75.0	SE	Mon, Wet	900	NL
Austrophya mystica	8	0.0	NE	RF Wet	700	NL
Cordulephya montana	8	75.0	SE	Wet	600	NL
Eurysticta coomalie	8	25.0	CN	Wet	700	NL
Petalura ingentissima	8	12.5	NE	RF Wet	600	NL
Pseudocordulia circularis	8	25.0	NE	RF Wet	500	NL
Zephyrogomphus lateralis	8	12.5	SW	Wet	900	NL
Antipodogomphus acolythus	9	0.0	NE, E, SE	Wet	900	NL
Antipodogomphus neophytus	9	22.2	NW, CN, NE	Wet	800	NL
Austroaeschna flavomaculata	9	100.0	SE	RF Wet	800	NL
Hemicordulia superba	9	44.4	E	Wet	800	NL
Hemigomphus theischingeri	9	44.4	NE	RF Wet	500	NL
Pseudocordulia elliptica	9	66.7	NE	RF Wet	600	NL
Tholymis tillarga	9	33.3	CN, NE, E	Wet	1600	NL
Aethriamanta circumsignata	10	40.0	N, E	Wet	1000	NL
Austroaeschna muelleri	10	100.0	E	Wet	200	NL
Austroargiolestes chrysoides	10	40.0	E	RF Wet	800	NL
Austrogomphus arbustorum	10	0.0	NE	Wet	600	NL
Austropetalia patricia	10	20.0	SE	Wet	700	NL
Eusynthemis rentziana	10	30.0	E	Wet	900	NL
Griseargiolestes fontanus	10	30.0	E	Wet	700	NL
Hesperocordulia berthoudi	10	20.0	SW	Wet	700	NL
Nososticta kalumburu	10	100.0	CN	Wet	800	NL
Nososticta pilbara	10	70.0	W	Wet	500	NL
Pantala flavescens	10	20.0	MAW	Wet	4300	NL
Podopteryx selysi	10	30.0	CN, NE	RF Wet	600	NL
Synthemiopsis gomphomacromioides	10	90.0	TAS	Mon Wet	700	NL

The removal of the records of the poorly recorded species leaves 9227 records in ANHAT for 168 species (and subspecies). The mean number of records per species for species with greater than 10 records was 55, with a mean of 29 for the percent of records in PAs. Of

these, 38 species had 45% or greater of individual site records located within the NRS (**Table 46**), none which have yet been listed as threatened. This is an area that needs addressing. There are three rainforest and four montane wetland species in this list. No species had all records within PAs.

Table 46 Dragonfly and damselfly species with >45% of site records within the NRS.

Species	No. Records	Records in PAs	Location	Veg type	Area (km^2)	EPBC status
Nosoticta fraterna	84	38 (45.2%)	CN, NE	Wet	4900	NL
Austroaeschna tasmanica	22	10 (45.4%)	TAS	Wet	1700	NL
Austroaeschna subapicalis	39	18 (46.1%)	E, SE	Mon, Wet	2800	NL
Synlestes tropicus	39	18 (46.1%)	NE	RF Wet	1300	NL
Griseargiolestes albescens	15	7 (46.7%)	E	Wet	1000	NL
Austroaeschna multipunctata	30	14 (46.7%)	SE	Mon, Wet	2300	NL
Eusynthemis aurolineata	30	14 (46.7%)	E	Mon, Wet	2300	NL
Austroepigomphus gordoni	17	8 (47.1%)	W, I	Wet	1300	NL
Archaeosynthemis orientalis	19	9 (47.4%)	E, SE, CS	Wet	1500	NL
Chorismagrion risi	40	19 (47.5%)	NE	RF Wet	2100	NL
Austrogomphus mjobergi	23	11 (47.8%)	NW, CN, NE	Wet	1300	NL
Ischnura pruinescens	63	31 (49.2%)	CN, NE, E	Wet	2500	NL
Austroargiolestes brookhousei	12	6 (50.0%)	E	Wet	900	NL
Austroagrion pindrina	20	10 (50.0%)	NW	Wet	700	NL
Austroargiolestes isabellae	28	14 (50.0%)	SE	Wet	1700	NL
Eusynthemis brevistyla	56	29 (51.8%)	SE	Wet	4500	NL
Telephlebia brevicauda	46	24 (52.2%)	SE	Al Wet	3700	NL
Nannophlebia injibandi	13	7 (53.8%)	W	Wet	900	NL
Griseargiolestes intermedius	11	6 (54.5%)	SE	Wet	1100	NL
Indolestes obiri	11	6 (54.5%)	CN	Wet	800	NL
Nosoticta baroalba	22	12 (54.5%)	CN	Wet	800	NL
Austroaeschna inermis	20	11 (55.0%)	SE	Mon, Wet	1800	NL
Agriocnemis kunjina	29	16 (55.2%)	W	Wet	700	NL
Petalura gigantea	169	94 (55.6%)	E	Wet	4400	NL
Austroargiolestes calcaris	34	20 (58.8%)	SE	Wet	2600	NL
Austroaeschna hardyi	45	27 (60.0%)	TAS	Al Th	3800	NL
Eusynthemis guttata	24	15 (62.5%)	SE	Al Mon WL	2300	NL
Griseargiolestes eboracus	24	15 (62.5%)	E, SE	Wet	2200	NL
Synthemis tasmanica	45	29 (64.4%)	TAS	Wet	3100	NL
Austrolestes minjerriba	26	17 (65.4%)	E	Wet	1800	NL
Urothemis aliena	12	8 (66.7%)	CN, NE, E	Wet	900	NL
Nannophlebia mudginberri	15	10 (66.7%)	CN	Wet	1000	NL
Austroargiolestes christine	16	11 (68.7%)	E	Wet	1300	NL
Austrocnemis maccullochi	54	38 (70.4%)	CN, NE	Wet	1800	NL
Ictinogomphus dobsoni	11	9 (72.7%)	W	Wet	700	NL
Pentathemis membranulata	15	11 (73.3%)	CN, NE	Wet	1200	NL
Nosoticta koongarra	27	20 (74.1%)	CN	Wet	400	NL
Episynlestes cristatus	11	10 (91.0%)	NE	RF Wet	500	NL

Thirty species had less than 10% of ANHAT records located within the NRS (**Table 47**). None of the species are listed as threatened. One species had no records from the reserve system. Notably, four species had very broad ranges across Australia, but still had few records and few in reserves. Species from the west of Australia were represented in this under-reserved group.

Table 47 Dragonfly and damselfly species with <10% of ANHAT records located within the NRS.

Species	No. Records	Inside PAs	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Austrogomphus bifurcatus	16	0	0.00	NE	Wet	900	NL
Pseudagrion aureofrons	90	0	0.00	W, CN, NE,E, SE	Wet	4200	NL
Austrogomphus australis	34	1	2.94	E, SE	Wet	3300	NL
Gynacantha rosenbergi	24	1	4.17	NE	Wet	1300	NL
Austrogomphus collaris	45	2	4.44	SW	Wet	4400	NL
Archiargiolestes parvulus	21	1	4.76	SW	Wet	1500	NL
Austroepigomphus melaleucae	18	1	5.56	E, NE	Wet	1300	NL
Orthetrum caledonicum	35	2	5.71	AW	Wet	14000	NL
Austroaeschna anacantha	17	1	5.88	SW	Wet	1500	NL
Anax guttatus	16	1	6.25	NW, CN, NE, E	Wet	2000	NL
Antipodogomphus proselythus	16	1	6.25	NE, E	Wet	800	NL
Indolestes alleni	16	1	6.25	CN, NE	Wet	1200	NL
Archaeosynthemis leachii	15	1	6.67	SW	Wet	1100	NL
Archiargiolestes pusillus	119	8	6.72	SW	Wet	9600	NL
Diphlebia nymphoides	43	3	6.98	E, SE	Wet	3400	NL
Procordulia affinis	14	1	7.14	SE	Wet	1500	NL
Nososticta solida	56	4	7.14	NE, E, NE	Wet	4000	NL
Parasynthemis regina	27	2	7.41	E, SE	Wet	2100	NL
Gynacantha mocsaryi	13	1	7.69	NE	Wet	1300	NL
Macromia tillyardi	13	1	7.69	CN, NE, E	Wet	900	NL
Archaeosynthemis occidentalis	12	1	8.33	SW	Wet	900	NL
Austrosynthemis cyanitincta	12	1	8.33	SW	Wet	1100	NL
Diplacodes bipunctata	12	1	8.33	MAW	Wet	12500	NL
Orthetrum villosovittatum	12	1	8.33	CN, NE,E, SE	Wet	1400	NL
Indolestes tenuissimus	23	2	8.70	NE	Wet	1200	NL
Anax gibbosulus	11	1	9.09	NW, CN, NE, E	Wet	1700	NL
Austroagrion cyane	75	7	9.33	SW, CS	Wet	5000	NL
Agriocnemis dobsoni	21	2	9.52	NE	Wet	500	NL
Telephlebia tillyardi	21	2	9.52	NE	Wet	1700	NL
Austrogynacantha heterogena	50	5	10.00	MAW	Wet	5100	NL

The dragonfly or damselfly group is relatively poorly represented by records and no species had records in more than 100 separate PAs. In fact, only one species had records in more than 50 separate PAs. This is not a reflection on this group in general having only small ranges, but rather the relatively poor levels of surveys and records.

Table 48 Dragonfly and damselfly species recorded at more than 50 PAs.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Austroargiolestes icteromelas	445	53	49	NL

A total of 90 species had five or fewer records in 100 separate reserves and 89 species had five or fewe records in reserves 1000 ha or greater. None of these species are listed as threatened. The majority of species in this list had fewer than 100 individual site records, and no species had more than 135 site records.

Table 49 Dragonfly and damselfly species with records in five or fewer PAs and PAs of 1000 ha or more.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Diplacodes bipunctata	12	1	0	NL
Austrocnemis splendida	32	1	0	NL
Orthetrum villosovittatum	12	1	0	NL
Agriocnemis rubricauda	20	1	1	NL
Anax gibbosulus	11	1	1	NL
Anax guttatus	16	1	1	NL
Macromia tillyardi	13	1	1	NL
Antipodogomphus proselythus	16	1	1	NL
Archaeosynthemis leachii	15	1	1	NL
Indolestes obiri	11	1	1	NL
Austrosynthemis cyanitincta	12	1	1	NL
Indolestes alleni	16	1	1	NL
Archaeosynthemis occidentalis	12	1	1	NL
Archiargiolestes parvulus	21	1	1	NL
Gynacantha rosenbergi	24	1	1	NL
Gynacantha mocsaryi	13	1	1	NL
Indolestes tenuissimus	23	1	1	NL
Austroepigomphus melaleucae	18	1	1	NL
Teinobasis rufithorax	14	1	1	NL
Agriocnemis argentea	56	1	1	NL
Nososticta koongarra	27	1	1	NL
Austroagrion pindrina	20	1	1	NL
Rhadinosticta banksi	19	1	1	NL
Austrogomphus collaris	45	1	1	NL
Agriocnemis dobsoni	21	1	1	NL

Agriocnemis kunjina	29	1	1	NL
Austrogomphus australis	34	1	1	NL
Procordulia affinis	14	1	1	NL
Nososticta koolpinyah	16	1	1	NL
Austroargiolestes amabilis	23	1	1	NL
Austroaeschna anacantha	17	1	1	NL
Orthetrum caledonicum	35	2	1	NL
Austrolestes aleison	12	2	1	NL
Diphlebia hybridoides	17	2	2	NL
Dendroaeschna conspersa	11	2	2	NL
Archibasis mimetes	24	2	2	NL
Urothemis aliena	12	2	2	NL
Griseargiolestes albescens	15	2	2	NL
Griseargiolestes metallicus	11	2	2	NL
Austrosticta fieldi	11	2	2	NL
Austrocnemis maccullochi	54	2	2	NL
Diphlebia nymphoides	43	2	2	NL
Telephlebia tillyardi	21	2	2	NL
Austroargiolestes brookhousei	12	2	2	NL
Ictinogomphus dobsoni	11	2	2	NL
Pseudagrion cingillum	19	2	2	NL
Diplacodes haematodes	16	2	2	NL
Labidiosticta vallisi	17	2	2	NL
Parasynthemis regina	27	2	2	NL
Nannophlebia mudginberri	15	2	2	NL
Nososticta baroalba	22	2	2	NL
Hemiphlebia mirabilis	29	2	2	NL
Neosticta fraseri	19	3	3	NL
Pentathemis membranulata	15	3	3	NL
Nososticta liveringa	13	3	3	NL
Austrogomphus mjobergi	23	3	3	NL
Austrophlebia costalis	13	3	3	NL
Neosticta canescens	14	3	3	NL
Coenagrion lyelli	14	3	3	NL
Miniargiolestes minimus	34	3	3	NL
Ischnura pruinescens	63	3	3	NL
Hemicordulia continentalis	35	3	3	NL
Austrolestes io	32	3	3	NL
Gynacantha dobsoni	37	4	3	NL
Nososticta solida	56	4	3	NL
Oristicta filicicola	22	4	3	NL
Macrodiplax cora	36	4	3	NL
Archiargiolestes pusillissimus	20	4	3	NL
Austroaeschna weiskei	18	4	4	NL
Austroagrion cyane	75	4	4	NL
Griseargiolestes intermedius	11	4	4	NL
Rhadinosticta simplex	40	4	4	NL
Notoaeschna sagittata	25	4	4	NL
Nannophlebia injibandi	13	4	4	NL
Micromidia atrifrons	19	4	4	NL

Hemigomphus comitatus	20	4	4	NL
Episynlestes cristatus	11	4	4	NL
Austrogomphus divaricatus	21	4	4	NL
Austroepigomphus gordoni	17	4	4	NL
Austrolestes insularis	28	5	4	NL
Lestes concinnus	68	5	4	NL
Austrogynacantha heterogena	50	5	4	NL
Agriocnemis pygmaea	135	5	4	NL
Cordulephya pygmaea	34	5	5	NL
Aciagrion fragilis	83	5	5	NL
Austroaeschna obscura	35	5	5	NL
Austroargiolestes christine	16	5	5	NL
Eusynthemis nigra	33	5	5	NL
Nannophlebia risi	55	5	5	NL
Pseudagrion jedda	60	5	5	NL
Austroagrion exclamationis	89	6	5	NL
Ictinogomphus australis	63	6	5	NL

Butterflies (Lepidoptera)

The ANHAT database has 53246 records for 442 species and subspecies of butterflies. Fifty-five species account for approximately 50% of the total species records in ANHAT. These species have over 250 records each and *Danaus plexippus* over 1200 records.

Table 50 Butterfly species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% total records
Hesperilla ornata	259	0.49
Taractrocera papyria	262	0.49
Appias paulina	265	0.50
Hypocysta metirius	272	0.51
Dispar compacta	275	0.52
Toxidia peron	276	0.52
Signeta flammeata	281	0.53
Neolucia agricola	282	0.53
Nacaduba biocellata	283	0.53
Oreixenica kershawi	285	0.54
Hesperilla idothea	295	0.55
Psychonotis caelius	302	0.57
Papilio demoleus	316	0.59
Mycalesis terminus	322	0.60
Delias harpalyce	331	0.62
Ypthima arctous	335	0.63
Delias aganippe	338	0.63
Jalmenus evagoras	342	0.64
Theclinesthes miskini	345	0.65
Papilio anactus	349	0.66
Geitoneura acantha	352	0.66
Lampides boeticus	353	0.66
Oreixenica lathoniella	357	0.67
Graphium macleayanus	362	0.68
Hypocysta adiante	376	0.71
Polyura sempronius	380	0.71
Cressida cressida	382	0.72
Ogyris olane	399	0.75
Delias argenthona	400	0.75
Heteronympha penelope	400	0.75
Ogyris amaryllis	414	0.78
Ocybadistes walkeri	484	0.91
Delias nigrina	501	0.94
Tirumala hamata	517	0.97
Acraea andromacha	520	0.98
Vanessa itea	522	0.98
Hypolimnas bolina	565	1.06
Geitoneura klugii	589	1.11
Graphium sarpedon	614	1.15

Hesperilla donnysa	621	1.17
Eurema hecabe	627	1.18
Danaus chrysippus	690	1.30
Candalides hyacinthina	702	1.32
Junonia villida	719	1.35
Tisiphone abeona	732	1.37
Catopsilia pomona	733	1.38
Melanitis leda	766	1.44
Papilio aegeus	770	1.45
Belenois java	877	1.65
Vanessa kershawi	887	1.67
Euploea core	928	1.74
Heteronympha merope	935	1.76
Zizina labradus	1006	1.89
Danaus plexippus	1271	2.39
Total	26766	50.3

Eighty butterflies had 10 or fewer individual record sites present in the ANHAT database. One species is listed as endangered.

Table 51 Butterfly species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Arhopala micale amytis	1	100.0	NE	RF, Man	4200	NL
Deudorix epirus agimar	1	100.0	NE	RF	200	NL
Heteronympha banksii mariposa	1	100.0	E	RF, For	200	NL
Hypochrysops elgneri barnardi	1	100.0	NE	RF, For	100	NL
Philiris nitens lucina	1	100.0	NE	RF	300	NL
Praetaxila segecia	1	100.0	NE	RF	200	NL
Tellervo zoilus gelo	1	100.0	NE	RF	900	NL
Borbo cinnara	1	0.0	N	RF	600	NL
Candalides cyprotus pallescens	1	0.0	EC-SE	WL	800	NL
Catochrysops amasea	1	0.0	NE	??	700	NL
Catopyrops ancyra	1	0.0	NE	RF	700	NL
Euploea algea	1	0.0	NE	For	800	NL
Junonia erigone	1	0.0	NC	For	100	NL
Neopithecops lucifer	1	0.0	NE	RF	400	NL
Papilio aegeus ormenus	1	0.0	NE	RF	400	NL
Philiris azula	1	0.0	NE	RF	100	NL
Taractrocera ilia	1	0.0	NC	RH	700	NL
Theclinesthes onycha capricornia	1	0.0	NE	For	1700	NL
Tisiphone abeona morrisi	1	0.0	E	Gen	2700	NL
Elodina walkeri	2	50.0	N	RF, For	1300	NL
Eurema alitha	2	100.0	NC-NE	WL, GrL	1300	NL
Lexias aeropa	2	100.0	NE	RF	300	NL
Theclinesthes miskini eucalypti	2	50.0	NE	WL	2500	NL
Trapezites genevieveae	2	100.0	E	RF	200	NL

Udara tenella	2	50.0	NE	RF	200	NL
Chaetocneme critomedia	2	0.0	NE	For	400	NL
Delias ennia tindalii	2	0.0	NE	RF	200	NL
Heteronympha cordace wilsoni	2	0.0	SE	SE	500	NL
Leptosia nina	2	0.0	NW	For	400	NL
Taenaris artemis	2	0.0	NE	RF	600	NL
Appias albina	3	33.3	N	For	500	NL
Croitana aestiva	**3**	**33.3**	**CI**	**WL**	**200**	**EN**
Hesperilla crypsargyra hopsoni	3	66.7	SE	For	400	NL
Hypochrysops cleon	3	66.7	NE	RF	200	NL
Ionolyce helicon hyllus	3	66.7	NE	RF	300	NL
Apaturina erminea	3	0.0	NE	RF	100	NL
Hypolimnas anomala	3	0.0	NE	RF	600	NL
Jamides amarauge	3	0.0	NE	RF	700	NL
Leptotes plinius	3	0.0	NCI-E	WL	3000	NL
Rapala varuna simsoni	3	0.0	NE	Gen	1300	NL
Allora major	4	25.0	NE	RF	100	NL
Elodina queenslandica	4	100.0	NE	RF	1200	NL
Mesodina gracillima	4	25.0	NC	WL	1200	NL
Oreixenica latialis theddora	4	100.0	SE	GrL	200	NL
Pithecops dionisius	4	75.0	NE	RF	500	NL
Troides priamus macalpinei	4	25.0	NE	RF	600	NL
Acrodipsas melania	4	0.0	NE	WL	400	NL
Everes lacturnus australis	5	60.0	NC-SE??	For	3700	NL
Hypochrysops theon medocus	5	60.0	NE	RF	400	NL
Pseudodipsas eone	5	40.0	NE	RF, For	800	NL
Libythea geoffroy	5	0.0	N	For	2200	NL
Heteronympha banksii nevina	5	20.0	SE	RF, For	1000	NL
Jalmenus clementi	5	20.0	WC	SL	700	NL
Oreixenica kershawi kanunda	5	20.0	SE	Wet	900	NL
Zizina labradus labdalon	5	20.0	NE	Gen	700	NL
Hypochrysops apollo phoebus	6	83.3	NE	Wet	400	NL
Hypochrysops pythias euclides	6	0.0	NE	RF	700	NL
Netrocoryne repanda expansa	6	16.7	E	RF, WL	500	NL
Orsotriaena medus	6	0.0	NE	Wet	1100	NL
Borbo impar	7	42.9	NC	RF, WL	800	NL
Catochrysops panormus platissa	7	42.9	NC	For-WL	4700	NL
Catopyrops florinda halys	7	14.3	EC	RF	2600	NL
Croitana arenaria	7	42.9	CI	WL	700	NL
Ionolyce helicon	7	28.6	NE	RF	1100	NL
Jalmenus inous notocrucifer	7	0.0	SW	WL	200	NL
Nacaduba kurava parma	7	42.9	NE-EC	RF, WL	3100	NL
Petrelaea tombugensis	7	42.9	NC-NE	RF	1500	NL
Candalides delospila	8	12.5	NI	WL, GrL	1300	NL
Deudorix smilis	8	12.5	NC	For	1200	NL
Jalmenus aridus	8	0.0	SWI	SL	300	NL
Neohesperilla senta	8	12.5	N	WL, GrL	1100	NL
Pantoporia venilia	8	87.5	NE	For	1500	NL
Philiris ziska	8	50.0	NE	RF	200	NL
Toxidia rietmanni parasema	8	12.5	E	RF, For	300	NL

Acrodipsas hirtipes	9	0.0	NE	WL	400	NL
Charaxes latona	9	66.7	NE	RF	200	NL
Danaus genutia	9	0.0	NC	Wet	1100	NL
Allora doleschallii	10	10.0	NE	RF	1400	NL
Chaetocneme porphyropis	10	20.0	NE	RF	1600	NL
Jalmenus lithochroa	10	0.0	SC	WL	900	NL

Removal of the poorly recorded species leaves 52914 records in ANHAT for 362 species (and subspecies). The mean number of records per species for species with greater than 10 records was 146.2, with a mean of 24.4 for the percent of records in NRS. Of these remaining species, 46 species had 45% or greater of individual site records located within the NRS. Of those 46 species, none were listed as threatened. The majority of species had preferences for environments with trees with areas of forest and woodland dominating. Rainforest was also a prevalent habitat used by this list of species, but not greatly considering its extensive reservation and relatively large number of species known to use rainforest. Almost all of the species in the list come from eastern Australia, indicating that species from two-thirds of Australia are not well studied or recorded.

Table 52 Butterfly species with greater than 45% of site records within the NRS.

Species	Total Records	Records in NRS	Location	Veg type	Area (km^2)	EPBC status
Mimene atropatene	11	5 (45.4%)	NE	RF	200	NL
Hesperilla ornata		10			1000	
monotherm	22	(45.4%)	E	For		NL
		17			3900	
Neolucia mathewi	37	(45.5%)	SE	WL, SL		NL
		44		WL,	4500	
Oreisplanus munionga	95	(46.3%)	SE, Tas	Wet		NL
		19			3000	
Proeidosa polysema	41	(46.3%)	N	WL		NL
		95			12300	
Argynnina cyrila	205	(46.3%)	SE	RF, For		NL
Pseudalmenus		91		For,	14400	
chlorinda	196	(46.4%)	SE, Tas	WL		NL
		28			3100	
Trapezites iacchoides	60	(46.7%)	SE	For		NL
		54			7000	
Hypochrysops byzos	115	(47.0%)	SE	For		NL
		133			17100	
Signeta flammeata	281	(47.3%)	SE	For		NL
		11			1400	
Elymnias agondas	23	(47.3%)	NE	RF		NL
		12			200	
Hypochrysops hippuris	25	(48.0%)	NE	RF		NL
		16			800	
Hypocysta angustata	33	(48.5%)	NE	RF		NL
Pasma tasmanica	82	40	SW, Tas	For,	8000	NL

		(48.8%)		WL		
Theclinesthes albocincta	47	23 (49.0%)	W-SEI	WL, SL	4000	NL
Hesperilla furva	49	24 (49.0%)	CE	For, WL	2700	NL
Heteronympha mirifica	100	49 (49.0%)	SE	RF, For	7900	NL
Cethosia penthesilea	26	13 (50.0%)	NC	RF	3200	NL
Trapezites sciron eremicola	42	21 (50.0%)	S	WL, He	1400	NL
Graphium macleayanus	362	182 (50.2%)	E, Tas	RF, WL	23800	NL
Signeta tymbophora	27	14 (51.8%)	SE	RF	2900	NL
Hesperilla sarnia	46	24 (52.2%)	NE	For	1200	NL
Acrodipsas brisbanensis	136	71 (52.2%)	E-SE	For, WL	6100	NL
Candalides consimilis goodingi	17	9 (52.9%)	SE	For	1400	NL
Hypocysta euphemia	64	34 (53.1%)	SE	RH	5300	NL
Nesolycaena urumelia	11	6 (54.5%)	NC	WL	1800	NL
Toxidia andersoni	77	42 (54.5%)	SE	For	4800	NL
Appias ada	42	23 (54.8%)	NE	RF	2200	NL
Ogyris otanes	40	22 (55.0%)	SE-SC	WL	3700	NL
Anisynta dominula	156	88 (56.4%)	Tas, SE	WL, GrL	8500	NL
Jamides cyta	31	18 (58.0%)	NE	RF	500	NL
Anisynta monticolae	74	43 (58.1%)	SE	For	5000	NL
Hypochrysops elgneri	12	7 (58.3%)	NE	RF, For	800	NL
Philiris Diana	12	7 (58.3%)	NE	RF-For	1100	NL
Hypolimnas alimena lamina	17	10 (58.8%)	NE	RF	3200	NL
Hesperilla crypsargyra	149	89 (59.7%)	SE	For	3600	NL
Oreixenica latialis	69	42 (60.9%)	SE	GrL	3300	NL
Toxidia inornatus	21	13 (61.9%)	NE	RF	700	NL
Rachelia extrusa	11	7 (63.6%)	NE	RF	300	NL
Heteronympha solandri	211	135 (64.0%)	SE	WL	9800	NL

Nesoxenica leprea	159	108 (67.9%)	Tas	RF, For	5900	NL
Oreixenica orichora	117	80 (68.4%)	SE, Tas	GrL	4400	NL
Oreixenica correae	178	126 (70.8%)	SE	WL	6000	NL
Neolucia hobartensis	104	74 (71.1%)	SE, Tas	WL	5600	NL
Antipodia chaostola chares	61	44 (72.1%)	SE	For, WL	1600	NL
Nesolycaena albosericea	38	29 (76.3%)	EC	WL	2400	NL

Forty-nine species had less than 10% of ANHAT records located within PAs (**Table 53**). This represents a relatively large proportion of the identified butterflies. One of the 49 species is classified as threatened, being listed as vulnerable. The majority of species in this table again come from eastern Australia. However, there are also species from south-western Australia and species from all parts of Australia are listed. Woodland and forest species are dominant on the list. There are also 11 species that use rainforest, even though this system is well reserved. Four species have no records within the reserve system.

Table 53 Butterfly species with <10% of ANHAT records located within the NRS.

Species	No. Records	Records in NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Arrhenes marnas	32	0	0.00	NE	Wet	2000	NL
Euschemon rafflesia alba	16	0	0.00	E	RF	700	NL
Ogyris barnardi	31	0	0.00	EI	WL	1300	NL
Ogyris iphis	51	0	0.00	NE	WL	1100	NL
Vanessa cardui	89	1	1.12	SW	Gen	6400	NL
Trapezites argenteoornatus	51	1	1.96	SW	He	4300	NL
Hypochrysops halyaetus	50	1	2.00	W	WL	3400	NL
Anisynta cynone	48	1	2.08	SE	WL, GrL	2800	NL
Hypochrysops epicurus	46	1	2.17	E	Man	2200	NL
Ogyris amaryllis hewitsoni	37	1	2.70	NE	Gen	1700	NL
Jalmenus pseudictinus	36	1	2.78	NE-EC	For, WL	2000	NL
Argyreus hyperbius	29	1	3.45	E	Wet	2400	NL
Hypochrysops cyane	27	1	3.70	E	For, WL	3400	NL
Ogyris zosine	149	6	4.03	N, NI	WL	10000	NL
Acrodipsas arcana	24	1	4.17	E	For	400	NL
Hasora chromus	24	1	4.17	NC-NE	RF, Man	2800	NL
Hypolycaena danis turneri	23	1	4.35	NE	RF	900	NL

Trapezites macqueeni	23	1	4.35	NE	For, WL	1900	NL
Hypochrysops digglesii	67	3	4.48	NE-E	For, WL	4000	NL
Trapezites lutea	112	6	5.36	SE	WL	7100	NL
Ogyris amaryllis meridionalis	37	2	5.41	Aus	Gen	13800	NL
Zizula hylax attenuata	17	1	5.88	N	WL, Wet	1300	NL
Ogyris aenone	68	4	5.88	NE-E	WL	1400	NL
Deudorix diovis	100	6	6.00	NC-SE	RF, For	6600	NL
Croitana croites	49	3	6.12	SW	WL	3200	NL
Hypolimnas misippus	79	5	6.33	NC-SE	RF, For	8200	NL
Geitoneura minyas	46	3	6.52	SW	WL	6500	NL
Paralucia spinifera	**106**	**7**	**6.60**	**E**	**WL**	**1300**	**VU**
Hasora discolor	60	4	6.67	NE-EC	RF	4100	NL
Arhopala madytus	43	3	6.98	NE	RF	4100	NL
Rapala varuna	70	5	7.14	NE	Gen	4100	NL
Ogyris amaryllis	414	31	7.49	SE	Gen	26100	NL
Chaetocneme beata	40	3	7.50	E	RF	5100	NL
Hypochrysops delicia duaringae	13	1	7.69	NE	For, WL	400	NL
Mesodina cyanophracta	13	1	7.69	SW	WL	2500	NL
Hesperilla chrysotricha cyclospila	104	8	7.69	SE	Wet	3900	NL
Hesperilla flavescens	205	16	7.80	SE	Wet	4600	NL
Oreixenica ptunarra	162	13	8.02	Tas	WL, GrL	3100	NL
Hypochrysops pythias	12	1	8.33	NE	RF	1400	NL
Cephrenes trichopepla	118	10	8.47	SW-E	For, WL	9700	NL
Hypochrysops piceata	47	4	8.51	E	WL	700	NL
Ogyris abrota	176	15	8.52	E	For, WL	8900	NL
Zizula hylax	35	3	8.57	NE	WL, Wet	4900	NL
Acrodipsas myrmecophila	116	10	8.62	NC-SE	For, WL	3000	NL
Anisynta sphenosema	23	2	8.70	SW	For	2800	NL
Troides euphorion	11	1	9.09	NE	RF	1100	NL
Papilio anactus	349	32	9.17	E, EI	For, WL	22000	NL
Danaus plexippus	1271	118	9.28	Aus	Gen	49800	NL
Papilio fuscus canopus	31	3	9.68	CN	RF	2900	NL

Three butterfly species had records in more than 100 separate PAs (Table 54). One species in this list had over a thousand records, with an average of 943 records per species. None of the species are listed as threatened.

Table 54 Butterfly species recorded at more than 100 PAs.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Heteronympha merope	935	102	85	NL
Vanessa kershawi	887	101	84	NL
Zizina labradus	1006	111	100	NL

A total of 130 species had records in five or fewer PAs and 136 had records in five or fewer PAs greater than 1000 hectares in size (**Table 55**). One species is listed as vulnerable. The majority of species in this list had fewer than 100 individual record sites, and no species had more than 205 record sites. All species were recorded from at least one PA, but three species did not occur in a PA greater than 1000 hectares. None the less, there are many species that have rarely been recorded within the NRS and can be assumed to not be well protected by it.

Table 55 Butterfly species recorded from five or fewer PAs and five or fewer PAs larger than 1000 hectares.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Ogyris genoveva	19	1	0	NL
Ogyris amaryllis hewitsoni	37	1	0	NL
Trapezites argenteoornatus	51	1	0	NL
Hypochrysops elgneri	12	1	1	NL
Argyreus hyperbius	29	1	1	NL
Jalmenus pseudictinus	36	1	1	NL
Zizula hylax attenuata	17	1	1	NL
Acrodipsas arcana	24	1	1	NL
Hypochrysops pythias	12	1	1	NL
Mesodina cyanophracta	13	1	1	NL
Paralucia spinifera	**106**	**1**	**1**	**VU**
Hypochrysops halyaetus	50	1	1	NL
Hypolycaena danis turneri	23	1	1	NL
Anisynta cynone	48	1	1	NL
Hypochrysops delicia duaringae	13	1	1	NL
Trapezites macqueeni	23	1	1	NL
Ogyris amaryllis meridionalis	37	1	1	NL
Vanessa cardui	89	1	1	NL
Vagrans egista	27	1	1	NL
Troides euphorion	11	1	1	NL
Hypochrysops epicurus	46	1	1	NL
Hypochrysops cyane	27	1	1	NL

Ogyris aenone	68	1	1	NL
Hasora chromus	24	1	1	NL
Herimosa albovenata	19	1	1	NL
Hypochrysops piceata	47	2		NL
Theclinesthes hesperia	17	2	1	NL
Acrodipsas illidgei	37	2	1	NL
Nesolycaena urumelia	11	2	2	NL
Chaetocneme beata	40	2	2	NL
Chaetocneme denitza	12	2	2	NL
Cethosia penthesilea	26	2	2	NL
Mimene atropatene	11	2	2	NL
Megisba strongyle nigra	12	2	2	NL
Jamides cyta	31	2	2	NL
Hypocysta angustata	33	2	2	NL
Hypochrysops polycletus	21	2	2	NL
Hypochrysops hippuris	25	2	2	NL
Graphium aristeus	25	2	2	NL
Exometoeca nycteris	11	2	2	NL
Euploea darchia niveata	14	2	2	NL
Erysichton palmyra	27	2	2	NL
Hypochrysops polycletus rovena	13	2	2	NL
Philiris fulgens kurandae	20	2	2	NL
Rachelia extrusa	11	2	2	NL
Telicota brachydesma	19	2	2	NL
Proeidosa polysema	41	2	2	NL
Anisynta sphenosema	23	2	2	NL
Zizula hylax	35	2	2	NL
Bindahara phocides yurgama	13	3	1	NL
Acrodipsas myrmecophila	116	3	2	NL
Hesperilla sarnia	46	3	2	NL
Toxidia melania	26	3	2	NL
Tisiphone abeona rawnsleyi	25	3	2	NL
Heteronympha penelope alope	19	3	3	NL
Sabera fuliginosa	66	3	3	NL
Taractrocera dolon	30	3	3	NL
Elymnias agondas	23	3	3	NL
Mesodina aeluropis	38	3	3	NL
Euploea alcathoe	43	3	3	NL
Hypochrysops digglesii	67	3	3	NL
Hypochrysops apelles	117	3	3	NL
Hypochrysops theon	19	3	3	NL
Trapezites symmomus soma	32	3	3	NL
Eurema puella	34	3	3	NL
Deudorix democles	26	3	3	NL
Hasora hurama	18	3	3	NL
Graphium macfarlanei	19	3	3	NL
Geitoneura minyas	46	3	3	NL
Deudorix epirus	12	3	3	NL
Ogyris ianthis	58	3	3	NL
Papilio fuscus canopus	31	3	3	NL

Arhopala madytus	43	3	3	NL
Phalanta phalantha	21	3	3	NL
Appias ada	42	3	3	NL
Liphyra brassolis	23	3	3	NL
Jamides aleuas coelestis	18	3	3	NL
Jalmenus inous	23	3	3	NL
Jalmenus evagoras eubulus	18	3	3	NL
Croitana croites	49	3	3	NL
Hesperilla chrysotricha cyclospila	104	4	3	NL
Parnara amalia	50	4	3	NL
Oreixenica ptunarra	162	4	3	NL
Telicota eurotas	32	4	3	NL
Hypochrysops ignita chrysonotus	39	4	3	NL
Danis danis serapis	36	4	3	NL
Hypolimnas misippus	79	4	4	NL
Toxidia inornatus	21	4	4	NL
Delias ennia nigidius	24	4	4	NL
Hasora discolor	60	4	4	NL
Hesperilla furva	49	4	4	NL
Trapezites heteromacula	21	4	4	NL
Freyeria pulti	40	4	4	NL
Delias aruna	22	4	4	NL
Ogyris idmo	51	4	4	NL
Nacaduba cyanea arinia	25	4	4	NL
Jamides aleuas	43	4	4	NL
Hypochrysops miskini	42	4	4	NL
Candalides gilberti	16	4	4	NL
Hesperilla ornata monotherm	22	4	4	NL
Telicota ohara	29	4	4	NL
Megisba strongyle	34	4	4	NL
Hypochrysops apollo	33	4	4	NL
Jalmenus eichhorni	39	4	4	NL
Anisynta tillyardi	42	4	4	NL
Hesperilla flavescens	205	5	1	NL
Bindahara phocides	34	5	3	NL
Danis danis	86	5	4	NL
Antipodia atralba	66	5	4	NL
Antipodia chaostola	65	5	4	NL
Deudorix diovis	100	5	4	NL
Elodina perdita	45	5	4	NL
Jalmenus daemeli	82	5	4	NL
Suniana lascivia	20	5	4	NL
Antipodia dactyliota	34	5	5	NL
Candalides consimilis goodingi	17	5	5	NL
Antipodia chaostola chares	61	5	5	NL
Neohesperilla croceus	55	5	5	NL
Prosotas felderi	23	5	5	NL
Rapala varuna	70	5	5	NL
Hypolycaena danis	24	5	5	NL
Sabera caesina	86	5	5	NL

Sabera dobboe	48	5	5	NL
Pseudalmenus chlorinda zephyrus	35	5	5	NL
Nesolycaena albosericea	38	5	5	NL
Pantoporia consimilis	17	5	5	NL
Nacaduba cyanea	56	5	5	NL
Mynes geoffroyi	32	5	5	NL
Telicota anisodesma	45	5	5	NL
Theclinesthes sulpitius	54	5	5	NL
Trapezites lutea	112	6	2	NL
Parnara bada	49	6	4	NL
Ogyris zosine	149	6	4	NL
Philiris diana	12	6	5	NL
Paralucia pyrodiscus	173	7	4	NL
Ogyris otanes	40	7	5	NL
Hesperilla malindeva	80	7	5	NL
Lucia limbaria	92	8	5	NL
Theclinesthes albocincta	47	8	5	NL
Jalmenus ictinus	149	10	4	NL

Land snails (Pulmonata)

The ANHAT database has 43124 records for 1914 species and subspecies of land snails. Of these, 135 species account for almost 50% of the total species records in ANHAT. These species have over 70 records each and are identified in **Table 56**. Given snails do not generally have a high-profile among the public, this is a relatively extensive list of species with a reasonable number of records.

Table 56 Land snail species that account for almost 50% of the total species records in ANHAT.

Species	No. Records	% total records
Helicarionidae sq 3	74	0.17
Rhytididae sq 3	75	0.17
Bothriembryon sayi	75	0.17
Bothriembryon kendricki	76	0.18
Meridolum sn 18	76	0.18
Pleuroxia elfina	77	0.18
Sinumelon perinflata	77	0.18
Sinumelon dulcensis	77	0.18
Neveritis aridorum	78	0.18
Planilaoma luckmanii	78	0.18
Pedinogyra rotabilis	79	0.18
Punctidae mv 1	79	0.18
Pupillidae mv 1	79	0.18
Rhytididae mv 7	79	0.18
Nitor subrugata	80	0.19
Sphaerospira informis	81	0.19
Fastosarion freycineti	81	0.19
Hadra webbi	82	0.19
Pleuroxia oligopleura	82	0.19
Sphaerospira incei lessoni	83	0.19
Tarocystis fulva	83	0.19
Sphaerospira yulei	83	0.19
Tolgachloritis jacksoni	83	0.19
Fastosarion brazieri	84	0.19
Amimopina macleayi	84	0.19
Rhytididae sq 8	86	0.20
Lacustrelix eyrie	86	0.20
Helicarionidae cy 8	87	0.20
Victaphanta compacta	87	0.20
Parmacochlea fischeri	88	0.20
Gastrocopta stupefaciens	89	0.21
Mulathena fordei	89	0.21
Sinumelon expositum	91	0.21
Fastosarion aquila	93	0.22
Helicarionidae br 5	93	0.22
Decoriropa lirata	93	0.22
Turrisitala normalis	93	0.22

Laomavix collisi	94	0.22
Gastrocopta margaretae	95	0.22
Rhytididae ne 4	96	0.22
Galadistes ne 15	97	0.22
**Austrochloritis* location 138	97	0.22
Amplirhagada percita	98	0.23
Amplirhagada burnerensis	100	0.23
Austrochloritis victoriae	100	0.23
Saladelos commixta	101	0.23
Victaphanta lampra	101	0.23
Meridolum middenense	103	0.24
Glyptopupoides egregia	103	0.24
Coneuplecta microconus	105	0.24
Bothriembryon distinctus	106	0.25
Gastrocopta strangeana	107	0.25
Hedleyoconcha delta	107	0.25
Pupilla australis	107	0.25
Strangesta sheridani	108	0.25
Gastrocopta macdonnelli	109	0.25
Sinumelon pedasum	109	0.25
Amplirhagada napierana	110	0.26
Rhagada convicta	110	0.26
Elsothera ricei	112	0.26
Pleuroxia phillipsiana	112	0.26
Ramogenia challengeri	112	0.26
Galadistes liverpoolensis	113	0.26
Gyrocochlea planorbis	113	0.26
Semotrachia setigera	114	0.26
Magilaoma penolensis	115	0.27
Meridolum gilberti	118	0.27
Tarocystis responsivus	119	0.28
Tasmaphena sinclairi	120	0.28
Cystopelta petterdi	123	0.29
Xanthomelon obliquirugosa	123	0.29
Thersites mitchellae	125	0.29
Gloreugenia hedleyi	127	0.29
Saladelos macquariensis	128	0.30
Sphaerospira appendiculate	129	0.30
Gnarosophia bellendenkerensis	130	0.30
Saladelos dulcis	132	0.31
Meridolum ne 16	132	0.31
Xanthomelon durvillii	133	0.31
Pumilicopta kessneri	136	0.32
Nitor medioximus	136	0.32
Pernagera officeri	138	0.32
Nitor pudibunda	138	0.32
Nautiliropa omicron	139	0.32
Wilhelminaia mathildae	141	0.33
Hadra bipartite	141	0.33
Nesopupa mooreana	144	0.33

Pupisoma orcula	145	0.34
Pupoides adelaidae	147	0.34
Thersites novaehollandiae	147	0.34
Coenocharopa multiradiata	148	0.34
Sinumelon aversum	152	0.35
Coneuplecta calculosa	155	0.36
Tornatellinops jacksonensis	156	0.36
Bothriembryon bulla	158	0.37
Lamellaxis clavulinus	160	0.37
Sphaerospira blomfieldi	164	0.38
Strangesta franklandiensis	164	0.38
Pleuroxia adcockiana	164	0.38
Pupisoma circumlitum	167	0.39
Neveritis misella	167	0.39
Pernagera kingstonensis	176	0.41
Trachiopsis mucosa	183	0.42
Elsothera sericatula	185	0.43
Fastosarion virens	190	0.44
Liardetia scandens	199	0.46
Helicarion mastersi	207	0.48
Sinumelon nullarboricum	212	0.49
Rhytididae mv 3	215	0.50
Thryasona diemenensis	219	0.51
Hedleyella falconeri	220	0.51
Triboniophorus graeffei	236	0.55
Pumilicopta bifurcata	237	0.55
Helicarion cuvieri	238	0.55
Bothriembryon barrette	255	0.59
Iotula microcosmos	264	0.61
Gastrocopta pediculus	273	0.63
Succinea australis	274	0.64
Discocharopa aperta	283	0.66
Westracystis lissus	287	0.67
Caryodes dufresnii	296	0.69
Sphaerospira fraseri	315	0.73
Elsothera funereal	319	0.74
Eremopeas interioris	321	0.74
Bothriembryon dux	332	0.77
Anoglypta launcestonensis	332	0.77
Stenacapha hamiltoni	360	0.83
Sphaerospira challisi	366	0.85
Stenopylis coarctate	370	0.86
Pupoides pacificus	417	0.97
Austrorhytida capillacea	538	1.25
Xanthomelon pachystylum	547	1.27
Eremopeas tuckeri	562	1.30
Meridolum corneovirens	620	1.44
Paralaoma caputspinulae	637	1.48
Total	21745	50.45

Whilst there are a number of species of land snails with a relatively large number of records available for them, the reality is that most species have very few records available by which to assess their representation in the NRS. One thousand, one hundred and eighty seven land snails had 10 or fewer individual site records in the ANHAT database and so are not able to be practically assessed (**Table 57**). Furthermore, for many of these species, the information is so poor, it is impossible to assign them a preferred habitat. In many instances, the snail is known only by a reference number and relatively few specimens. Information on the habitats in which they were collected is not available, nor are there any observations of their habits. In this case, only very broad assumptions can be made about their requirements and any assessments made with due caution. There are so many species present in this group that essentially all areas of Australia are covered and it is not reasonably practical to point to any trends in the data. The presence of large highly localised radiations in particular genera also means that the species are highly localised and so are not likely or even able to provide large numbers of site records. Hence, the apparently large numbers of poorly recorded snails for a particular region (e.g. Kimberley) may not represent as an important region of poorly collected species as apparent (although it still can not be ignored). The listed snails encompass a broad range of habitats, but species dependent on rocky sites are present in larger numbers than may be anticipated. Species present in arid or semi-arid areas in particular are dependent on such sites and are likely to be highly endemic where rocky areas are isolated.

Table 57 Land snail species with 10 or fewer individual record sites in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
76 novae	1	0.0			100	NL
761 novae	1	0.0			100	NL
84 novae	1	0.0			100	NL
Allocharopa erskinensis	1	100.0	SE	For	300	NL
Amphidromus cognatus	1	0.0	NC	WL	100	NL
Amplirhagada 22	1	0.0	NW	RH	100	NL
Amplirhagada 24	1	0.0	NW	RH	100	NL
Amplirhagada 66	1	0.0	NW	RH	100	NL
Amplirhagada 69	1	0.0	NW	RH	100	NL
Amplirhagada 71	1	0.0	NW	RH	100	NL
Amplirhagada 72	1	0.0	NW	RH	100	NL
Amplirhagada 73	1	0.0	NW	RH	100	NL
Amplirhagada alta	1	0.0	NW	RH	100	NL
Amplirhagada constricta	1	0.0	NW		100	NL
Amplirhagada hc 1	1	0.0	NW		100	NL
Auriculastra nevillei	1	0.0	NE		100	NL
Austrochloritis br 2	1	0.0	EC		100	NL
Austrochloritis mv 9	1	0.0		RF	100	NL
Austrochloritis nn 4	1	0.0	EC	For	100	NL
Austrochloritis vc 3	1	100.0	EC	For	100	NL
**Bothriembryon* location 5	1	100.0	SW	RH	100	NL
Bothriembryon aff *barretti*	1	0.0	SW	RH	100	NL
Bothriembryon attenuata	1	100.0	SW	RH	100	NL

**Bothriembryon* location 6b	1	0.0	SW	RH	100	NL
**Bothriembryon* location 6c	1	0.0	SW	RH	100	NL
Bothriembryon brugieri	1	0.0	SW	RH	100	NL
Bothriembryon c.f. colutleyi	1	100.0	SW	RH	100	NL
Bothriembryon cf *sayi*	1	100.0	SW	RH	100	NL
Bothriembryon coalseam	1	100.0	SW	RH	100	NL
**Bothriembryon* location 8	1	0.0	SW	RH	100	NL
**Bothriembryon* location 11	1	0.0	SW	RH	100	NL
**Bothriembryon* location 12	1	0.0	SW	RH	100	NL
**Bothriembryon* location 13	1	100.0	SW	RH	100	NL
**Bothriembryon* location 17	1	0.0	SW	RH	100	NL
Bothriembryon gratwicki cf.	1	0.0	SW	RH	100	NL
Bothriembryon hamersleyensis	1	100.0	NWI	RH	100	NL
**Bothriembryon* location 21	1	0.0	NWI	RH	100	NL
**Bothriembryon* location 22	1	100.0	SW	RH	100	NL
**Bothriembryon* location 24	1	100.0	SW	RH	300	NL
Bothriembryon irwin	1	0.0	SW	RH	100	NL
Bothriembryon kojonup	1	0.0	SW	RH	100	NL
**Bothriembryon* location 26	1	100.0	SWI	RH	100	NL
**Bothriembryon* location 29	1	0.0	SW	RH	100	NL
**Bothriembryon* location 33	1	0.0	SW	RH	100	NL
**Bothriembryon* location 35	1	0.0	SWI	RH	100	NL
Bothriembryon perobesus cf.	1	0.0	SW	RH	100	NL
Bothriembryon revectus cf.	1	0.0	SW	SL	100	NL
**Bothriembryon* location 42	1	0.0	SW	RH	100	NL
Camaenidae 3	1	0.0			200	NL
Camaenidae bl 37	1	0.0	ECI		100	NL
Camaenidae bl 41	1	0.0	ECI		200	NL
Camaenidae bl 64	1	0.0	ECI		100	NL
Camaenidae bl 9	1	0.0	ECI		100	NL
Camaenidae br 6	1	0.0	EC		100	NL
Camaenidae br 7	1	100.0	EC		100	NL
Camaenidae cy 11	1	0.0	NE		100	NL
Camaenidae cy 7	1	0.0	NE		100	NL
Camaenidae mq 1	1	100.0	NE		100	NL
Camaenidae mq 4	1	0.0	NE		100	NL
Camaenidae ne 14	1	0.0	EC		200	NL
Camaenidae ne 2*0*	1	0.0	EC		100	NL
Camaenidae nn 2	1	100.0	ECI		100	NL
Camaenidae nn 4	1	0.0	ECI		100	NL
Camaenidae nn 7	1	100.0	ECI		100	NL
Camaenidae nn 8	1	100.0	ECI		100	NL
Camaenidae nn 9	1	0.0	ECI		100	NL
Camaenidae sn 11	1	100.0	EC		100	NL
Camaenidae sn 19	1	0.0	EC		100	NL
Camaenidae sn 21	1	100.0	EC		100	NL
Camaenidae sn 3	1	0.0	EC		100	NL
Camaenidae sq 12	1	0.0	EC		100	NL
Camaenidae sq 3	1	100.0	EC		100	NL

Camaenidae sq 7	1	100.0	EC		100	NL
Camaenidae st 21	1	100.0	SE		100	NL
Camaenidae wt 8	1	100.0	NE		100	NL
Cassidula aurisfelis	1	100.0	NW	Littoral	100	NL
Cassidula cf *granulosa*	1	0.0	SE	Littoral	100	NL
Cassidula cf *truncata*	1	0.0	N	Littoral	100	NL
Cassidula doliolum	1	0.0	NE-NE	Littoral	200	NL
Charopidae bl 1	1	100.0	ECI		200	NL
Charopidae bl 12	1	0.0	ECI		200	NL
Charopidae bl 13	1	100.0	ECI		100	NL
Charopidae bl 16	1	0.0	ECI		100	NL
Charopidae bl 17	1	0.0	ECI		100	NL
Charopidae bl 2*0*	1	100.0	ECI		100	NL
Charopidae bl 21	1	100.0	ECI		100	NL
Charopidae bl 24	1	0.0	ECI		100	NL
Charopidae bl 25	1	0.0	ECI		100	NL
Charopidae bl 7	1	0.0	ECI		100	NL
Charopidae bl 8	1	100.0	ECI		100	NL
Charopidae br 19	1	0.0	EC		100	NL
Charopidae br 21	1	0.0	EC		100	NL
Charopidae br 24	1	100.0	EC		100	NL
Charopidae br 41	1	0.0	EC		100	NL
Charopidae br 42	1	0.0	EC		100	NL
Charopidae br 43	1	0.0	EC		100	NL
Charopidae br 45	1	0.0	EC		100	NL
Charopidae br 9	1	0.0	EC		200	NL
Charopidae cy 1	1	0.0	NE		100	NL
Charopidae cy 3	1	0.0	NE		100	NL
Charopidae cy 5	1	0.0	NE		100	NL
Charopidae cy 6	1	0.0	NE		100	NL
Charopidae eu 3	1	0.0	NE		200	NL
Charopidae eu 4	1	0.0	NE		100	NL
Charopidae mq 16	1	0.0	NE		100	NL
Charopidae mv 1*0*	1	100.0	EC		100	NL
Charopidae mv 15	1	0.0	EC		100	NL
Charopidae mv 19	1	100.0	EC		100	NL
Charopidae mv 21	1	0.0	EC		100	NL
Charopidae mv 32	1	100.0	EC		100	NL
Charopidae mv 42	1	100.0	EC		100	NL
Charopidae mv 43	1	100.0	EC		100	NL
Charopidae ne 12	1	0.0	EC		100	NL
Charopidae ne 18	1	0.0	EC		100	NL
Charopidae ne 21	1	0.0	EC		100	NL
Charopidae ne 29	1	0.0	EC		100	NL
Charopidae ne 5	1	0.0	EC		100	NL
Charopidae ne 6	1	0.0	EC		100	NL
Charopidae nn 1*0*	1	100.0	CEI		100	NL
Charopidae nn 18	1	100.0	CEI		100	NL
Charopidae nn 19	1	100.0	CEI		100	NL
Charopidae nn 2	1	0.0	CEI		100	NL

Charopidae nn 2*0*	1	0.0	CEI		200	NL
Charopidae sn 2*0*	1	0.0	EC		100	NL
Charopidae sn 21	1	100.0	EC		100	NL
Charopidae sn 27	1	100.0	EC		100	NL
Charopidae sn 28	1	0.0	EC		100	NL
Charopidae sp b	1	100.0	NC		100	NL
Charopidae sq 35	1	100.0	EC		200	NL
Charopidae sq 36	1	100.0	EC		100	NL
Charopidae sq 37	1	0.0	EC		100	NL
Charopidae sq 4*0*	1	0.0	EC		100	NL
Charopidae sq 43	1	100.0	EC		100	NL
Charopidae sq 45	1	0.0	EC		100	NL
Charopidae sq 5	1	0.0	EC		100	NL
Charopidae sq 7	1	0.0	EC		100	NL
Charopidae st 1	1	100.0	SE		100	NL
Charopidae st 12	1	100.0	SE		100	NL
Charopidae st 16	1	0.0	SE		100	NL
Charopidae st 21	1	100.0	SE		100	NL
Charopidae st 22	1	0.0	SE		100	NL
Charopidae st 23	1	0.0	SE		100	NL
Charopidae st 28	1	0.0	SE		100	NL
Charopidae st 29	1	0.0	SE		100	NL
Charopidae wt 12	1	100.0	NE		100	NL
Charopidae wt 16	1	100.0	NE		100	NL
Charopidae wt 17	1	100.0	NE		100	NL
Charopidae wt 22	1	100.0	NE		100	NL
Charopidae wt 33	1	0.0	NE		100	NL
Charopidae wt 35	1	0.0	NE		100	NL
Charopidae wt 37	1	100.0	NE		100	NL
Charopidae wt 4	1	0.0	NE		100	NL
Charopidae wt 47	1	100.0	NE		100	NL
Charopidae wt 5*0*	1	0.0	NE		100	NL
Charopidae wt 54	1	0.0	NE		100	NL
Charopidae wt 56	1	100.0	NE		100	NL
Charopidae wt 57	1	100.0	NE		100	NL
Charopidae wt 61	1	100.0	NE		100	NL
Charopidae wt 62	1	0.0	NE		100	NL
Charopidae wt 64	1	100.0	NE		100	NL
Charopidae wt 68	1	100.0	NE		100	NL
Charopidae wt 72	1	100.0	NE		100	NL
Charopidae wt 78	1	100.0	NE		100	NL
Charopidae wt 8	1	100.0	NE		100	NL
Charopidae wt 80	1	100.0	NE		100	NL
Charopidae wt 82	1	0.0	NE		100	NL
Charopidae wt 83	1	0.0	NE		100	NL
Coricudgia wollemiana	1	0.0	EC	For	100	NL
Cupedora bitaeniatus	1	0.0	SC	RH	100	NL
Cupedora cooperi	1	0.0	SCI	RH	900	NL
Cylindrotis quadrasi	1	0.0	NC	Littoral ?	200	NL

Cystopeltidae nn 1	1	0.0	ECI		100	NL
Cystopeltidae sn 1	1	0.0	EC		100	NL
Damochlora 41	1	0.0	NW	RH	100	NL
Damochlora 42	1	0.0	NW	RH	300	NL
Delinitesta gayndahensis	1	0.0	NE	For	400	NL
Dentherona aff *tasmaniae*	1	0.0	Tas	WL	100	NL
Dipnelix pertricosa	1	100.0	SC	Sl	400	NL
Echotrida sq 1	1	100.0	EC		100	NL
Elasmias pressus	1	0.0	NC?	For	100	NL
Epinicium restifer	1	100.0	SWI	WL	100	NL
Exiligada qualis	1	0.0	NW	RH	100	NL
Expocystis 2	1	0.0	EC?		100	NL
Fastosarion bullaceus	1	100.0	NE	For	100	NL
Fastosarion strangei	1	0.0	EC	For	400	NL
Galadistes stutschburyi	1	0.0	EC	For	200	NL
Gastrocopta aff. *adelaidae*	1	0.0	SC		100	NL
Gastrocopta recondita	1	0.0	NC	RH	100	NL
Glyptorhagada bunyerooana	1	100.0	SC	RH	100	NL
Glyptorhagada pecuniosa	1	100.0	SCI	RH	100	NL
Gratilaoma cara	1	100.0	SW	WL	200	NL
Greenwoodoconcha nux	1	0.0	Norfolk Is.	WL	200	NL
Gyrocochlea aff. *prava*	1	0.0	EC	For	100	NL
Hedleyella whitei	1	0.0	NE	For	100	NL
Hedleyropa yarrangobillyensis	1	0.0	SE	RH	100	NL
Helicarion strangei	1	0.0	SE?	For?	200	NL
Helicarionidae bl 13	1	100.0	ECI		100	NL
Helicarionidae bl 19	1	100.0	ECI		100	NL
Helicarionidae bl 20	1	100.0	ECI		100	NL
Helicarionidae bl 3	1	0.0	ECI		100	NL
Helicarionidae cc 1	1	0.0	NEI		100	NL
Helicarionidae cy 7	1	0.0	NE		100	NL
Helicarionidae eu 4	1	100.0	NE		100	NL
Helicarionidae mq 14	1	0.0	NE		100	NL
Helicarionidae mq 5	1	0.0	NE		100	NL
Helicarionidae mq 6	1	0.0	NE		100	NL
Helicarionidae mv 6	1	0.0	EC		100	NL
Helicarionidae nn 11	1	0.0	ECI		100	NL
Helicarionidae nn 6	1	0.0	ECI		100	NL
Helicarionidae sn 5	1	100.0	EC		100	NL
Helicarionidae sn 9	1	0.0	EC		100	NL
Helicarionidae sq 10	1	0.0	EC		100	NL
Helicarionidae st 1	1	0.0	SE		100	NL
Helicarionidae wt 28	1	100.0	NE		100	NL
Helicarionidae wt 30	1	100.0	NE		100	NL
Insullaoma predicta	1	100.0	SW	For	200	NL
Laemodonta octanfracta	1	100.0	Aus	Man	600	NL
Laemodonta punctigera	1	100.0	EC	Man	100	NL
Lenwebbia paluma	1	100.0	NE	For	100	NL
Liardetia sculpta	1	0.0			100	NL

Luinodiscus sublesta	1	0.0	SE	WL	200	NL
Melampus fasciatus	1	0.0	NC-NE	Littoral	100	NL
Melampus flavus	1	0.0		Littoral	100	NL
Melampus granifer	1	100.0	NW, NE	Littoral	100	NL
Ningbingia laurina?	1	0.0	NW	RH	100	NL
Noctepuna poiretiana	1	0.0	NE	RF	400	NL
Ophicardelus sulcatus	1	0.0	SE	Wet	300	NL
Paralaoma predicta	1	100.0		?	100	NL
Paralaoma retinoides	1	100.0	NC	SL	200	NL
Paralaoma sn 1	1	0.0	EC		100	NL
Parmacochlea semoni	1	0.0	NE	For	100	NL
Pernagera albolabris	1	0.0			100	NL
Pillomena a	1	100.0			100	NL
Pilsbrycharopa tumida	1	0.0	NE	WL	100	NL
Pleuroxia truca	1	100.0	CI	RH	100	NL
Pravonitor cy 13	1	0.0	NE	For	100	NL
Punctidae bl 1	1	0.0	ECI		100	NL
Punctidae mq 1	1	0.0	NE		100	NL
Punctidae nn 1	1	100.0	ECI		100	NL
Punctidae st 4	1	100.	SE		100	NL
Punctidae st 5	1	100.0	SE		100	NL
Punctidae wt 1	1	0.00	NE		100	NL
Pupillidae wt 2	1	100.0	NE		100	NL
Pupisoma novae	1	100.0			100	NL
Quistrachia 1984	1	0.00	NW		100	NL
Quistrachia gc	1	0.00	NC		100	NL
Quistrachia herbertana	1	100.0	NW		100	NL
**Quistrachia* location 6	1	100.0	NW		100	NL
Rhagada 1	1	0.00	NW	RH	300	NL
Rhagada aff. *construa*	1	0.00	NW	RH	100	NL
Rhophodon colmani	1	0.00	EC	For	100	NL
Rhophodon f	1	100.0	EC	For	100	NL
Rhytididae bl 6	1	100.0	ECI		100	NL
Rhytididae mq 3	1	100.0	NE		100	NL
Rhytididae wt 7	1	0.00	NE		100	NL
Roblinella aff. *mathinnae*	1	100.0	Tas	For	100	NL
Roblinella meehan	1	0.0	Tas	For	100	NL
**Roblinella* location 42a	1	0.0	EC	For	100	NL
Semotrachia sr 1	1	0.0	CI	RH	100	NL
Semotrachia st 1	1	0.0	CI	RH	100	NL
Setobaudinia 2	1	0.0	NW	RH	100	NL
Setobaudinia 55	1	0.0	NW	RH	200	NL
Setobaudinia 57	1	0.0	NW	RH	200	NL
Setobaudinia 60	1	0.0	NW	RH	100	NL
Sharniropa borenorensis	1	0.0	EC	RH	100	NL
Sinployea intermedia	1	0.0			100	NL
Sinumelon hortulana	1	0.0	CI	RH	100	NL
Sinumelon olgana	1	100.0	CI	RH	100	NL
Sinumelon simulante	1	0.0	SEI	RH	100	NL
Sphaerospira whartoni	1	0.0	Holbourne Is.	WL	400	NL

Spurlingia gemma ?	1	0.0	NE	For	100	NL
Stenacapha d	1	100.0	Tas	For	100	NL
Steorra dougsparkesi	1	0.0			100	NL
Steorra estherlilleyae	1	0.0			200	NL
Steorra montstuartensis	1	0.0			100	NL
Strangesta sanguinolenta	1	0.0	SE	For	100	NL
Strepsitaurus milyeringus	1	100.0	WC	RH	100	NL
Succinea caurina	1	0.0			100	NL
Succinea contenta	1	0.0	SW	SL, Wet	100	NL
Tasmaphena helmsiana	1	0.0	SE	WL	300	NL
Thersites theses	1	0.0	EC	RF, For	100	NL
Torresitrachia 46	1	0.0	NW	RH	200	NL
Torresitrachia 48	1	0.0	NW	RH	300	NL
Torresitrachia blackiana	1	0.0	NW	RH	200	NL
Torresitrachia cc 1	1	0.0	NW	RH	100	NL
Torresitrachia rfs	1	100.0	NW	RH	100	NL
Trocholaoma ninguicola	1	0.0	SE	For	100	NL
Trocholaoma spiceri	1	100.0	Tas	For		NL
Allocharopa macgregor	2	0.0	SE	For	200	NL
Allocharopa okeana	2	0.0	SE, Mon	WL	500	NL
**Allocharopa* location 2	2	100.0	SE	For	200	NL
Amplirhagada 1	2	0.0	NW	RH	100	NL
Amplirhagada 18	2	100.0	NW	RH	100	NL
Amplirhagada 19	2	0.0	NW	RH	100	NL
Amplirhagada 2	2	0.0	NW	RH	100	NL
Amplirhagada 20	2	0.0	NW	RH	100	NL
Amplirhagada 21	2	0.0	NW	RH	100	NL
Amplirhagada 23	2	0.0	NW	RH	100	NL
Amplirhagada 26	2	0.0	NW	RH	100	NL
Amplirhagada 28	2	100.0	NW	RH	100	NL
Amplirhagada 29	2	100.0	NW	RH	100	NL
Amplirhagada 31	2	100.0	NW	RH	100	NL
Amplirhagada 32	2	0.0	NW	RH	100	NL
Amplirhagada 33	2	100.0	NW	RH	100	NL
Amplirhagada 35	2	0.0	NW	RH	100	NL
Amplirhagada 38	2	100.0	NW	RH	100	NL
Amplirhagada 64	2	0.0	NW	RH	400	NL
Amplirhagada 67	2	0.0	NW	RH	200	NL
Amplirhagada 74	2	0.0	NW	RH	200	NL
Amplirhagada cambridgensis	2	0.0	NW	RH	100	NL
Amplirhagada percita ignora	2	0.0	NW	RH	200	NL
Austrochloritis ne 3	2	0.0	NE	For	200	NL
Austrochloritis sn 23	2	0.0	EC	For	100	NL
Austrorhytida otwayensis	2	0.0	SE	For	100	NL
Bothriembryon 1976	2	50.0	SW	RH	300	NL
**Bothriembryon* location 6a	2	0.0	SC	RH	200	NL
**Bothriembryon* location 9	2	0.0	SW	RH	200	NL
Bothriembryon decresensis	2	0.0	SW	RH	200	NL

**Bothriembryon* location 19	2	50.0	SW	RH	200	NL
Bothriembryon gratwicki	2	50.0	SW	RH	800	NL
Bothriembryon maxwelli	2	100.0	SW	RH	200	NL
Bothriembryon minor	2	50.0	SW	RH	200	NL
**Bothriembryon* location 30	2	100.0	SW	RH	100	NL
**Bothriembryon* location 31	2	100.0	SW	RH	100	NL
**Bothriembryon* location 32	2	100.0	SW	RH	100	NL
**Bothriembryon* location 34	2	0.0	SW	RH	200	NL
Bothriembryon novae	2	50.0	SW	RH	200	NL
Bothriembryon praecelsus cf.	2	0.0	SW	RH	200	NL
Bothriembryon rothsay	2	0.0	SW	RH	300	NL
Camaenidae 1	2	0.0			400	NL
Camaenidae bl 16	2	50.0	ECI		200	NL
Camaenidae bl 23	2	50.0	ECI		200	NL
Camaenidae bl 26	2	0.0	ECI		200	NL
Camaenidae bl 34	2	100.0	ECI		200	NL
Camaenidae bl 35	2	0.0	ECI		100	NL
Camaenidae bl 36	2	0.0	ECI		100	NL
Camaenidae bl 4	2	0.0	ECI		200	NL
Camaenidae bl 40	2	0.0	ECI		300	NL
Camaenidae bl 44	2	50.0	ECI		100	NL
Camaenidae bl 7	2	50.0	ECI		200	NL
Camaenidae br 3	2	50.0	EC		300	NL
Camaenidae eu 1	2	0.0	NE		100	NL
Camaenidae eu 4	2	0.0	NE		100	NL
Camaenidae eu 5	2	100.0	NE		200	NL
Camaenidae gc 1	2	0.0	NC		100	NL
Camaenidae mv 13	2	100.0	EC		100	NL
Camaenidae ne 16	2	50.0	EC		200	NL
Camaenidae nn 1	2	0.0	ECI		100	NL
Camaenidae sn 1	2	100.0	EC		200	NL
Camaenidae sn 4	2	100.0	EC		200	NL
Camaenidae sn 5	2	0.0	EC		200	NL
Camaenidae sn 7	2	100.0	EC		200	NL
Camaenidae sq 10	2	0.0	EC		200	NL
Camaenidae st 4	2	0.0	SE		200	NL
Camaenidae vc 2	2	50.0	SE		200	NL
Charopidae bl 10	2	100.0	ECI		100	NL
Charopidae bl 14	2	0.0	ECI		200	NL
Charopidae bl 15	2	100.0	ECI		200	NL
Charopidae bl 19	2	0.0	ECI		200	NL
Charopidae bl 2	2	0.0	ECI		200	NL
Charopidae bl 23	2	0.0	ECI		200	NL
Charopidae bl 4	2	100.0	ECI		200	NL
Charopidae bl 6	2	50.0	ECI		100	NL
Charopidae br 11	2	50.0	EC		300	NL
Charopidae br 16	2	0.0	EC		200	NL
Charopidae br 36	2	50.0	EC		300	NL
Charopidae br 37	2	0.0	EC		200	NL

Charopidae br 4	2	100.0	EC	400	NL
Charopidae eu 2	2	0.0	NE	200	NL
Charopidae mq 13	2	100.0	NE	300	NL
Charopidae mq 14	2	0.0	NE	200	NL
Charopidae mq 18	2	100.0	NE	200	NL
Charopidae mv 20	2	100.0	EC	100	NL
Charopidae mv 28	2	100.0	EC	100	NL
Charopidae mv 3	2	100.0	EC	100	NL
Charopidae mv 39	2	100.0	EC	200	NL
Charopidae mv 41	2	100.0	EC	200	NL
Charopidae mv 9	2	100.0	EC	200	NL
Charopidae ne 10	2	0.0	EC	200	NL
Charopidae ne 15	2	0.0	EC	200	NL
Charopidae ne 2	2	0.0	EC	200	NL
Charopidae ne 20	2	0.0	EC	200	NL
Charopidae ne 31	2	0.0	EC	200	NL
Charopidae nn 3	2	50.0	CEI	200	NL
Charopidae nn 7	2	0.0	CEI	200	NL
Charopidae sn 1	2	0.0	EC	200	NL
Charopidae sn 15	2	100.0	EC	200	NL
Charopidae sn 16	2	100.0	EC	200	NL
Charopidae sn 22	2	0.0	EC	100	NL
Charopidae sn 3	2	50.0	EC	100	NL
Charopidae sp *f*	2	100.0	NC	200	NL
Charopidae sq 1	2	0.0	EC	200	NL
Charopidae sq 10	2	50.0	EC	200	NL
Charopidae sq 12	2	0.0	EC	300	NL
Charopidae sq 18	2	0.0	EC	100	NL
Charopidae sq 22	2	50.0	EC	300	NL
Charopidae sq 29	2	100.0	EC	200	NL
Charopidae sq 38	2	50.0	EC	200	NL
Charopidae st 14	2	0.0	SE	200	NL
Charopidae st 15	2	50.0	SE	200	NL
Charopidae st 20	2	50.0	SE	200	NL
Charopidae st 24	2	50.0	SE	200	NL
Charopidae st 3	2	0.0	SE	100	NL
Charopidae st 4	2	100.0	SE	100	NL
Charopidae st 8	2	50.0	SE	200	NL
Charopidae st 9	2	50.0	SE	200	NL
Charopidae wt 10	2	50.0	NE	200	NL
Charopidae wt 11	2	100.0	NE	200	NL
Charopidae wt 15	2	100.0	NE	200	NL
Charopidae wt 20	2	100.0	NE	100	NL
Charopidae wt 24	2	0.0	NE	100	NL
Charopidae wt 26	2	50.0	NE	200	NL
Charopidae wt 27	2	100.0	NE	100	NL
Charopidae wt 30	2	100.0	NE	200	NL
Charopidae wt 44	2	100.0	NE	200	NL
Charopidae wt 46	2	100.0	NE	200	NL
Charopidae wt 49	2	100.0	NE	200	NL

Charopidae wt 53	2	100.0	NE		200	NL
Charopidae wt 55	2	50.0	NE		200	NL
Charopidae wt 58	2	100.0	NE		100	NL
Charopidae wt 59	2	100.0	NE		100	NL
Charopidae wt 6	2	100.0	NE		200	NL
Charopidae wt 65	2	100.0	NE		200	NL
Charopidae wt 7	2	50.0	NE		200	NL
Charopidae wt 73	2	100.0	NE		100	NL
Charopidae wt 79	2	50.0	NE		100	NL
Charopidae wt 81	2	0.0	NE		200	NL
Craterodiscus pricei	2	100.0	NE	For	100	NL
Cristilabrum 1990	2	0.0	NW	RH	100	NL
Cucullarion parkini	2	0.0	EC	For	200	NL
Cupedora nottensis	2	0.0	SC	RH	100	NL
Damochlora 15	2	100.0	NW	RH	100	NL
Damochlora 4	2	0.0	NW	RH	200	NL
Danielleilona multicostata	2	0.0	NE, Mon	For	100	NL
Discomelon ne 24	2	0.0	SEI	WL, RH	100	NL
Echonitor albumenoidea	2	0.0	SC	RH	500	NL
Egilomen cochlidium	2	50.0	NC	For	300	NL
Elsothera murrayana	2	0.0	SC	WL	800	NL
Elsothera submurrayana	2	0.0	EC	For	200	NL
Galadistes bourkensis	2	0.0	ECI	WL, RH	200	NL
Gastrocopta margaretae pilbarana	2	0.0	WC	RH	100	NL
Gastrocopta servilis	2	0.0	N	Gen	400	NL
Gastrocopta tatei	2	0.0	CI	RH	300	NL
Geminoropa a	2	0.0	Tas?	For?	300	NL
Glyptorhagada carinata	2	50.0	SC	RH	400	NL
Glyptorhagada tattawuppana	2	0.0	SC	RH	100	NL
Glyptorhagada wilkawillina	2	50.0	SC, SCI	RH	300	NL
Glyptorhagada wilkawillina wilkawillina	2	100.0	SC, SCI	RH	400	NL
Granulomelon mc 1	2	0.0	CI	RH	200	NL
Hadra funiculata	2	0.0	Torres St.	RF	1000	NL
Helicarion hyalinus	2	50.0	EC	For	200	NL
Helicarionidae bl 15	2	0.0	ECI		300	NL
Helicarionidae bl 21	2	50.0	ECI		200	NL
Helicarionidae cy 5	2	100.0	NE		200	NL
Helicarionidae mq 10	2	100.0	NE		100	NL
Helicarionidae mq 2	2	50.0	NE		100	NL
Helicarionidae mq 4	2	0.0	NE		400	NL
Helicarionidae ne 3	2	100.0	EC		100	NL
Helicarionidae nn 1	2	50.0	ECI		200	NL
Helicarionidae nn 7	2	50.0	ECI		300	NL
Helicarionidae sq 8	2	0.0	EC		200	NL
Helicarionidae wt 20	2	100.0	NE		100	NL

Helicarionidae wt 22	2	100.0	NE		100	NL
Helicarionidae wt 5	2	50.0	NE		200	NL
Kimboraga 11	2	0.0	NW	RH	100	NL
Lacustrelix yerelinana	2	0.0	SCI	RH	500	NL
Letomola barrenensis	2	100.0	Tas	Sl	300	NL
Liardetia doliolum	2	0.0	NC-NE	SL	400	NL
Macrophallikaropa stenoumbilicata	2	0.0	Tas	For	100	NL
Magilaoma a	2	100.0	SE?	WL?	200	NL
Meridolum sn 14	2	100.0	EC	For	100	NL
Montanomelon angatjana	2	0.0	CI	RH	100	NL
Mulathena a	2	50.0	Tas	For	300	NL
Mulathena b	2	100.0	Tas	For	200	NL
Mussonula fallax	2	50.0	EC	For	400	NL
Mysticarion hyalina	2	50.0	EC	For	200	NL
Noctepuna poiretiana clenchi	2	0.0	NE	RF, For	200	NL
Pillomena otwayensis	2	100.0	SE	For	100	NL
Pleuroxia a	2	0.0		RH	100	NL
Pleuroxia commenta	2	0.0	SCI	RH	500	NL
Pleuroxia italowiana	2	100.0	SCI	RH	400	NL
Pleuroxia mawsoni	2	50.0	SCI	RH	400	NL
Pravonitor cy 8	2	50.0	NE	For	200	NL
Punctidae sn 2	2	0.0	EC		100	NL
Punctidae wt 3	2	0.0	NE		200	NL
Pythia undata	2	50.0		Man	300	NL
Retroterra 9	2	0.0	NW	For	200	NL
Rhagada 2	2	0.0	NW	RH	300	NL
Rhophodon elizabethae	2	50.0	EC	For	200	NL
Rhytididae bl 5	2	50.0	ECI		200	NL
Rhytididae mq 1	2	100.0	NE		200	NL
Rhytididae mv 4	2	100.0	EC		100	NL
Rhytididae mv 5	2	0.0	EC		200	NL
Rhytididae nn 1	2	0.0	EC		100	NL
Rhytididae wt 3	2	0.0	NE		100	NL
Roblinella a	2	0.0	Tas	For	200	NL
Semotrachia cr 1	2	0.0	CI	RH	200	NL
Semotrachia discoidea	2	0.0	SC	RH	200	NL
Semotrachia fr 1	2	0.0	CI	RH	200	NL
Semotrachia huckittana	2	100.0	CI	RH	100	NL
Setobaudinia 1	2	0.0	NW	RH	100	NL
Setobaudinia 3	2	0.0	NW	RH	200	NL
Setobaudinia 51	2	0.0	NW	RH	100	NL
Setobaudinia 58	2	0.0	NW	RH	200	NL
Setobaudinia 59	2	0.0	NW	RH	200	NL
Setobaudinia 6	2	0.0	NW	RH	100	NL
Setobaudinia 62	2	0.0	NW	RH	300	NL
Setomedea nudicostata	2	100.0	NE	For	100	NL
Sinumelon cooperi	2	0.0	SC	RH	500	NL
Sinumelon flindersi?	2	100.0	SC	RH	200	NL

Sinumelon hullanum	2	0.0	NCI	RH	200	NL
Sinumelon marshalli	2	0.0	NEI	RH	200	NL
Stenacapha vitriniformis	2	100.0	Tas	For	200	NL
Succineidae cy 1	2	0.0	NE		200	NL
Succineidae gc 1	2	0.0	NC		200	NL
Trocholaoma a	2	100.0			100	NL
Trochomorpha melvillensis	2	0.0	Melville Is.	For	200	NL
Victaphanta a	2	100.0	SE?	For	100	NL
Zachrysia provisoria	2	100.0	Introduced	Gen	100	NL
**Allocharopa* location 1	3	0.0	SE	WL	300	NL
Amplirhagada 30	3	0.0	NW	RH	300	NL
Amplirhagada 34	3	33.3	NW	RH	400	NL
Amplirhagada 70	3	0.0	NW	RH	100	NL
Amplirhagada alta intermedia	3	0.0	NW	RH	400	NL
Amplirhagada burrowsena	3	0.0	NW	RH	200	NL
Austrochloritis astaeus	3	66.7	NE	For	400	NL
Austrochloritis ne 2	3	0.0	NE	For	300	NL
Austrochloritis ne 8	3	0.0	NE	For	200	NL
Austrochloritis sn 12	3	33.3	EC	For	300	NL
Baudinella 8	3	0.0	NW	RH	200	NL
**Bothriembryon* location 16	3	0.0	SW	SL	600	NL
**Bothriembryon* location 20	3	66.7	SW	RH	400	NL
**Bothriembryon* location 23	3	0.0	SWI	RH	300	NL
**Bothriembryon* location 28	3	100.0	SW	RH	100	NL
Bothriembryon praecelsus	3	33.3	SW	RH	500	NL
**Bothriembryon* location 39	3	33.3	SW	RH	200	NL
Camaenidae bl 12	3	0.0	ECI		300	NL
Camaenidae bl 27	3	0.0	ECI		100	NL
Camaenidae bl 29	3	0.0	ECI		300	NL
Camaenidae bl 30	3	33.3	ECI		200	NL
Camaenidae bl 56	3	100.0	ECI		300	NL
Camaenidae bl 58	3	0.0	ECI		100	NL
Camaenidae bl 6	3	66.7	ECI		300	NL
Camaenidae bl 8	3	100.0	ECI		200	NL
Camaenidae br 2	3	100.0	EC		300	NL
Camaenidae br 5	3	0.0	EC		400	NL
Camaenidae eu 12	3	0.0	NE		200	NL
Camaenidae eu 19	3	0.0	NE		400	NL
Camaenidae eu 7	3	0.0	NE		200	NL
Camaenidae eu 8	3	0.0	NE		300	NL
Camaenidae mv 14	3	66.7	EC		400	NL
Camaenidae mv 3	3	0.0	EC		200	NL
Camaenidae ne 24	3	66.7	EC		300	NL
Camaenidae ne 5	3	0.0	EC		300	NL
Camaenidae nn 5	3	66.7	ECI		300	NL
Camaenidae sq 2	3	33.3	EC		300	NL
Charopidae bl 18	3	0.0	ECI		300	NL
Charopidae bl 9	3	0.0	ECI		300	NL
Charopidae br 18	3	33.3	EC		400	NL

Charopidae br 25	3	66.7	EC		400	NL
Charopidae br 31	3	0.0	EC		300	NL
Charopidae br 34	3	33.3	EC		400	NL
Charopidae mq 2	3	0.0	NE		300	NL
Charopidae mv 1	3	33.3	EC		200	NL
Charopidae mv 29	3	66.7	EC		200	NL
Charopidae mv 34	3	100.0	EC		200	NL
Charopidae mv 36	3	66.7	EC		200	NL
Charopidae mv 37	3	100.0	EC		200	NL
Charopidae mv 44	3	100.0	EC		100	NL
Charopidae mv 5	3	66.7	EC		200	NL
Charopidae ne 14	3	0.0	EC		300	NL
Charopidae ne 27	3	0.0	EC		300	NL
Charopidae ne 28	3	0.0	EC		300	NL
Charopidae nn 23	3	33.3	CEI		300	NL
Charopidae nn 24	3	0.0	CEI		300	NL
Charopidae sn 18	3	0.0	EC		200	NL
Charopidae sn 25	3	33.3	EC		300	NL
Charopidae sn 4	3	0.0	EC		200	NL
Charopidae sn 7	3	0.0	EC		100	NL
Charopidae sq 13	3	0.0	EC		300	NL
Charopidae sq 14	3	0.0	EC		300	NL
Charopidae sq 2	3	33.3	EC		300	NL
Charopidae sq 24	3	66.7	EC		300	NL
Charopidae sq 30	3	0.0	EC		200	NL
Charopidae sq 42	3	33.3	EC		300	NL
Charopidae sq 46	3	66.7	EC		100	NL
Charopidae sq 8	3	0.0	EC		300	NL
Charopidae sq 9	3	0.0	EC		200	NL
Charopidae st 2	3	100.0	SE		400	NL
Charopidae st 27	3	100.0	SE		200	NL
Charopidae wt 14	3	100.0	NE		100	NL
Charopidae wt 23	3	33.3	NE		100	NL
Charopidae wt 3	3	0.00	NE		300	NL
Charopidae wt 31	3	66.7	NE		300	NL
Charopidae wt 38	3	33.3	NE		400	NL
Charopidae wt 41	3	0.0	NE		300	NL
Charopidae wt 43	3	100.0	NE		300	NL
Charopidae wt 45	3	100.0	NE		300	NL
Charopidae wt 52	3	100.0	NE		100	NL
Charopidae wt 76	3	33.3	NE		200	NL
Cralopa kaputarensis	3	66.7	EC-SE	For	200	NL
Cystopelta nn 1	3	66.7	ECI		300	NL
Cystopeltidae nn 2	3	33.3	ECI		300	NL
Damochlora millepunctata	3	0.0	NW	RH	200	NL
Eclipsena elleryi	3	66.7	NE		500	NL
Fastosarion aquavitae	3	0.0	NE	For	400	NL
Glyptorhagada 2	3	0.0	SC		300	NL
Glyptorhagada euglypta	3	0.0	SCI	SL, RH	400	NL
Glyptorhagada wilkawillina	3	0.0	SC, SCI	RH	400	NL

umbillicata						
Gyrocochlea convoluta	3	33.3	EC	For	400	NL
Helicarion porrectus	3	66.7	EC	For	200	NL
Helicarionidae bl 18	3	0.0	ECI		300	NL
Helicarionidae bl 6	3	0.0	ECI		400	NL
Helicarionidae bl 8	3	0.0	ECI		300	NL
Helicarionidae cy 11	3	0.0	NE		300	NL
Helicarionidae cy 12	3	66.7	NE		300	NL
Helicarionidae eu 5	3	0.0	NE		400	NL
Helicarionidae mq 11	3	33.3	NE		400	NL
Helicarionidae mq 13	3	0.0	NE		300	NL
Helicarionidae nn 10	3	0.0	ECI		300	NL
Helicarionidae nn 3	3	100.0	ECI		300	NL
Helicarionidae sn 4	3	66.7	EC		300	NL
Helicarionidae sq 14	3	100.0	EC		100	NL
Helicarionidae sq 6	3	100.0	EC		100	NL
Helicarionidae wt 14	3	66.7	NE		200	NL
Helicarionidae wt 16	3	100.0	NE		300	NL
Melampus cf *castaneus*	3	0.0	NW-NE	Littoral	300	NL
Melocystis exclusus	3	33.3	EC	For	200	NL
Mysticarion leucospira	3	0.0	EC	For	200	NL
Ngairea levicostata	3	100.0	EC	For	200	NL
Pasmaditta jungermanniae	3	0.0	Tas	WL	300	NL
Pedicamista a	3	33.3	Tas	WL	300	NL
Pernagera lena	3	100.0	SW	WL	300	NL
Pleuroxia abstans	3	66.7	WC	RH	200	NL
Pleuroxia carmeena	3	0.0	SCI	RH	200	NL
Pleuroxia musga	3	0.0	SCI	RH	300	NL
Punctidae bl 2	3	100.0	ECI		200	NL
Punctidae ne 1	3	66.7	ECI		300	NL
Pupilla ficulnea	3	33.3	NCI	RH	400	NL
Pupillidae st 1	3	66.7	SE		300	NL
Pupillidae wt 1	3	66.7	NE		300	NL
Rhachistia histrio	3	33.3	NE	For	1000	NL
Rhagada crystalla	3	0.0	NW	RH	200	NL
Rhophodon paucidentata	3	100.0	EC	For	200	NL
Rhytididae bl 8	3	0.0	ECI		300	NL
Rhytididae cy 2	3	33.3	NE		200	NL
Rhytididae sq 1	3	33.3	EC		300	NL
Rhytididae wt 2	3	66.7	NE		200	NL
Rhytididae wt 5	3	100.0	NE		200	NL
Semotrachia illarana	3	0.0	CI	RH	200	NL
Semotrachia illbilleeana	3	0.0	CI	RH	100	NL
Semotrachia jinkana	3	0.0	CI	RH	100	NL
Semotrachia mannensis	3	0.0	SCI	RH	200	NL
Setobaudinia 56	3	66.7	NW	RH	300	NL
Setobaudinia 61	3	0.0	NW	RH	300	NL
Sinumelon schevilli	3	0.0	CI	RH	400	NL
Sphaerospira mossmani	3	33.3	NE		200	NL
Stenacapha b	3	0.0	Tas	For	300	NL

Steorra hannahrichardsae	3	33.3			300	NL
Strangesta strangei	3	0.0	EC	For	2100	NL
Succineidae mv 1	3	0.0	EC		200	NL
Tatemelon inexpectatum	3	0.0	SC	RH	200	NL
Thryasona aff. *diemenensis*	3	33.3	Tas	For, WL	200	NL
Torresitrachia 45	3	0.0	NW	RH	200	NL
Triboniophorus sn 1	3	33.3	EC		200	NL
4a novae	4	75.0			300	NL
Amplirhagada 17	4	0.0	NW	RH	200	NL
Amplirhagada 25	4	0.0	NW	RH	200	NL
Amplirhagada 36	4	0.0	NW	RH	200	NL
Amplirhagada combeana	4	0.0	Cassini Is.	RH	100	NL
Amplirhagada katerana	4	0.0	NW	WL, SL	500	NL
Austrochloritis ne 12	4	0.0	NE	For	400	NL
Austrochloritis ne 5	4	0.0	NE	For	300	NL
Austrochloritis nundinalis	4	0.0	EC	For	300	NL
Austrochloritis pusilla	4	50.0	NE	For	500	NL
Basedowena olgana	4	75.0	CI	RH	200	NL
Baudinella 7	4	50.0	NW	RH	200	NL
**Bothriembryon* location 18	4	0.0	SW	RH	500	NL
**Bothriembryon* location 25	4	0.0	SW	RH	400	NL
**Bothriembryon* location 26a	4	0.0	SW	RH	200	NL
Camaenidae bl 11	4	100.0	ECI		200	NL
Camaenidae bl 14	4	0.0	ECI		500	NL
Camaenidae bl 22	4	0.00	ECI		400	NL
Camaenidae bl 24	4	75.0	ECI		200	NL
Camaenidae bl 38	4	0.0	ECI		100	NL
Camaenidae bl 46	4	0.0	ECI		200	NL
Camaenidae bl 48	4	100.0	ECI		400	NL
Camaenidae bl 57	4	0.0	ECI		400	NL
Camaenidae bl 62	4	0.0	ECI		300	NL
Camaenidae bl 65	4	25.0	ECI		300	NL
Camaenidae br 4	4	50.0	EC		400	NL
Camaenidae cc 1	4	0.0	NEI		500	NL
Camaenidae cy 6	4	0.0	NE		300	NL
Camaenidae ne 23	4	50.0	EC		200	NL
Camaenidae ne 6	4	0.0	EC		300	NL
Camaenidae sn 13	4	50.0	EC		500	NL
Camaenidae sn 8	4	75.0	EC		500	NL
Camaenidae sq 17	4	0.0	EC		400	NL
Camaenidae wt 1	4	100.0	NE		100	NL
Camaenidae wt 4	4	100.0	NE		200	NL
Charopidae bl 5	4	0.0	ECI		300	NL
Charopidae br 17	4	25.0	EC		300	NL
Charopidae br 20	4	0.0	EC		200	NL
Charopidae br 30	4	50.0	EC		400	NL
Charopidae br 8	4	25.0	EC		400	NL

Charopidae cy 4	4	0.0	NE		300	NL
Charopidae cy 8	4	0.0	NE		400	NL
Charopidae eu 1	4	0.0	NE		300	NL
Charopidae mq 12	4	25.0	NE		800	NL
Charopidae mq 3	4	25.0	NE		300	NL
Charopidae mq 4	4	25.0	NE		300	NL
Charopidae mv 16	4	0.0	EC		300	NL
Charopidae mv 18	4	75.0	EC		400	NL
Charopidae mv 2	4	0.0	EC		300	NL
Charopidae mv 27	4	100.0	EC		300	NL
Charopidae mv 40	4	100.0	EC		200	NL
Charopidae mv 46	4	25.0	EC		300	NL
Charopidae mv 8	4	50.0	EC		300	NL
Charopidae ne 11	4	50.0	EC		300	NL
Charopidae ne 13	4	0.0	EC		400	NL
Charopidae ne 25	4	0.0	EC		400	NL
Charopidae ne 26	4	0.0	EC		400	NL
Charopidae ne 3	4	50.0	EC		300	NL
Charopidae ne 7	4	0.0	EC		300	NL
Charopidae ne 9	4	75.0	EC		200	NL
Charopidae nn 12	4	25.0	CEI		500	NL
Charopidae nn 13	4	75.0	CEI		400	NL
Charopidae sn 19	4	50.0	EC		200	NL
Charopidae sp e	4	25.0	NC		400	NL
Charopidae sq 11	4	50.0	EC		400	NL
Charopidae sq 16	4	0.0	EC		200	NL
Charopidae sq 21	4	0.0	EC		300	NL
Charopidae sq 31	4	0.0	EC		300	NL
Charopidae sq 34	4	0.0	EC		300	NL
Charopidae sq 44	4	0.0	EC		500	NL
Charopidae st 10	4	75.0	SE		400	NL
Charopidae st 11	4	75.0	SE		200	NL
Charopidae st 18	4	0.0	SE		400	NL
Charopidae st 19	4	75.0	SE		400	NL
Charopidae st 6	4	75.0	SE		200	NL
Charopidae st 7	4	75.0	SE		200	NL
Charopidae wt 1	4	25.0	NE		200	NL
Charopidae wt 18	4	100.0	NE		200	NL
Charopidae wt 29	4	0.0	NE		300	NL
Charopidae wt 32	4	50.0	NE		400	NL
Charopidae wt 36	4	75.0	NE		400	NL
Charopidae wt 40	4	75.0	NE		400	NL
Charopidae wt 51	4	100.0	NE		300	NL
Charopidae wt 71	4	100.0	NE		400	NL
Charopidae wt 9	4	100.0	NE		100	NL
Cristilabrum kessneri	4	25.0	NW	RH	300	NL
Cristilabrum rectum	4	0.0	NW	RH	100	NL
Cupedora marcidum	4	0.0	SWI	RH	500	NL
Cystopelta astra	4	75.0	SE	WL	400	NL
Diphyropa macleayana	4	50.0			400	NL

Divellomelon hillieri	4	0.0	NCI	RH	300	NL
Galadistes marcescens	4	0.0	EC	For	600	NL
Galadistes st 6	4	0.0	SE		300	NL
Gyliotrachela catherina	4	25.0	NC	RH	300	NL
Gyliotrachela napierana	4	0.0	NW	RH	400	NL
Helicarion freycineti	4	50.0	EC	For, WL	400	NL
Helicarionidae bl 14	4	75.0	ECI		400	NL
Helicarionidae bl 17	4	0.0	ECI		200	NL
Helicarionidae bl 5	4	75.0	ECI		400	NL
Helicarionidae cy 3	4	0.0	NE		400	NL
Helicarionidae mq 12	4	0.0	NE		400	NL
Helicarionidae sn 7	4	50.0	EC		300	NL
Helicarionidae sn 8	4	75.0	EC		400	NL
Helicarionidae wt 17	4	100.0	NE		100	NL
Helicarionidae wt 2	4	50.0	NE		400	NL
Helicarionidae wt 24	4	0.0	NE		300	NL
Kimboraga 12	4	0.0	NW	RH	200	NL
Kimboraga yampiensis	4	0.0	NW	Gen	700	NL
Macrophallikaropa depressispira	4	100.0	Tas	For	200	NL
Meridolum ne 21	4	0.0	EC	For	400	NL
Mesodontrachia desmonda	4	0.0	NW	RH	200	NL
Nesopupa novopommerana	4	25.0	NC	For	400	NL
Offachloritis dryanderensis	4	25.0	NE	For	200	NL
Pedicamista coesus	4	75.0	Tas	WL	700	NL
Pernagera albanensis	4	100.0	SW	For, WL	700	NL
Pleuroxia arcigerens	4	0.0	SCI	RH	1100	NL
Posorites turneri	4	75.0	EC	For	400	NL
Prolesophanta a	4	75.0	Tas?	For	200	NL
Pupillidae mv 2	4	50.0	EC		400	NL
Pupoides lepidulus	4	0.0	NW	RH	400	NL
Rhagada dampierana	4	100.0	NW	RH	200	NL
Rhagada minima	4	100.0	NW	RH	300	NL
Rhagada plicata	4	50.0	Montebello Is.	RH	300	NL
Rhytididae bl 4	4	0.0	ECI		300	NL
Rhytididae mq 2	4	25.0	NE		400	NL
Semotrachia strangwayana	4	25.0	CI	RH	200	NL
Setobaudinia pagoana	4	0.0	NW	RH	300	NL
Setobaudinia victoriana	4	0.0	NW	Wet, RH	200	NL
Sphaerospira bellaria	4	100.0	NE		500	NL
Sphaerospira bencarlessi	4	50.0	NE		200	NL
Sphaerospira mulgravensis	4	50.0	NE		600	NL
Steorra jimfergusoni	4	50.0			400	NL
Strangesta harriettae	4	75.0			400	NL
Theskelomensor creon	4	75.0	NE	For	400	NL
Torresitrachia 2	4	0.0	NW	RH	300	NL
Torresitrachia thedana	4	0.0	NW	RH	400	NL

Westraltrachia ascita	4	0.0	NW	RH	200	NL
Westraltrachia porcata	4	0.0	NW	RH	200	NL
Westraltrachia subtila	4	25.0	NW	RH	200	NL
Xanthomelon rfs	4	25.0	N	RH	400	NL
Amplirhagada 42	5	60.0	NW	RH	400	NL
Amplirhagada alta alta	5	0.0	NW	RH	300	NL
Amplirhagada astuta	5	0.0	Koolan Is.	RH	100	NL
Amplirhagada montalivetensis	5	0.0	West Montalivet Is.		300	NL
Austrochloritis mv 10	5	20.0		RF	300	NL
Austrochloritis mv 11	5	80.0		RF	100	NL
Austrochloritis ne 11	5	40.0	NE	For	400	NL
Austrochloritis ne 6	5	20.0	NE	For	500	NL
Bothriembryon 1974	5	60.0	SW	RH	600	NL
Bothriembryon irvineanus	5	0.0	SW	SL	200	NL
**Bothriembryon* location 26b	5	20.0	SW	RH	500	NL
**Bothriembryon* location 40	5	0.0	SW	RH	100	NL
Camaenidae 76	5	40.0			600	NL
Camaenidae bl 10	5	0.0	ECI		600	NL
Camaenidae bl 50	5	40.0	ECI		400	NL
Camaenidae bl 61	5	0.0	ECI		400	NL
Camaenidae bl 63	5	0.0	ECI		300	NL
Camaenidae eu 16	5	100.0	NE		200	NL
Camaenidae eu 6	5	100.0	NE		200	NL
Camaenidae mv 12	5	0.0	EC		200	NL
Camaenidae mv 5	5	100.0	EC		300	NL
Camaenidae mv 6	5	100.0	EC		300	NL
Camaenidae mv 7	5	20.0	EC		400	NL
Camaenidae ne 7	5	40.0	EC		300	NL
Camaenidae sq 6	5	60.0	EC		400	NL
Camaenidae st 5	5	20.0	SE		300	NL
Camaenidae st 9	5	0.0	SE		400	NL
Cassidula nucleus	5	60.0	NE-EC	Littoral	500	NL
Cassidula rugata	5	40.0	N	Littoral	1000	NL
Charopidae bl 11	5	40.0	ECI		600	NL
Charopidae br 22	5	20.0	EC		700	NL
Charopidae br 5	5	40.0	EC		700	NL
Charopidae mq 15	5	20.0	NE		600	NL
Charopidae mq 7	5	20.0	NE		1100	NL
Charopidae mq 8	5	40.0	NE		600	NL
Charopidae mq 9	5	40.0	NE		400	NL
Charopidae mv 11	5	0.0	EC		400	NL
Charopidae mv 12	5	80.0	EC		400	NL
Charopidae mv 13	5	60.0	EC		500	NL
Charopidae mv 14	5	100.0	EC		200	NL
Charopidae ne 1	5	0.0	EC		300	NL
Charopidae ne 16	5	0.0	EC		400	NL
Charopidae sn 9	5	0.0	EC		400	NL
Charopidae sp *c*	5	40.0	NC		300	NL

Charopidae sq 19	5	60.0	EC		400	NL
Charopidae sq 3	5	0.0	EC		600	NL
Charopidae sq 39	5	20.0	EC		300	NL
Charopidae st 17	5	100.0	SE		400	NL
Charopidae wt 2	5	100.0	NE		400	NL
Charopidae wt 21	5	100.0	NE		100	NL
Charopidae wt 25	5	100.0	NE		300	NL
Charopidae wt 28	5	100.0	NE		300	NL
Charopidae wt 63	5	60.0	NE		200	NL
Charopidae wt 66	5	80.0	NE		200	NL
Charopidae wt 69	5	100.0	NE		400	NL
Charopidae wt 74	5	80.0	NE		300	NL
Cristilabrum bilarnium	5	0.0	NW	RH	300	NL
Cystopeltidae st 1	5	40.0	SE		300	NL
Discocharopa ? novae	5	20.0		?	300	NL
Echonitor cyrtochila	5	40.0	SC	RH	1300	NL
Fastosarion robusta	5	0.0	EC	For	600	NL
Galadistes ne 22	5	0.0	EC		500	NL
Galadistes st 7	5	20.0	SE		500	NL
Glyptorhagada 1	5	80.0	SC		100	NL
Helicarionidae bl 4	5	80.0	ECI		500	NL
Helicarionidae cy 6	5	0.0	NE		200	NL
Helicarionidae sq 9	5	0.0	EC		300	NL
Helicarionidae wt 19	5	60.0	NE		200	NL
Iotula kempseyensis	5	40.0	EC	For	500	NL
Laemodonta typica	5	20.0	EC	Man	600	NL
Meridolum bennetti	5	20.0	ECI	For, WL	500	NL
Mesodontrachia cockburnensis	5	0.0	NW	RH	300	NL
Monteithosites helicostracum	5	20.0	NE	For	400	NL
Ningbingia australis elongata	5	0.0	NW	RH	100	NL
Oreokera nimbus	5	100.0	NE, Mon	For	200	NL
Oreomava otwayensis	5	40.0	SE	For	1800	NL
Pernagera waterfall	5	20.0	?	?	300	NL
Pillomena marysvillensis	5	40.0	SE	For	700	NL
Plectorhagada meilgana	5	0.0	WC	RH	500	NL
Punctidae eu 1	5	20.0	NE		400	NL
Punctidae mq 2	5	60.0	NE		600	NL
Pupillidae bl 1	5	20.0	ECI		500	NL
Rhagada aff. *dringi*	5	0.0	NW	RH	500	NL
Rhagada cygna	5	0.0	NW	RH	500	NL
Rhagada intermedia	5	80.0	NW	RH	400	NL
Rhagada mimika	5	0.0	NW	RH	600	NL
Rhophodon peregrinus	5	40.0	EC	RF, For	600	NL
Rhytididae sn 3	5	20.0	EC		400	NL
Semotrachia filixiana	5	20.0	CI	RH	400	NL
Semotrachia minuta	5	0.0	CI	RH	200	NL

Semotrachia runutjirbana	5	100.0	CI	RH	100	NL
Sinumelon finitinum	5	0.0	SEI	RH	500	NL
Steorra tomsoni	5	40.0			300	NL
Succinea sn 1	5	0.0	EC		500	NL
Tasmaphena a	5	20.0			500	NL
Thryasona a	5	80.0	Tas?	For, WL	400	NL
Torresitrachia 3	5	0.0	NW	RH	400	NL
Triboniophorus nn 1	5	20.0	ECI		400	NL
Vidumelon wattii	5	20.0	CI	RH	200	NL
Westralaoma aprica	5	20.0	SW	SL	300	NL
Westraltrachia instita	5	60.0	NW	RH	500	NL
Allocharopa brazieri	6	83.3	EC	For	700	NL
Amplirhagada 27	6	0.0	NW	RH	300	NL
Auriculastra subula	6	0.0	NE	Littoral	500	NL
Austrochloritis br 3	6	33.3	EC		500	NL
Austrochloritis ne 1	6	33.3	NE	For	500	NL
Austrochloritis ne 10	6	50.0	NE	For	500	NL
Austrochloritis ne 9	6	0.0	NE	For	400	NL
Austrochloritis nn 3	6	16.7	EC	For	500	NL
Austrochloritis sn 1	6	50.0	EC	For	500	NL
**Bothriembryon* location 15	6	66.7	SW	RH	400	NL
**Bothriembryon* location 27	6	100.0	SW	RH	300	NL
**Bothriembryon* location 36	6	100.0	SW	RH	100	NL
Camaenidae bl 19	6	33.3	ECI		400	NL
Camaenidae bl 20	6	0.0	ECI		700	NL
Camaenidae bl 31	6	83.3	ECI		200	NL
Camaenidae bl 32	6	33.3	ECI		500	NL
Camaenidae bl 39	6	0.0	ECI		400	NL
Camaenidae bl 45	6	0.0	ECI		700	NL
Camaenidae bl 5	6	0.0	ECI		600	NL
Camaenidae eu 9	6	0.0	NE		500	NL
Camaenidae mv 9	6	0.0	EC		500	NL
Camaenidae sn 16	6	50.0	EC		300	NL
Camaenidae sn 17	6	0.0	EC		500	NL
Camaenidae st 1	6	0.0	SE		500	NL
Camaenidae st 2	6	83.3	SE		500	NL
Charopidae br 26	6	16.7	EC		600	NL
Charopidae br 7	6	66.7	EC		600	NL
Charopidae mq 1	6	50.0	NE		700	NL
Charopidae mq 6	6	50.0	NE		600	NL
Charopidae sn 11	6	33.3	EC		600	NL
Charopidae sq 20	6	83.3	EC		200	NL
Charopidae wt 19	6	100.0	NE		400	NL
Charopidae wt 60	6	100.0	NE		400	NL
Charopidae wt 67	6	83.3	NE		200	NL
Charopidae wt 70	6	100.0	NE		400	NL
Cooperconcha centralis	6	50.0	SCI	RH	400	NL
Cupedora yappalana	6	0.0	SC	RH	600	NL
Dirutrachia sublevata	6	0.0	CI	RH	1100	NL

Elsothera a	6	66.7	EC		600	NL
Elsothera genithecata	6	66.7	EC	For	1000	NL
Gyrocochlea eurythma	6	0.0	EC	For	500	NL
Hadra wilsoni	6	100.0	NW	RH	300	NL
Hedleyoconcha ailaketoae	6	100.0	NE	For	300	NL
Helicarionidae bl 1	6	0.0	ECI		400	NL
Helicarionidae br 3	6	50.0	EC		200	NL
Helicarionidae br 4	6	83.3	EC		300	NL
Helicarionidae cy 2	6	0.0	NE		500	NL
Helicarionidae mq 1	6	33.3	NE		800	NL
Helicarionidae ne 6	6	0.0	EC		600	NL
Helicarionidae sn 2	6	0.0	EC		400	NL
Kimboraga yammerana	6	0.0	NW	RH	200	NL
Noctepuna mayana	6	83.3	NE	For	600	NL
Obsteugenia inflecta	6	33.3	NE	For	600	NL
Ordtrachia elegans	6	0.0	NE	RH	200	NL
Paralaoma b	6	33.3			600	NL
**Pernagera* location 4	6	0.0			500	NL
Punctidae wt 2	6	83.3	NE		600	NL
Pythia scarabaeus	6	50.0	NE	Man, WL	700	NL
Rhytididae eu 1	6	0.0	NE		300	NL
Rhytididae ne 1	6	66.7	EC		200	NL
Rhytididae wt 4	6	16.7	NE		600	NL
Rhytididae wt 6	6	66.7	NE		300	NL
Roblinella b	6	66.7	Tas	WL	400	NL
Semotrachia winneckeana	6	100.0	CI	RH	300	NL
Sinumelon hamiltoni	6	33.3	CI	RH	1100	NL
Sinumelon subfodinale	6	0.0	SEI	RH	800	NL
Sphaerospira arthuriana	6	83.3	NE	WL	500	NL
Torresitrachia pc 1	6	0.0	NW	RH	600	NL
Westralaoma expicta	6	0.0	SW	SL	100	NL
Amplirhagada questroana	7	0.0	NW	WL, SL	300	NL
Annoselix dolosa	7	14.3	SW	For, WL	700	NL
Austrochloritis buxtoni	7	0.0	Thursday Is.	RF	1100	NL
Basedowena katjawarana	7	0.0	SCI	RH	300	NL
Bischoffena bischoffensis	7	42.4	Tas	For	600	NL
Bothriembryon angasianus	7	14.3	SC	RH	900	NL
Bothriembryon location 10	7	71.4	SW	RH	600	NL
Bothriembryon location 38	7	42.9	SW	RH	400	NL
Camaenidae bl 15	7	14.3	ECI		900	NL
Camaenidae bl 25	7	0.0	ECI		100	NL
Camaenidae bl 43	7	28.6	ECI		700	NL
Camaenidae cy 1	7	85.7	NE		600	NL
Camaenidae cy 5	7	14.3	NE		700	NL
Camaenidae eu 15	7	0.0	NE		500	NL
Camaenidae mv 10	7	0.0	EC		100	NL
Camaenidae ne 4	7	0.0	EC		600	NL
Camaenidae sq 11	7	14.3	EC		800	NL

Camaenidae st 3	7	85.7	SE		200	NL
Charopidae br 14	7	71.4	EC		300	NL
Charopidae br 27	7	28.6	EC		600	NL
Charopidae mv 38	7	85.7	EC		500	NL
Charopidae ne 17	7	14.3	EC		600	NL
Charopidae ne 24	7	14.3	EC		600	NL
Charopidae ne 4	7	0.0	EC		700	NL
Charopidae nn 11	7	42.9	CEI		700	NL
Charopidae nn 17	7	14.3	CEI		600	NL
Charopidae nn 9	7	42.9	CEI		600	NL
Charopidae sn 2	7	42.9	EC		600	NL
Charopidae sn 24	7	28.6	EC		600	NL
Charopidae sn 8	7	14.3	EC		500	NL
Charopidae sq 26	7	14.3	EC		500	NL
Charopidae sq 6	7	28.6	EC		600	NL
Charopidae wt 13	7	100.0	NE		100	NL
Charopidae wt 48	7	85.7	NE		800	NL
Charopidae wt 75	7	100.0	NE		600	NL
Coenocharopa alata	7	71.4	E	For	1100	NL
Cystopeltidae ne 1	7	14.3	EC		500	NL
Dentherona illustra	7	71.4	SE	For	800	NL
Echotrida sq 4	7	42.9	EC		700	NL
Elsothera nautilodea	7	0.0	EC	For	900	NL
Elsothera sn 10	7	0.0	EC		200	NL
Glyptorhagada janaslini	7	42.9	SC, SCI	RH	300	NL
Glyptorhagada umberatana	7	0.0	SCI	RH	1000	NL
Granulomelon arcigerans	7	0.0	CI	RH	400	NL
Granulomelon grandituberculata	7	0.0	CI	RH	300	NL
Gyrocochlea conferta	7	0.0	EC	For	500	NL
Gyrocochlea paucilamellata	7	0.0	EC	For	300	NL
Helicarionidae bl 2	7	14.3	ECI		900	NL
Helicarionidae bl 7	7	0.0	ECI		400	NL
Helicarionidae cy 1	7	71.4	NE		500	NL
Helicarionidae cy 4	7	0.0	NE		600	NL
Helicarionidae mv 3	7	28.6	EC		600	NL
Helicarionidae nn 2	7	57.1	ECI		500	NL
Helicarionidae sn 6	7	28.6	EC		600	NL
Helicarionidae wt 21	7	42.9	NE		700	NL
Helicarionidae wt 26	7	100.0	NE		300	NL
Marinula xanthostoma	7	0.0	SW-SE, Tas	Wet	1400	NL
Meliobba shafferyi	7	42.9	NE	For	400	NL
Neveritis interna	7	57.1	ECI	WL	600	NL
Ordtrachia septentrionalis	7	0.0	NE	RH	200	NL
Peloparion submissus	7	57.1	EC	For	400	NL
Quistrachia montebelloensis	7	71.4	Montebello Is.	RH	700	NL
Rhagada elachystoma	7	57.1	NW	RH	500	NL
Rhagada gibbensis	7	0.0	NW	RH	200	NL
Rhagada perprima	7	100.0	NW	RH	500	NL
Rhytididae mv 6	7	28.6	EC		600	NL

Rhytididae ne 6	7	57.1	EC		500	NL
Roblinella mathinnae	7	57.1	Tas	For	400	NL
Semotrachia rossana	7	0.0	CI	RH	500	NL
Setobaudinia collingii	7	14.3	NW	RH	600	NL
Sphaerospira mortenseni	7	0.0	NE	For	600	NL
Torresitrachia 1	7	0.0	NW	RH	400	NL
Amplirhagada imitata	8	0.0	NW		700	NL
Austrochloritis sn 9	8	0.0	EC	For	200	NL
Bothriembryon betttie	8	50.0	SW	RH	800	NL
Bothriembryon busselton-bunbury	8	0.0	SW	RH	300	NL
Bothriembryon jacksoni	8	75.0	SW	RH	800	NL
**Bothriembryon* location 37	8	100.0	SW	RH	600	NL
Bothriembryon spenceri	8	87.5	NC	RH	800	NL
Camaenidae bl 59	8	0.0	ECI		1000	NL
Camaenidae br 1	8	37.5	EC		1200	NL
Camaenidae eu 10	8	50.0	NE		500	NL
Camaenidae mq 2	8	62.5	NE		700	NL
Camaenidae sn 6	8	37.5	EC		600	NL
Camaenidae sq 1	8	87.5	EC		600	NL
Camaenidae st 8	8	0.0	SE		600	NL
Camaenidae wt 2	8	50.0	NE		400	NL
Camaenidae wt 3	8	100.0	NE		600	NL
Charopidae bl 3	8	62.5	ECI		800	NL
Charopidae br 13	8	37.5	EC		500	NL
Charopidae br 23	8	0.0	EC		300	NL
Charopidae br 6	8	37.5	EC		900	NL
Charopidae mv 24	8	37.5	EC		600	NL
Charopidae mv 26	8	25.0	EC		300	NL
Charopidae ne 22	8	12.5	EC		800	NL
Charopidae nn 22	8	50.0	CEI		800	NL
Charopidae nn 4	8	62.5	CEI		700	NL
Charopidae sn 17	8	37.5	EC		800	NL
Charopidae st 13	8	100.0	SE		800	NL
Coenocharopa yessabahensis	8	100.0	EC	RH	200	NL
Cristilabrum buryillum	8	0.0	NW	RH	200	NL
Cystopeltidae mv 1	8	87.5	EC		600	NL
Dentherona jemmysensis	8	25.0	SE	For	1000	NL
Glyptorhagada silveri	8	0.0	SCI	RH	900	NL
Granulomelon gilleni	8	0.0	CI	RH	300	NL
Gyliotrachela ningbingia	8	0.0	NW	RH	500	NL
Hadra bartschi	8	0.0	NE	RF	900	NL
Helicarionidae wt 18	8	100.0	NE		300	NL
Ngairea murphyi	8	25.0	SE	RF, For	600	NL
Paralaoma a	8	50.0			1000	NL
Retroterra 10	8	75.0	NW	For	400	NL
Rhagada millstream	8	100.0	NW	RH	100	NL
Rhytididae nn 2	8	62.5	EC		700	NL
Rhytididae nn 3	8	50.0	EC		1000	NL

Rotacharopa annabelli	8	25.0	NE	For	800	NL
Saladelos helmsiana	8	75.0	SE	WL	700	NL
Saladelos urarensis	8	50.0	EC	For	400	NL
Semotrachia caupona	8	0.0	CI	RH	100	NL
Semotrachia emilia	8	75.0	CI	RH	200	NL
Semotrachia hortulana	8	0.0	CI	RH	400	NL
Semotrachia hughana	8	0.0	CI	RH	200	NL
Steorra kirrama	8	75.0			800	NL
Steorra mourilyani	8	0.0			600	NL
Westraltrachia lievreana	8	0.0	NW	RH	500	NL
Adclarkia dawsonensis	**9**	**0.0**	**ECI**	**For, WL**	**500**	**CE**
Amplirhagada 37	9	0.0	NW	RH	500	NL
Arnemelassa creedi	9	44.4	NC	?	1200	NL
Basedowena cognata	9	77.8	CI	RH	400	NL
Basedowena papulankutjana	9	88.9	CI	RH	500	NL
Baudinella baudinensis	9	0.0	NW	RH	400	NL
Biomphalopa recava	9	66.7	NE	For	800	NL
Bothriembryon 1979	9	33.3	SW	RH	1000	NL
**Bothriembryon* location 14	9	66.7	SW	RH	200	NL
**Bothriembryon* location 42	9	100.0	SW	RH	200	NL
Camaenidae bl 18	9	11.1	ECI		900	NL
Camaenidae bl 42	9	22.2	ECI		900	NL
Camaenidae sn 9	9	22.2	EC		600	NL
Camaenidae wt 12	9	100.0	NE		600	NL
Charopidae br 32	9	22.2	EC		600	NL
Charopidae mq 5	9	33.3	NE		1000	NL
Charopidae mv 31	9	33.3	EC		700	NL
Charopidae sq 32	9	44.4	EC		400	NL
Charopidae wt 39	9	66.7	NE		800	NL
Charopidae wt 42	9	100.0	NE		500	NL
Charopidae wt 77	9	77.8	NE		900	NL
Cupedora bednalli	9	22.2	SC	WL	2900	NL
Cupedora evandaleana	9	22.2	SC	RH	2500	NL
Cupedora tomsetti	9	77.8	Kangaroo Is.	RH	900	NL
Danielleilona marycolliverae	9	88.9	NE, Mon	For	300	NL
Egilomen pexa	9	11.1	EC	For	700	NL
Galadistes ne 14	9	33.3	EC		800	NL
Galadistes ne 17	9	66.7	EC		600	NL
Glyptorhagada duvalae	9	0.0	SC	RH	200	NL
Helicarionidae sq 1	9	11.1	EC		800	NL
Helicarionidae sq 4	9	0.0	EC		900	NL
Helicarionidae wt 23	9	44.4	NE		500	NL
Helicarionidae wt 29	9	66.7	NE		700	NL
Helicarionidae wt 4	9	100.0	NE		200	NL
Letomola contortus	9	88.9	EC	RH	300	NL
Miselaoma weldii	9	55.6	SE, Tas	For	1000	NL
Ordtrachia australis	9	0.0	NE	RH	500	NL
Pandofella whitei	9	44.4	NE	For	1400	NL

Pupoides contrarius	9	22.2	NW	RH	800	NL
Roblinella agnewi	9	88.9	Tas	WL	200	NL
Roblinella intermedia	9	88.9	EC	For	800	NL
Semotrachia plana	9	0.0	CI	RH	600	NL
Sphaerospira mourilyani	9	22.2	NE	For	600	NL
Spurlingia gemma	9	0.0	NE	For	900	NL
Succineidae br 1	9	11.1	EC		1100	NL
**Bothriembryon* location 7	10	10.0	SWI	RH	1000	NL
Camaenidae mq 3	10	50.0	NE		1100	NL
Camaenidae mv 11	10	90.0	EC		700	NL
Camaenidae mv 4	10	40.0	EC		800	NL
Camaenidae wt 9	10	50.0	NE		700	NL
Charopidae br 39	10	30.0	EC		900	NL
Charopidae mv 7	10	20.0	EC		500	NL
Charopidae nn 21	10	30.0	CEI		700	NL
Charopidae nn 5	10	10.0	CEI		900	NL
Charopidae sn 12	10	20.0	EC		900	NL
Charopidae sq 15	10	30.0	EC		700	NL
Charopidae wt 34	10	60.0	NE		800	NL
Chloritisanax banneri	10	60.0	NE	For, WL	1000	NL
Cystopelta purpurea	10	80.0	SE	For	1300	NL
Eungarion mcdonaldi	10	90.0	NE, Mon	For	700	NL
Flammulops excelsior	10	40.0	SE	For, WL	1400	NL
Gastrocopta solemorum	10	50.0	NC	RH	800	NL
Glyptorhagada bordaensis	10	90.0	Kangaroo Is.	WL, RH	1300	NL
Gyrocochlea austera	10	10.0	EC	For	1200	NL
Helicarionidae br 2	10	80.0	EC		400	NL
Helicarionidae br 9	10	60.0	EC		1300	NL
Helicarionidae mq 8	10	50.0	NE		1100	NL
Helicarionidae sn 1	10	10.0	EC		800	NL
Helicarionidae wt 1	10	50.0	NE		800	NL
Helicarionidae wt 25	10	80.0	NE		300	NL
Kendrickia ignivenatus	10	0.0	NW	RH	700	NL
Kimboraga mccorryi	10	0.0	NW	RH	400	NL
Meridolum sn 15	10	30.0	EC	For	700	NL
Micromelon nepouieana	10	10.0	CI	RH	400	NL
Mussonena sq 4	10	10.0	EC		900	NL
Retroterra parva	10	90.0	NW	WL	600	NL
Rhytididae cy 1	10	20.0	NE		1000	NL
Rhytididae eu 2	10	30.0	NE		900	NL
Rhytididae sn 2	10	40.0	EC		700	NL
Semotrachia basedowi	10	0.0	SCI	RH	700	NL
Sphaerospira volgiola	10	0.0	NE	For, WL	1000	NL
Spurlingia praehadra	10	0.0	NE	For	900	NL
Steorra mitifica	10	0.0			800	NL
Strepsitaurus cardabius	10	0.0	WC	GrL	800	NL

Succinea sq 1	10	0.0	EC?		1000	NL
Torresitrachia regula	10	100.0	NW	RH	700	NL
Westraltrachia froggatti	10	80.0	NW	RH	200	NL
Westraltrachia recta	10	0.0	NW	RH	500	NL

Removal of extinct and poorly recorded species leaves 38702 records in ANHAT for 727 species (and subspecies). The mean number of records per species for species with greater than 10 records was 53.2 with a mean of 30.6 for the percent of records in the NRS. Of these, 178 species had 45% or greater of individual site records located within The NRS (**Table 58**). This table is dominated by species from eastern Australia, with very few species from the western half of the continent being included, especially given their diversity in that half of Australia. The species are also far more likely to be from forested environments than would be expected given the broad habitat representation in this group. This is indicative of the relatively high reservation rate of this environment in eastern Australia. One species, *Kimboraga micromphala*, has all of its records held with the reserve system. Interestingly, this species comes from north-western Australia.

Table 58 Land snail species with >45% of site records within PAs

Species	No. Records	Records in NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Bothriembryon naturalistarum	40	18	45.00	SW	SL	1300	NL
Helicarionidae cy 10	11	5	45.45	NE		1000	NL
Saladelos nn 3	11	5	45.45	EC	For	900	NL
Rhytididae mv 7	79	36	45.57	EC		4700	NL
Strangesta confusa	61	28	45.90	NE	For	5900	NL
Sinumelon aversum	152	70	46.05	SC	RH	8900	NL
Bothriembryon jacksoni cf.	13	6	46.15	SW	RH	800	NL
Rhophodon consobrinus	13	6	46.15	EC	For	1000	NL
Strangesta alpica	13	6	46.15	EC, Mon	For	1300	NL
Pedinogyra allani	26	12	46.15	NE	For	2300	NL
Pallidelix greenhilli	54	25	46.30	NE	WL	3500	NL
Semotrachia elleryi	15	7	46.67	CI	RH	600	NL
Sphaerospira sardalabiata	15	7	46.67	NE	For	3200	NL
Austrochloritis victoriae	100	47	47.00	EC	For	12000	NL
Cystopelta bicolor	70	33	47.14	Tas	For	6400	NL
Ngairea dorrigoensis	36	17	47.22	EC	For	2700	NL
Caryodes dufresnii	296	140	47.30	Tas	For	17700	NL
Nitor br 7	19	9	47.37	EC	For	1500	NL
Setobaudinia doongana	19	9	47.37	NW	WL,	800	NL

					RH		
Strangesta bullacea	38	18	47.37	NE-EC	For	3500	NL
Rhytididae br 1	61	29	47.54	EC		4600	NL
Amplirhagada burnerensis burnerensis	21	10	47.62	NW	RH	600	NL
Gyrocochlea planorbis	113	54	47.79	EC	For	5800	NL
Amplirhagada castra	23	11	47.83	NW	RF	500	NL
Posorites conscendens	39	19	48.72	EC	For	3300	NL
Fastosarion brazieri	84	41	48.81	NE	For	4500	NL
Allocharopa legrandi	45	22	48.89	Tas	For	4200	NL
Thersites novae*hollandiae*	147	73	49.66	EC	For	9100	NL
Discocharopa vigens	12	6	50.00	Tas	For	1300	NL
Mouldingia occidentalis	12	6	50.00	NW	RH	200	NL
Mussonula verax	12	6	50.00	EC	For	1200	NL
Sphaerospira macleayi	16	8	50.00	NE	For, WL	1200	NL
Westraltrachia cunicula	16	8	50.00	NW	RH	500	NL
Westraltrachia limbana	24	12	50.00	NW	RH	800	NL
Meridolum mastersi	28	14	50.00	SE	For, WL	2500	NL
Paralaoma st 2	30	15	50.00	SE		2500	NL
Helicarionidae mv 1	32	16	50.00	EC		2100	NL
Rhytididae mv 3	215	108	50.23	EC		13200	NL
Hedleyoconcha delta	107	55	51.40	EC	RF, For	8500	NL
Charopidae mv 22	35	18	51.43	EC		1900	NL
Gyrocochlea prava	35	18	51.43	EC	For	2900	NL
Austrochloritis nambucca	97	50	51.55	EC	For	5000	NL
Hedleyella falconeri	220	114	51.82	EC	For	13000	NL
Saladelos bensa	25	13	52.00	NE	For	2100	NL
Bothriembryon sayi	75	39	52.00	SW	RH	1600	NL
Xanthomelon ruberpumilio	48	25	52.08	NW	RH	3100	NL
Rhophodon bairnsdalensis	21	11	52.38	SE	For, SL	2300	NL
Bothriembryon revectus	17	9	52.94	SW	SL	1300	NL
Pupoides ischnus	17	9	52.94	NW	RH	1700	NL
Helicarion nigra	32	17	53.13	SE	For, WL	7100	NL
Setomedea seticostata	62	33	53.23	EC	For	4000	NL
Pedinogyra sq 1	15	8	53.33	EC	For	900	NL
Bothriembryon notatus	13	7	53.85	SW	RH	1300	NL

Malandena suturalis	63	34	53.97	NE	For	3300	NL
Pygmipanda atomata	70	38	54.29	EC	For	4800	NL
Coneuplecta pampini	11	6	54.55	CI	RH	1100	NL
Quistrachia herberti	11	6	54.55	NW		500	NL
Saladelos hobsoni	22	12	54.55	NE	For	2000	NL
Westraltrachia oscarensis	22	12	54.55	NW	RH	600	NL
Montidelos orcadis	20	11	55.00	EC	For	1100	NL
Victaphanta compacta	87	48	55.17	SE	For	2500	NL
Helicarionidae ne 2	18	10	55.56	EC		800	NL
Ngairea canaliculata	18	10	55.56	NE	For	1200	NL
Sphaerospira rawnesleyi	18	10	55.56	NE		1700	NL
Torresitrachia monticola	45	25	55.56	NW	RH	1700	NL
Melocystis circumcincta	70	39	55.71	SE	For	4000	NL
Pernagera kingstonensis	176	99	56.25	Tas	WL	10700	NL
Pedinogyra rotabilis	79	45	56.96	EC	For	5000	NL
Helicarion mastersi	207	118	57.00	EC-SE	For	9700	NL
Charopidae br 12	14	8	57.14	EC		1100	NL
Gyrocochlea sp.	14	8	57.14	EC	For	1500	NL
Strepsitaurus williami	14	8	57.14	WC	RH	700	NL
Bothriembryon tasmanicus	42	24	57.14	Tas	For	4500	NL
Sinumelon hawkerana	40	23	57.50	SC-SCI	RH	1700	NL
Baudinella regia	26	15	57.69	NW	RH	1200	NL
Jacksonena rudis	26	15	57.69	NE	For	1800	NL
Camaenidae nn 3	12	7	58.33	ECI		1100	NL
Charopidae mq 11	12	7	58.33	NE		1000	NL
Parmavitrina planilabris	65	38	58.46	EC	For	3700	NL
Amplirhagada pusilla	17	10	58.82	NW	SL	900	NL
Austrochloritis sn 6	39	23	58.97	EC	For	2200	NL
Cooperconcha bunyerooana	49	29	59.18	SCI	RH	1700	NL
Austrochloritis porteri	45	27	60.00	EC	For	3200	NL
Charopidae mv 25	18	11	61.11	EC		500	NL
Strangesta sheridani	108	66	61.11	NE	For	6800	NL
Austrochloritis ascensa	31	19	61.29	EC	For	1400	NL
Dentherona dispar	44	27	61.36	Tas	WL	2900	NL
Helicarionidae wt 3	57	35	61.40	NE		4300	NL
Camaenidae wt 7	13	8	61.54	NE		700	NL

Helicarion dispositus	26	16	61.54	EC, Mon	For	1400	NL
Charopidae sp *d*	21	13	61.90	NC		1300	NL
Victaphanta milligani	64	40	62.50	Tas	For	5400	NL
Charopidae mv 35	35	22	62.86	EC		2300	NL
Rhytididae mv 2	27	17	62.96	EC		1500	NL
Camaenidae sn 20	19	12	63.16	EC		1200	NL
Helicarionidae wt 15	19	12	63.16	NE		1400	NL
Rhytididae bl 3	19	12	63.16	ECI		1300	NL
Ngairea corticicola	38	24	63.16	EC	For	2300	NL
Camaenidae wt 5	11	7	63.64	NE		700	NL
Thersites richmondiana	58	37	63.79	NE	For, WL	3000	NL
Austrochloritis br 1	14	9	64.29	EC		1100	NL
Camaenidae wt 6	14	9	64.29	NE		800	NL
Helicarionidae mq 3	14	9	64.29	NE		1400	NL
Sphaerospira mazee	28	18	64.29	NE		2000	NL
Westraltrachia rotunda	31	20	64.52	NW	RH	900	NL
Fastosarion superba	29	19	65.52	NE	For	1900	NL
Charopidae sn 26	35	23	65.71	EC		1100	NL
Tarocystis fulva	83	55	66.27	NE	For	4600	NL
Galadistes expeditionis	12	8	66.67	NE	WL, For	900	NL
Torresitrachia deflecta	12	8	66.67	NW	RH	600	NL
Austrochloritis sn 7	15	10	66.67	EC	For	500	NL
Bothriembryon fuscus	15	10	66.67	SW	For	800	NL
Austrorhytida glaciamans	18	12	66.67	SE	For	1500	NL
Rhagada pilbarana	16	11	68.75	NW	RH	600	NL
Gnarosophia bellendenkerensis	130	91	70.00	NE	For	7200	NL
Sinumelon gillensis	17	12	70.59	CI	RH	700	NL
Austrochloritis agamemnon	34	24	70.59	NE	For	2200	NL
Mussonena spinei	14	10	71.43	EC	For	1100	NL
Pillomena nivea	14	10	71.43	SE, Mon	WL	1600	NL
Austrochloritis sn 8	28	20	71.43	EC	For	900	NL
Meridolum depressa	25	18	72.00	SC	For	1200	NL
Bothriembryon rhodostomus	11	8	72.73	Recherche Isl.	SL	1400	NL
Egilomen globosa	11	8	72.73	EC	For	1200	NL
Helicarionidae wt 12	11	8	72.73	NE		900	NL
Strangesta sq 6	15	11	73.33	EC	For	900	NL
Cystopelta st 1	19	14	73.68	SE	For	1300	NL

Westraltrachia froggatti froggatti	23	17	73.91	NW	RH	400	NL
Bothriembryon brazieri	46	34	73.91	SW	WL	2400	NL
Helicarionidae br 1	27	20	74.07	EC		1200	NL
Mulathena fordei	89	66	74.16	SE, Tas	For	6600	NL
Charopidae wt 5	12	9	75.00	NE		1200	NL
Semotrachia bagoti	12	9	75.00	CI	RH	600	NL
Semotrachia jessieana	12	9	75.00	CI	RH	200	NL
Setomedea janae	12	9	75.00	NE	For	600	NL
Setobaudinia interrex	16	12	75.00	NW	RH	600	NL
Westraltrachia derbyi	53	40	75.47	NW	RH	900	NL
Setomedea monteithi	41	31	75.61	NE	For	1800	NL
Amplirhagada drysdaleana	13	10	76.92	NW	SL	700	NL
Cystopeltidae br 1	13	10	76.92	EC		900	NL
Helicarionidae wt 7	22	17	77.27	NE		1800	NL
Helicarionidae wt 8	22	17	77.27	NE		1300	NL
Torresitrachia umbonis	36	28	77.78	NW	RH	2100	NL
Charopidae br 1	14	11	78.57	EC		1500	NL
Hadra semicastanea	14	11	78.57	NE Is.	RF, For	1100	NL
Rhytididae ne 2	14	11	78.57	EC		500	NL
Roblinella curacoae	19	15	78.95	Tas	WL	1300	NL
Rhytididae wt 1	48	38	79.17	NE		2600	NL
Helicarionidae wt 11	15	12	80.00	NE		900	NL
Jacksonena delicata	20	16	80.00	NE	For	1300	NL
Helicarionidae wt 10	58	47	81.03	NE		2100	NL
Helicarionidae ne 1	16	13	81.25	EC		500	NL
Pseudcupedora trezonana	16	13	81.25	SCI	RH	400	NL
Helicarionidae wt 13	27	22	81.48	NE		1400	NL
Marilyniropa jenolanensis	11	9	81.82	EC	RH	100	NL
Retroterra solituda	11	9	81.82	NW	For	600	NL
Gyrocochlea vinitincta	17	14	82.35	EC	For	1600	NL
Austrochloritis st 2	23	19	82.61	EC	For	1300	NL
Charopidae br 2	12	10	83.33	EC		1300	NL
Pernagera a	12	10	83.33			500	NL
Biomphalopa concinna	18	15	83.33	NE	For	700	NL
Thularion semoni	42	35	83.33	NE	RF, For	1500	NL
Charopidae br 3	14	12	85.71	EC		1000	NL
Oreokera cumulus	29	25	86.21	NE	For	1400	NL
Amplirhagada wilsoni	22	19	86.36	NW	RH	1300	NL

Bothriembryon glauerti	48	42	87.50	SW	WL	600	NL
Retroterra costa	17	15	88.24	NW	For	900	NL
Amplirhagada carinata	18	16	88.89	NW	WL	1200	NL
Pleuroxia hinsbyi	11	10	90.91	SEI	RH	700	NL
Noctepuna cerea	14	13	92.86	NE	For	1000	NL
Rhagada harti	14	13	92.86	NW	RH	200	NL
Stenacapha c	56	52	92.86	Tas	For	1100	NL
Malandena wt 9	16	15	93.75	NE	For	400	NL
Meridolum marshalli	37	35	94.59	SC	For	500	NL
Kimboraga exanimus	11	11	100.00	NW	For	400	NL
Helicarionidae mv 4	12	12	100.00	EC		800	NL
Minimelon colmani	21	21	100.00	CI	RH	800	NL
Quistrachia barrowensis	23	23	100.00	Barrow Is.		700	NL
Kimboraga micromphala	33	33	100.00	NW	RH	200	NL

One hundred and fifty-nine species had less than 10% of ANHAT records located within the NRS, including two threatened species – one endangered and one critically endandered (**Table 59**). The species most poorly represented in reserves are generally found in western parts of Australia, although as representation becomes slightly higher, other parts of Australia are also included. Eighty-six species have no records within the reserve system. Species requiring rocky environments for survival predominate in the species with <10% of records in reserves, especially amongst the most poorly represented species.

Table 59 Land snail species with <10% of ANHAT records located within PAs.

Species	No. Records	Inside NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Amplirhagada varia depressa	11	0	0.00	NW	RH	600	NL
Camaenidae bl 3	11	0	0.00	ECI		700	NL
Camaenidae bl 54	11	0	0.00	ECI		1100	NL
Cassidula coelata	11	0	0.00	N	Littoral	900	NL
Charopidae sq 23	11	0	0.00	EC		600	NL
Charopidae sq 33	11	0	0.00	EC		700	NL
Dirutrachia mersa	11	0	0.00	SCI	RH	1000	NL
Rhagada reinga	11	0	0.00	NW	RH	900	NL
Semotrachia euzyga	**11**	**0**	**0.00**	**CI**	**RH**	**800**	**EN**
Strangesta assimilans	11	0	0.00	EC	For	800	NL
Camaenidae bl 2	12	0	0.00	ECI		1200	NL

Camaenidae eu 2	12	0	0.00	NE		500	NL
Camaenidae nn 6	12	0	0.00	ECI		700	NL
Cassidula decussata	12	0	0.00	N	Littoral	800	NL
Helicarionidae sq 2	12	0	0.00	EC		700	NL
Pleuroxia radiata	12	0	0.00	SC	RH	600	NL
Quistrachia warroorana	12	0	0.00	NW		600	NL
Rhagada construa	12	0	0.00	NW	RH	500	NL
Rhagada dringi	12	0	0.00	Torres St.	RH	800	NL
Setobaudinia anatispretia	12	0	0.00	NW	RH	500	NL
Tatemelon everardensis	12	0	0.00	SCI	RH	300	NL
Turgenitubulus depressus	12	0	0.00	NW	RH	100	NL
Aslintesta camelus	13	0	0.00	SCI	RH	1100	NL
Pedinogyra sq 3	13	0	0.00	EC	For	300	NL
Pleuroxia cyrtopleura	13	0	0.00	SCI	RH	2100	NL
Turgenitubulus pagodula	13	0	0.00	NW	RH	200	NL
Amplirhagada alta crystalla	14	0	0.00	NW	RH	100	NL
Charopidae cy 2	14	0	0.00	NE		300	NL
Helicarionidae eu 3	14	0	0.00	NE		1200	NL
Montanomelon reynoldsi	14	0	0.00	CI	RH	900	NL
Sinumelon jimberlanensis	14	0	0.00	WI	RH	700	NL
Sinumelon pumilio	14	0	0.00	SCI	RH	500	NL
Turgenitubulus foramenus	14	0	0.00	NW	RH	100	NL
Turgenitubulus tanmurrana	14	0	0.00	NW	RH	200	NL
Cristilabrum isolatum	15	0	0.00	NW	RH	300	NL
Helicarionidae eu 1	15	0	0.00	NE		800	NL
Sinumelon musgravesi	15	0	0.00	CI	RH	700	NL
Westraltrachia pillarana	15	0	0.00	NW	RH	600	NL
Bothriembryon whitleyi	16	0	0.00	WC	RH	1400	NL
Mouldingia orientalis	16	0	0.00	NW	RH	400	NL
Semotrachia bensteadana	16	0	0.00	CI	RH	500	NL

Turgenitubulus aslini	16	0	0.00	NW	RH	300	NL
Westraltrachia complanata	17	0	0.00	NW	RH	200	NL
Basedowena cottoni	18	0	0.00	SCI	RH	1500	NL
Basedowena gigantea	18	0	0.00	SCI	RH	600	NL
Cristilabrum simplex	19	0	0.00	NW	RH	200	NL
Ningbingia australis	19	0	0.00	NW	RH	400	NL
Pleuroxia bethana	19	0	0.00	WC	RH	400	NL
Rhagada globosa	19	0	0.00	NW	RH	1100	NL
Rhagada basedowana	20	0	0.00	NW	RH	800	NL
Sinumelon amatensis	20	0	0.00	CI	RH	1600	NL
Camaenidae cy 8	21	0	0.00	NE		600	NL
Falspleuroxia overlandensis	21	0	0.00	?	?	700	NL
Helicarionidae cy 9	21	0	0.00	NE		1900	NL
Tatemelon musgum	21	0	0.00	SCI	RH	700	NL
Westraltrachia inopinata	21	0	0.00	NW	RH	100	NL
Cristilabrum grossum	22	0	0.00	NW	RH	400	NL
**Bothriembryon* location 140	23	0	0.00	WC	RH	1400	NL
Camaenidae eu 17	23	0	0.00	NE		700	NL
Cristilabrum monodon	23	0	0.00	NW	RH	200	NL
Cristilabrum solitudum	23	0	0.00	NW	RH	100	NL
Cupedora lincolnensis	23	0	0.00	SC	WL, RH	1800	NL
Cooperconcha mawsoni	25	0	0.00	SCi	RH	2000	NL
Cristilabrum bubulum	25	0	0.00	NW	RH	200	NL
Cristilabrum spectaculum	25	0	0.00	NW	RH	600	NL
Ningbingia dentiens	25	0	0.00	NW	RH	400	NL
Turgenitubulus costus	25	0	0.00	NW	RH	300	NL
Discocharopa ne 30	26	0	0.00	EC	?	1100	NL
Westraltrachia ampla	26	0	0.00	NW	RH	1000	NL
Rhagada bulgana	27	0	0.00	NW	RH	1300	NL
Pleuroxia everardensis	28	0	0.00	SCI	RH	700	NL
Westraltrachia froggatti complanata	29	0	0.00	NW	RH	400	NL
Rhytididae bl 1	30	0	0.00	ECI		2300	NL

Turgenitubulus christenseni	30	0	0.00	NW	RH	300	NL
Sinumelon fodinalis	31	0	0.00	SEI	RH	3700	NL
Plectorhagada plectilis	33	0	0.00	NW	RH	2600	NL
Sinumelon remissum	35	0	0.00	SCI	RH	4000	NL
Turgenitubulus opiranus	35	0	0.00	NW	RH	100	NL
Ningbingia res	36	0	0.00	NW	RH	300	NL
Cristilabrum primum	37	0	0.00	NW	RH	300	NL
Ningbingia bulla	42	0	0.00	NW	RH	400	NL
Cupedora extensum	46	0	0.00	SCI	RH	2800	NL
Torresitrachia torresiana	48	0	0.00	Torres St.	RH	5900	NL
Ningbingia octava	51	0	0.00	NW	RH	500	NL
Westraltrachia woodwardi	61	0	0.00	NW	RH	1200	NL
Amplirhagada napierana	110	0	0.00	NW	WL	1100	NL
Amplirhagada percita	98	1	1.02	NW	RH	900	NL
Westraltrachia commoda	71	1	1.41	NW	RH	600	NL
Westraltrachia turbinata	61	1	1.64	NW	RH	400	NL
Plectorhagada carcharias	44	1	2.27	WC	RH	2300	NL
Torresitrachia bathurstensis	44	1	2.27	NW	RH	3200	NL
Ningbingia laurina	37	1	2.70	NW	RH	300	NL
Exiligada negriensis	35	1	2.86	NW	RH	1800	NL
Rhagada capensis	35	1	2.86	NW	RH	1100	NL
Amplirhagada burnerensis umbilicata	34	1	2.94	NW	RH	600	NL
Granulomelon acerbum	34	1	2.94	CI	RH	1400	NL
Sinumelon tarcoolanum	33	1	3.03	WI-SC	RH	3300	NL
Gyliotrachela australis	62	2	3.23	NE	RH	3000	NL
Hadra barneyi	61	2	3.28	NE	For, WL	5800	NL
Bothriembryon balteolus	55	2	3.64	SW	RH	3200	NL
Sinumelon pedasum	109	4	3.67	SCI	RH	6400	NL
Quistrachia leptogramma	25	1	4.00	NW	RH	1500	NL
Cupedora sublorioliana	48	2	4.17	SCI	RH	4100	NL

Ellobium aurisjudae	23	1	4.35	NW-NE	Man	1900	NL
Camaenidae sq 14	22	1	4.55	EC		1400	NL
Setobaudinia 5	22	1	4.55	NW	RH	1300	NL
Meridolum ne 16	132	6	4.55	EC	For	9400	NL
Damochlora rectilabrum	21	1	4.76	NW	RH	800	NL
Thersites mitchellae	**125**	**6**	**4.80**	**EC**	**For**	**2100**	**CE**
Ventopelita mansueta	39	2	5.13	EC	For, WL	3200	NL
Sinumelon perinflata	77	4	5.19	CI	RH	6300	NL
Galadistes intervenens	19	1	5.26	ECI	WL	1700	NL
Helicarionidae eu 2	19	1	5.26	NE		1300	NL
Ordtrachia intermedia	19	1	5.26	NE	RH	1000	NL
Sphaerospira incei	19	1	5.26	NE	For	5200	NL
Galadistes liverpoolensis	113	6	5.31	ECI	WL, RH	6600	NL
Cupedora cassandra	37	2	5.41	SC	RH	4800	NL
Glyptorhagada kooringensis	18	1	5.56	SCI	RH	1500	NL
Cupedora broughami	17	1	5.88	SC	WL, RH	2500	NL
Ordtrachia grandis	17	1	5.88	NE	RH	900	NL
Rhytididae sq 2	17	1	5.88	EC		900	NL
Tatemelon herberti	17	1	5.88	SCI	RH	1300	NL
Camaenidae eu 14	16	1	6.25	NE		1000	NL
Carinotrachia carsoniana	16	1	6.25	NW	RH	700	NL
Neveritis aridorum	78	5	6.41	EC	For	6600	NL
Helicarionidae cy 8	87	6	6.90	NE		5100	NL
Bothriembryon bradshawi	14	1	7.14	SW	RH	1500	NL
Rhagada sutra	14	1	7.14	NW	RH	500	NL
Rhytididae ne 5	14	1	7.14	EC		900	NL
Camaenidae bl 47	28	2	7.14	ECI		3600	NL
Galadistes ne 15	97	7	7.22	EC		7600	NL
Camaenidae wt 13	40	3	7.50	NE		2500	NL
Austrochloritis sn 10	13	1	7.69	EC	For	500	NL
Austrochloritis sn 3	13	1	7.69	EC	For	800	NL
**Strepsitaurus* location 141	13	1	7.69	WC	RH	500	NL

Westraltrachia tropida	13	1	7.69	NW	RH	700	NL
Camaenidae bl 1	26	2	7.69	ECI		2700	NL
Quistrachia legendrei	51	4	7.84	NW		900	NL
Camaenidae bl 55	38	3	7.89	ECI		4200	NL
Camaenidae ne 15	12	1	8.33	EC		1200	NL
Parglogenia pelodes	46	4	8.70	NC	WL, SL	3400	NL
Xanthomelon jannellei	69	6	8.70	NE	WL	6600	NL
Meridolum corneovirens	620	55	8.87	SC	For, WL	3700	NL
Sphaerospira incei curtisiana	67	6	8.96	NE-EC	For	5600	NL
Camaenidae bl 21	11	1	9.09	ECI		900	NL
Elsothera hewittorum	11	1	9.09	ECI	For, WL	500	NL
Quistrachia turneri	11	1	9.09	NW		400	NL
**Bothriembryon* location 139	22	2	9.09	SW	RH?	2200	NL
Ramogenia lanuginosa	22	2	9.09	NE	WL	2300	NL
Sphaerospira challisi	366	34	9.29	EC	For, WL	25800	NL
Gyliotrachela australis australis	43	4	9.30	NE	RH	1700	NL
Galadistes alleni	32	3	9.38	ECI	WL	2800	NL
Helicarion rubicundus	32	3	9.38	Tas	For	300	NL
Pedinogyra minor	21	2	9.52	NE	For	2100	NL
Prymnbriareus nimberlinus	21	2	9.52	NE	RH	800	NL
Quistrachia lefroyi	42	4	9.52	NW		1400	NL
Dendronitor inscensa	31	3	9.68	NE	For	2300	NL
Sinumelon kalgum	61	6	9.84	SWI	RH	3900	NL
Helicarionidae sq 11	20	2	10.00	EC		1800	NL

No land snail species had records in more than 100 separate reserves. This is indicative of the very limited number of records available for snails and also the relatively smaller geographic areas species of this group tend to inhabit. Hence, it is unlikely that most species could ever inhabit more than a few dozen reserves at best.

A total of 402 species had records in five or fewer PAs, including one critically endangered species and two endangered species. The majority of species in this list had fewer than 100 individual record sites, and no species had more than 170 records sites. Four hundred and twenty-three species of land snail had records in five or fewer PAs greater than 1000 hectares.

Table 60 Land snail species recorded from five or fewer PAs and from five or fewer PAs >1000 ha.

Species	No. Records	No. reserves	No. Reserves >1000ha	EPBC status
Elsothera hewittorum	11	1	0	NL
Thersites mitchellae	**125**	**1**	**0**	**CE**
Rhytididae ne 5	14	1	0	NL
Hadra semicastanea	14	1	0	NL
Camaenidae bl 21	11	1	1	NL
Marilyniropa jenolanensis	11	1	1	NL
Retroterra solituda	11	1	1	NL
Quistrachia herberti	11	1	1	NL
Caperantrum polygyrum	11	1	1	NL
Pleuroxia hinsbyi	11	1	1	NL
Quistrachia turneri	11	1	1	NL
Torresitrachia aff. *regula*	11	1	1	NL
Kimboraga exanimus	11	1	1	NL
Semotrachia jessieana	12	1	1	NL
Semotrachia bagoti	12	1	1	NL
Mouldingia occidentalis	12	1	1	NL
Camaenidae ne 15	12	1	1	NL
Galadistes expeditionis	12	1	1	NL
Camaenidae sq 16	13	1	1	NL
Westraltrachia tropida	13	1	1	NL
**Strepsitaurus* location 141	13	1	1	NL
Austrochloritis sn 10	13	1	1	NL
Austrochloritis sn 3	13	1	1	NL
Amplirhagada drysdaleana	13	1	1	NL
Rhophodon minutissimus	14	1	1	NL
Camaenidae ne 18	14	1	1	NL
Rhagada sutra	14	1	1	NL
Rhagada harti	14	1	1	NL
Charopidae mv 6	14	1	1	NL
Strepsitaurus williami	14	1	1	NL
Bothriembryon bradshawi	14	1	1	NL
4 novae	14	1	1	NL
Semotrachia elleryi	15	1	1	NL
Meridolum sn 16	15	1	1	NL
Camaenidae bl 13	16	1	1	NL
Carinotrachia carsoniana	16	1	1	NL
Malandena wt 9	16	1	1	NL
Pseudcupedora trezonana	16	1	1	NL
Rhagada pilbarana	16	1	1	NL
Bothriembryon meanarra	16	1	1	NL
Camaenidae eu 14	16	1	1	NL
Sphaerospira macleayi	16	1	1	NL
Steorra rawnsleyi	16	1	1	NL

Mussonena campbelli	17	1	1	NL
Rhytididae sq 2	17	1	1	NL
Cupedora broughami	17	1	1	NL
Sinumelon gillensis	17	1	1	NL
Ordtrachia grandis	17	1	1	NL
Tatemelon herberti	17	1	1	NL
Amplirhagada pusilla	17	1	1	NL
Charopidae sq 4	18	1	1	NL
Amplirhagada carinata	18	1	1	NL
Glyptorhagada kooringensis	18	1	1	NL
Sphaerospira rawnesleyi	18	1	1	NL
Camaenidae cy 3	19	1	1	NL
Camaenidae cy 9	19	1	1	NL
Camaenidae 2	19	1	1	NL
Meridolum exocarpi	19	1	1	NL
Setobaudinia doongana	19	1	1	NL
Camaenidae ne 19	19	1	1	NL
Promonturconchum superbum	19	1	1	NL
Ordtrachia intermedia	19	1	1	NL
Rhagada richardsonii	19	1	1	NL
Galadistes intervenens	19	1	1	NL
Helicarionidae eu 2	19	1	1	NL
Sphaerospira incei	19	1	1	NL
Minimelon colmani	21	1	1	NL
Prymnbriareus nimberlinus	21	1	1	NL
Damochlora rectilabrum	21	1	1	NL
Setobaudinia 5	22	1	1	NL
Setobaudinia hirsuta	22	1	1	NL
Camaenidae sq 14	22	1	1	NL
Westraltrachia oscarensis	22	1	1	NL
Quistrachia barrowensis	23	1	1	NL
Prototrachia sedula	23	1	1	NL
Ellobium aurisjudae	23	1	1	NL
Westraltrachia froggatti froggatti	23	1	1	NL
Amplirhagada castra	23	1	1	NL
Basedowena vulgata	23	1	1	NL
Baccalena squamulosa	23	1	1	NL
Quistrachia leptogramma	25	1	1	NL
Contramelon howardi	26	1	1	NL
Bothriembryon leeuwinensis	26	1	1	NL
Amplirhagada varia varia	26	1	1	NL
Lacustrelix minor	26	1	1	NL
Mesodontrachia fitzroyana	**27**	**1**	**1**	**EN**
Helicarionidae sq 5	28	1	1	NL
Strepsitaurus rugus	32	1	1	NL
Helicarion rubicundus	32	1	1	NL
Sinumelon tarcoolanum	33	1	1	NL
Kimboraga micromphala	33	1	1	NL
Rhagada radleyi	34	1	1	NL

Amplirhagada burnerensis			1	
umbilicata	34	1		NL
Granulomelon acerbum	34	1	1	NL
Rhagada capensis	35	1	1	NL
Exiligada negriensis	35	1	1	NL
Sinumelon godfreyi	36	1	1	NL
Rhagada torulus	36	1	1	NL
Ningbingia laurina	37	1	1	NL
Ventopelita mansueta	39	1	1	NL
Bothriembryon naturalistarum	40	1	1	NL
Sinumelon hawkerana	40	1	1	NL
Camaenidae wt 13	40	1	1	NL
Semotrachia esau	44	1	1	NL
Plectorhagada carcharias	44	1	1	NL
Torresitrachia bathurstensis	44	1	1	NL
Cupedora sublorioliana	48	1	1	NL
Bothriembryon glauerti	48	1	1	NL
Cooperconcha bunyerooana	49	1	1	NL
Sinumelon wilpenensis	54	1	1	NL
Westraltrachia turbinata	61	1	1	NL
Gyliotrachela australis	62	1	1	NL
Westraltrachia commoda	71	1	1	NL
Lacustrelix eyrei	86	1	1	NL
Amplirhagada percita	98	1	1	NL
Meridolum corneovirens	620	15	2	NL
Sphaerospira incei incei	31	2	0	NL
Parmavitrina megastoma	11	2	1	NL
Ramogenia mucida	12	2	1	NL
Cralopa st 25	12	2	1	NL
Pravonitor kreffti	13	2	1	NL
Austrochloritis nn 2	14	2	1	NL
Charopidae sq 47	14	2	1	NL
Westraltrachia cunicula	16	2	1	NL
Helicarionidae mv 2	16	2	1	NL
Charopidae nn 6	18	2	1	NL
Helicarionidae ne 4	18	2	1	NL
Peloparion helenae	19	2	1	NL
Rhophodon kempseyensis	24	2	1	NL
Camaenidae bl 47	28	2	1	NL
Cupedora cassandra	37	2	1	NL
Meridolum marshalli	37	2	1	NL
Bothriembryon balteolus	55	2	1	NL
Victaphanta compacta	87	2	1	NL
Amplirhagada burnerensis	100	2	2	NL
Sinumelon pedasum	109	2	2	NL
Parmavitrina sn 5	11	2	2	NL
Coenocharopa macromphala	11	2	2	NL
Helicarionidae cy 10	11	2	2	NL
Helicarionidae bl 10	11	2	2	NL
Austrochloritis ne 7	11	2	2	NL

Austrochloritis bellengerensis	11	2	2	NL
Austrochloritis disjuncta	11	2	2	NL
Camaenidae eu 3	11	2	2	NL
Galadistes liverpoolensis	113	2	2	NL
Ophicardelus ornata	12	2	2	NL
Charopidae mq 11	12	2	2	NL
Setomedea janae	12	2	2	NL
Succinea strigillata	12	2	2	NL
Torresitrachia deflecta	12	2	2	NL
Succinea scalarina	13	2	2	NL
Camaenidae wt 7	13	2	2	NL
Allocharopa tarravillensis	13	2	2	NL
Charopidae br 35	14	2	2	NL
Charopidae sq 25	14	2	2	NL
Mussonena spinei	14	2	2	NL
Rhytididae ne 2	14	2	2	NL
Strangesta sq 6	15	2	2	NL
Bothriembryon fuscus	15	2	2	NL
80 novae	15	2	2	NL
Pedinogyra sq 4	16	2	2	NL
Helicarionidae ne 1	16	2	2	NL
Setobaudinia interrex	16	2	2	NL
Damochlora spina	17	2	2	NL
Retroterra costa	17	2	2	NL
Bothriembryon hamersley gorges	17	2	2	NL
Camaenidae cy 4	17	2	2	NL
Ngairea canaliculata	18	2	2	NL
Cassidula angulifera	18	2	2	NL
Pillomena meraca	18	2	2	NL
Camaenidae sq 9	18	2	2	NL
Pedinogyra sq 2	19	2	2	NL
Rhytididae bl 3	19	2	2	NL
Rhytididae br 2	19	2	2	NL
Helicarionidae sq 11	20	2	2	NL
Pedinogyra minor	21	2	2	NL
Amplirhagada burnerensis burnerensis	21	2	2	NL
**Bothriembryon* location 139	22	2	2	NL
Amplirhagada wilsoni	22	2	2	NL
Ramogenia lanuginosa	22	2	2	NL
Amplirhagada kalumburuana	25	2	2	NL
Camaenidae bl 1	26	2	2	NL
Baudinella regia	26	2	2	NL
Westraltrachia alterna	27	2	2	NL
Rhagada angulata	27	2	2	NL
Paralaoma st 1	28	2	2	NL
Periclocystis ardeni	29	2	2	NL
Cupedora luteofusca	29	2	2	NL
Fastosarion superba	29	2	2	NL

Sinumelon bitaeniata	29	2	2	NL
Plectorhagada scolythra	29	2	2	NL
Helicarionidae bl 11	30	2	2	NL
Galadistes alleni	32	2	2	NL
Trachiopsis strangulata	34	2	2	NL
Amplirhagada elevata	36	2	2	NL
Melostrachia glomerans	39	2	2	NL
Quistrachia lefroyi	42	2	2	NL
Gyliotrachela australis australis	43	2	2	NL
Parglogenia pelodes	46	2	2	NL
Rhagada gatta	48	2	2	NL
Sinumelon serlense	49	2	2	NL
Quistrachia legendrei	51	2	2	NL
Stenacapha c	56	2	2	NL
Sinumelon petum	59	2	2	NL
Hadra barneyi	61	2	2	NL
Cupedora meridionalis	67	2	2	NL
Bothriembryon sayi	75	2	2	NL
Charopidae br 33	14	3	1	NL
Sphaerospira oconnellensis	37	3	1	NL
Cralopa carlessi	12	3	2	NL
Camaenidae mv 8	12	3	2	NL
Geminoropa hookeriana	13	3	2	NL
Tornatellinops mastersi	14	3	2	NL
Torresitrachia stipata	15	3	2	NL
Austrochloritis sn 7	15	3	2	NL
Cupedora ki	15	3	2	NL
Sphaerospira rockhamptonensis	18	3	2	NL
Charopidae mv 30	18	3	2	NL
Charopidae mv 25	18	3	2	NL
Pedinogyra effosa	24	3	2	NL
Elasmias manilense	25	3	2	NL
Pedinogyra allani	26	3	2	NL
Dendronitor inscensa	31	3	2	NL
Camaenidae mv 2	32	3	2	NL
Camaenidae bl 55	38	3	2	NL
Meridolum bowdenae	42	3	2	NL
Quistrachia monogramma	49	3	2	NL
Helicarionidae cy 8	87	3	2	NL
Gloreugenia blackalli	11	3	3	NL
Camaenidae wt 5	11	3	3	NL
Bothriembryon rhodostomus	11	3	3	NL
Camaenidae nn 3	12	3	3	NL
Camaenidae sq 5	12	3	3	NL
Punctidae st 3	12	3	3	NL
Pernagera a	12	3	3	NL
Bothriembryon jacksoni cf.	13	3	3	NL
Bothriembryon notatus	13	3	3	NL

Elasmias terrestris	14	3	3	NL
Helicarion leopardina	14	3	3	NL
Amplirhagada varia	15	3	3	NL
Pedinogyra sq 1	15	3	3	NL
Bothriembryon revectus	17	3	3	NL
Charopidae br 15	18	3	3	NL
Austrorhytida glaciamans	18	3	3	NL
Charopidae nn 15	18	3	3	NL
Helicarionidae ne 2	18	3	3	NL
Helicarionidae wt 15	19	3	3	NL
Oreomava cannfluviatilus	19	3	3	NL
Montidelos orcadis	20	3	3	NL
Gyrocochlea curtisiana	20	3	3	NL
Gloreugenia praecursoris	21	3	3	NL
Amplirhagada osmondi	22	3	3	NL
Camaenidae bl 28	22	3	3	NL
Pygmipanda kershawi	22	3	3	NL
Westracystis fredaslini	22	3	3	NL
Charopidae br 28	23	3	3	NL
Omphaloropa varicosa	23	3	3	NL
Sinumelon vagente	23	3	3	NL
Victaphanta atramentaria	24	3	3	NL
Westraltrachia limbana	24	3	3	NL
Gloreugenia cognata	25	3	3	NL
Pupisoma sn 1	25	3	3	NL
Meridolum depressa	25	3	3	NL
Helicarion dispositus	26	3	3	NL
Torresitrachia crawfordi	26	3	3	NL
Rotacharopa densilamellata	27	3	3	NL
Sinumelon gawleri	28	3	3	NL
Amplirhagada confusa	29	3	3	NL
Helicarionidae bl 9	29	3	3	NL
Austrochloritis ascensa	31	3	3	NL
Westraltrachia rotunda	31	3	3	NL
Setobaudinia calvitia	33	3	3	NL
Xanthomelon sphaeroidea	36	3	3	NL
Torresitrachia umbonis	36	3	3	NL
Bothriembryon perobesus	37	3	3	NL
Cupedora rufofasciata	41	3	3	NL
Thularion semoni	42	3	3	NL
Sinumelon flindersi	45	3	3	NL
Torresitrachia monticola	45	3	3	NL
Torresitrachia amaxensis	45	3	3	NL
Xanthomelon ruberpumilio	48	3	3	NL
Westraltrachia derbyi	53	3	3	NL
Tarocystis antiqua	54	3	3	NL
Melostrachia acuticostata	55	3	3	NL
Cupedora lorioliana	60	3	3	NL
Trozena morata	60	3	3	NL
Amplirhagada mitchelliana	62	3	3	NL

Bothriembryon indutus	64	3	3	NL
Xanthomelon prudhoensis	64	3	3	NL
Sinumelon dulcensis	77	3	3	NL
Pleuroxia oligopleura	82	3	3	NL
Gastrocopta queenslandica	18	4	1	NL
Rhytididae br 3	26	4	1	NL
Sphaerospira incei lessoni	83	4	1	NL
Cylindrovertilla kingi	16	4	2	NL
Charopidae mv 23	21	4	2	NL
Camaenidae bl 17	43	4	2	NL
Discocharopa vigens	12	4	3	NL
Strangesta alpica	13	4	3	NL
Posorites fucata	14	4	3	NL
Charopidae mv 33	15	4	3	NL
Sinumelon aversum	152	4	3	NL
Pleuroxia adcockiana	164	4	3	NL
Helicarionidae ne 5	21	4	3	NL
Queridomus grenvillei	23	4	3	NL
Hedleyella maconelli	23	4	3	NL
Austrochloritis sn 8	28	4	3	NL
Camaenidae st 10	29	4	3	NL
Helicarionidae mq 7	31	4	3	NL
Torresitrachia weaberana	33	4	3	NL
Meridolum nn 6	35	4	3	NL
Bothriembryon esperantia	37	4	3	NL
Meridolum duralensis	48	4	3	NL
Neveritis aridorum	78	4	3	NL
Egilomen globosa	11	4	4	NL
Charopidae sn 23	11	4	4	NL
Coneuplecta pampini	11	4	4	NL
Semotrachia setigera	114	4	4	NL
Helicarionidae nn 9	12	4	4	NL
Mussonula verax	12	4	4	NL
Meridolum ne 16	132	4	4	NL
Charopidae br 1	14	4	4	NL
Charopidae br 12	14	4	4	NL
Charopidae br 3	14	4	4	NL
Noctepuna cerea	14	4	4	NL
Camaenidae mv 1	15	4	4	NL
Sphaerospira sardalabiata	15	4	4	NL
Helicarionidae nn 8	16	4	4	NL
Pupoides myoporinae	17	4	4	NL
Charopidae nn 8	17	4	4	NL
Biomphalopa concinna	18	4	4	NL
Charopidae mv 4	18	4	4	NL
Helicarionidae sq 7	19	4	4	NL
Gyrocochlea iuloidea	19	4	4	NL
Nitor br 7	19	4	4	NL
Charopidae sp d	21	4	4	NL
Camaenidae cy 10	24	4	4	NL

Rotacharopa kessneri	25	4	4	NL
Ventopelita bellengerensis	26	4	4	NL
Helicarionidae nn 4	27	4	4	NL
Subulina octona	27	4	4	NL
Charopidae sn 14	29	4	4	NL
Somniopupa scotti	30	4	4	NL
Helicarionidae nn 5	32	4	4	NL
Charopidae sn 26	35	4	4	NL
Rhytididae sq 9	40	4	4	NL
Camaenidae sq 15	42	4	4	NL
Helicarionidae sn 3	43	4	4	NL
Sphaerospira zebina	71	4	4	NL
Sinumelon perinflata	77	4	4	NL
Galadistes ne 15	97	4	4	NL
Elsothera limula	46	5	1	NL
Bothriembryon sedgwicki	19	5	2	NL
Cupedora patruelis	37	5	2	NL
Saladelos strangeoides	16	5	3	NL
Elsothera brazieri	24	5	3	NL
Torresiropa spaldingi	27	5	3	NL
Helicarionidae mq 9	30	5	3	NL
Sphaerospira informis	81	5	3	NL
Charopidae br 2	12	5	4	NL
Rhophodon consobrinus	13	5	4	NL
Charopidae sq 28	14	5	4	NL
Setomedea aculeata	16	5	4	NL
Pupoides ischnus	17	5	4	NL
Discocharopa mimosa	19	5	4	NL
Coenocharopa sordidus	31	5	4	NL
Sphaerospira etheridgei	43	5	4	NL
Ventopelita leucocheilus	45	5	4	NL
Bothriembryon onslowi	46	5	4	NL
Austrochloritis layardi	47	5	4	NL
Tasmaphena lamproides	52	5	4	NL
Sphaerospira incei curtisiana	67	5	4	NL
Meridolum sn 18	76	5	4	NL
Sinumelon expositum	91	5	4	NL
Bothriembryon distinctus	106	5	5	NL
Saladelos nn 3	11	5	5	NL
Rhagada convicta	110	5	5	NL
Cystopeltidae br 1	13	5	5	NL
Pillomena nivea	14	5	5	NL
Helicarionidae mq 3	14	5	5	NL
Gyrocochlea vinitincta	17	5	5	NL
Cystopelta st 1	19	5	5	NL
Camaenidae sn 20	19	5	5	NL
Austrochloritis st 2	23	5	5	NL
Charopidae ne 8	24	5	5	NL
Gyrocochlea impressa	24	5	5	NL
Sinumelon bednalli	**24**	**5**	**5**	**EN**

Gloreugenia coxeni	25	5	5	NL
Helicarionidae br 1	27	5	5	NL
Sphaerospira mazee	28	5	5	NL
Charopidae nn 16	30	5	5	NL
Succinea interioris	30	5	5	NL
Calvigenia blackmani	47	5	5	NL
Helicarionidae bl 12	55	5	5	NL
Rhagada tescorum	56	5	5	NL
Pupoides eremicolus	59	5	5	NL
Sinumelon kalgum	61	5	5	NL
Meridolum gulosa	63	5	5	NL
Camaenidae bl 53	64	5	5	NL
Xanthomelon jannellei	69	5	5	NL
Pleuroxia polypleura	73	5	5	NL
Bothriembryon kendricki	76	5	5	NL
Pleuroxia elfina	77	5	5	NL
Camaenidae sq 4	40	6	3	NL
Gyrocochlea sp.	14	6	4	NL
Roblinella curacoae	19	6	4	NL
Bothriembryon costulata	57	6	4	NL
Tornatellinops pressus	68	6	4	NL
Rhytididae sq 4	21	6	5	NL
Charopidae sn 13	29	6	5	NL
Succinea st 1	32	6	5	NL
Pillomena dandenongensis	32	6	5	NL
Gyrocochlea cinnamea	34	6	5	NL
Allocharopa kershawi	34	6	5	NL
Gastrocopta deserti	40	6	5	NL
Amimopina macleayi	84	6	5	NL
Oreomava johnstoni	25	7	4	NL
Pernagera tamarensis	19	7	5	NL
Papuexul bidwilli	21	7	5	NL
Cupedora sutilosa	30	7	5	NL
Euconulus fulvus	42	7	5	NL
Gastrocopta hedleyi	47	7	5	NL
Rhytididae bl 2	62	7	5	NL
Sphaerospira yulei	83	7	5	NL
Elasmias wakefieldiae	39	8	4	NL
Strangesta gawleri	27	8	5	NL
Rhytididae sq 7	59	8	5	NL
Pernagera tasmaniae	37	9	4	NL

Trap-door Spiders (Mygalomorphae)

This is a broad group of spiders that includes not only the typical trap-door-type spiders, but also the funnel web spiders. Hence, they are a relatively known group of spiders. The ANHAT database has 9009 records for 609 species and subspecies of trap-door spiders. Twenty-one species account for approximately 50% of the total species records in ANHAT. These species had over 70 records each (**Table 61**).

Table 61 Trap-door spider species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% total records
Atrax su	70	0.78
Australothele jamiesoni	73	0.81
Hadronyche or	74	0.82
Missulena insignis	75	0.83
Hadronyche mar	78	0.87
Aganippe subtristis	78	0.87
Misgolas gracilis	81	0.90
Hadronyche formidabilis	110	1.22
Hadronyche maq	121	1.34
Gaius villosus	125	1.39
Hadronyche venenata	135	1.50
Idiosoma sigillatum	164	1.82
Seqocrypta jakara	185	2.05
Hadronyche versuta	201	2.23
Misgolas rapax	222	2.46
Chenistonia tepperi	229	2.54
Missulena bradleyi	351	3.90
Missulena granulosa	383	4.25
Aname mainae	442	4.91
Missulena occatoria	666	7.39
Atrax robustus	666	7.39
Total	4529	50.27

There are relatively few or very few records available for the majority of the trap-door spiders recorded in the ANHAT database. Four hundred and eighty-one species had 10 or fewer individual site records in the ANHAT database and 215 of these had just one record and a further 83 just two records (**Table 62**). Specific habitat associations are not available for a number of the listed species, nor can many of those with listed information be considered to be highly accurate given there are so few records available. However, the vast majority of species with a recorded habitat type come from forests, which reflects the general habitat preference for this group of spiders. There are very few species in this list that are known from inland, more arid areas, indicating this group does not inhabit such environments with any frequency. The listed species are widespread through the states in more mesic environments and there are no significant trends evident in regions of Australia where trap-doors are more likely to be poorly recorded. However, only 13 species on the list

come from southeastern Australia, which appears to be a relatively small number. The survey levels are likely to be greatest in this most populated area of Australia, which would explain species in this area tending to have greater numbers of records. No species of trap-door spider has been assessed for listing under the EPBC Act as yet.

Table 62 Trap-door spider species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Aganippe 1	1	0.00	?		100	NL
Aganippe 7	1	0.00	?		100	NL
Aganippe ballidu	1	0.00	SW?		100	NL
Aganippe charlesi	1	100.00	?		100	NL
Aganippe cupulifex spp *grp*	1	0.00	SW	For, WL	100	NL
**Aganippe* location 43	1	0.00	SW	For, WL	100	NL
Aganippe dorre	1	100.00	Dorre Is.		100	NL
**Aganippe* location 44	1	0.00	SW		100	NL
**Aganippe* location 45	1	100.00	SW		100	NL
**Aganippe* location 46	1	100.00	SW		100	NL
Aganippe longbottomi	1	0.00			100	NL
**Aganippe* location 48	1	0.00			100	NL
**Aganippe* location 49	1	0.00			100	NL
Aganippe mileura	1	0.00			100	NL
Aganippe nannup	1	0.00	SW		100	NL
Aganippe nugadong	1	0.00			100	NL
Aganippe proto-idiosoma	1	0.00	SW	SL	100	NL
Aganippe proto-idiosoma sp3	1	0.00	SW	SL	100	NL
**Aganippe* location 63	1	0.00	SC		100	NL
Aganippe simpsoni sp grp	1	100.00	SCI	GrL	100	NL
**Aganippe* location 65	1	0.00	SWI		100	NL
Aganippe wa_occ_gp	1	0.00	SW		100	NL
Aganippe winsori	1	0.00	SE	For?	100	NL
Aname	1	100.00	NE?		100	NL

blackdownensis						
Aname camara	1	0.00	NE		100	NL
Aname false black wish-bone	1	0.00			100	NL
**Aname* location 68	1	100.00	NC		100	NL
**Aname* location 72	1	0.00			100	NL
Aname mainae sp grp	1	100.00	SC		200	NL
Aname metropolitan	1	0.00			100	NL
Aname nov near armigera	1	0.00			100	NL
Aname nov?	1	0.00			100	NL
Aname nw aust	1	0.00	NW		100	NL
**Aname* location 73	1	0.00	WC		100	NL
**Aname* location 75	1	0.00	EC?		100	NL
Aname river wish-bone	1	0.00			100	NL
Aname robertsi	1	100.00			100	NL
Aname robertsorum	1	100.00	EC		100	NL
Aname robusta	1	100.00	SC	?	200	NL
Aname tigrina	1	100.00	NE		100	NL
Aname tropica	1	100.00	NE		100	NL
Aname villosa?	1	0.00	SW	For	100	NL
Aname wa	1	0.00	SW		100	NL
**Aname* location 105	1	0.00	SW		100	NL
*Aname wa_paraemb*2	1	0.00	W		100	NL
*Aname wa_paraemb*3	1	0.00	W		100	NL
Aname wa_rastellum	1	0.00	W		100	NL
Aname wa_squarebulb	1	0.00	W		100	NL
Aname wheatbelt	1	100.00	WCI		100	NL
Aname wish-bone sp*p grp*	1	0.00			100	NL
Anidiops a	1	100.00			100	NL
Anidiops manstridgei sp*p grp*	1	0.00	SC	WL, SL	100	NL
*Anidiops sa_*2	1	0.00	SC		100	NL
Anidiops villosus	1	0.00	SW	SL	200	NL
*Anidiops wa_*1216	1	0.00	SW		100	NL
Arbanitis ballidu	1	0.00	EC		100	NL
*Arbanitis idio_newspecies_*	1	0.00	?	?	100	NL
**Arbanitis* location 50	1	0.00	EC		100	NL
**Arbanitis* location 52	1	0.00	EC?		200	NL

Arbanitis ornatus	1	0.00	EC		100	NL
Arbanitis q_e	1	100.00	EC		100	NL
**Arbanitis* location 53	1	0.00	SW		100	NL
Arbanitis woolleyae	1	0.00	EC		100	NL
Atrax src 0253	1	100.00	E?	For	100	NL
Atrax src 0254	1	100.00	E?	For	100	NL
Aurecocrypta katersi	1	0.00	SW	For, WL	100	NL
Aurecocrypta lugubris	1	0.00			200	NL
Australothele bicuspidata	1	100.00	EC	For	100	NL
C_Migas v_cobon	1	0.00			400	NL
Cataxia dietrichae	1	0.00	EC	For	200	NL
Cataxia victoriae	1	100.00	SE	For	100	NL
Cethegus daemeli	1	100.00	NE	For	100	NL
Cethegus elegans	1	0.00	NE	For	100	NL
Cethegus hanni	1	0.00	NE	For	100	NL
Cethegus nov	1	100.00			100	NL
**Chenistonia* location 77	1	100.00			100	NL
Chenistonia logs sp	1	100.00			100	NL
Chenistonia maculata spp grp	1	100.00	SE	For	100	NL
Chenistonia sp*inigera*	1	100.00			100	NL
**Chenistonia* location 79	1	100.00	SW?		100	NL
**Chenistonia* Location 80	1	0.00	SW?		100	NL
**Chenistonia* location 81	1	0.00	SW?		100	NL
Conothele 1	1	0.00	NE		100	NL
Conothele 2	1	0.00	NE		100	NL
Conothele 3	1	100.00	NE		100	NL
**Conothele* location 82	1	100.00	NE		100	NL
**Conothele* location 84	1	0.00	NE		100	NL
**Conothele* location 116	1	0.00	NE		100	NL
Coremiocnemis q_tropix	1	100.00	NE	Univoltine	100	NL
Det sp	1	100.00	?		100	NL
Eucyrtops corrigin/kondiuim sp	1	0.00	SW		100	NL
Eucyrtops eremaea	1	0.00	SW	SL	100	NL
Eucyrtops nov	1	100.00	SW		100	NL

Eucyrtops torbayensis	1	0.00	SW	WL	200	NL
**Eucyrtops* location 123	1	0.00	SW	WL	100	NL
**Eucyrtops* location 124	1	0.00	SW	WL	300	NL
Euoplos sp	1	0.00	?	?	100	NL
Euoplos sp*inipes*	1	0.00	EC	For, WL	200	NL
Euoplos variabilis	1	0.00	EC	For	600	NL
Gaius nov	1	100.00			100	NL
Gen Nov sp	1	0.00	?	?	100	NL
**Gen Nov* location 126	1	0.00	W		100	NL
Hadronyche an	1	0.00			100	NL
Hadronyche ba	1	0.00			100	NL
Hadronyche da	1	0.00			100	NL
Hadronyche ly	1	0.00			100	NL
Hadronyche ra	1	100.00			100	NL
Hadronyche src 0246	1	100.00			100	NL
Hadronyche src 0247	1	100.00			100	NL
Heteromigas dovei	1	0.00	Tas	?	100	NL
Heteromigas terraereginae	1	0.00	NE, Mon		100	NL
**Homogona* location 53b	1	100.00	SW		100	NL
Idiommata indet	1	0.00	?	?	100	NL
**Idiommata* location 55	1	0.00	SC?		100	NL
**Idiommata* location 56	1	0.00	?		100	NL
Idiosoma nov	1	0.00	SW	For?	100	NL
**Idiosoma* location 60	1	0.00	SW	For	100	NL
Ixamatus lornensis	1	100.00	EC	For	100	NL
Ixamatus rozefeldsi	1	0.00	EC	For	100	NL
Kwonkan anatolion	1	100.00	SC	SL	100	NL
Kwonkan moriartii	1	100.00	SWI		100	NL
Kwonkan src 0240	1	0.00	SW		100	NL
*Kwonkan wa*_1	1	0.00	SW		100	NL
**Kwonkan* location 85	1	0.00	SW		100	NL
Kwonkan wa_zuytdorp	1	0.00	SW		100	NL
Mandjelia exasperans	1	100.00	NE		100	NL
Mandjelia fleckeri	1	100.00	NE		100	NL
Mandjelia galmarra	1	100.00	NE		100	NL
Mandjelia	1	100.00	NE		100	NL

iwupataka						
Mandjelia macgregori	1	0.00	NE		100	NL
Mandjelia madura	1	0.00	NE		100	NL
Mandjelia mccrackeni	1	100.00	NE		100	NL
Mandjelia rejae	1	100.00	NE		100	NL
*Mandjelia wa_salt*1	1	0.00	NE		100	NL
**Mandjelia* location 90	1	0.00	NE		100	NL
Masteria sp	1	100.00	NE?	For	100	NL
**Merredinia* location 92	1	100.00	SW	WL, SL	100	NL
**Merredinia* location 93	1	0.00	SW	WL, SL	100	NL
Misgolas 12	1	100.00	SE		100	NL
Misgolas elegans	1	0.00	SE	For	200	NL
Missulena location 128	1	0.00	SW		100	NL
*Missulena occ*_1025	1	0.00	SW?		100	NL
*Missulena occ*_1026	1	0.00	SW?		100	NL
*Missulena occwheat*913	1	0.00	SEI	WL?	100	NL
**Missulena* location 129	1	0.00	S		100	NL
**Missulena* location 130	1	0.00	S		100	NL
Missulena small black sp.	1	0.00			100	NL
Missulena wa_bassendean	1	0.00	SW?		100	NL
*Missulena wa_gran_*387	1	0.00	SW?		100	NL
Missulena wa_gran_tiny	1	0.00	SW?		100	NL
Moggridgea australis	1	0.00	SC		200	NL
Moruga doddi	1	100.00	NC-NE		100	NL
Moruga fuliginea	1	0.00	NC-NE		100	NL
Moruga insularis	1	100.00	NC-NE		100	NL
Moruga kimberleyi	1	100.00	NC-NE		100	NL
Moruga thorsborneorum	1	100.00	NC-NE		100	NL
Moruga wallaceae	1	0.00	NC-NE		100	NL
Namea callemonda	1	0.00	EC	For	100	NL
**Namea* location 130a	1	0.00	NE	For	100	NL
Namirea fallax	1	0.00	EC	For	100	NL

Namirea johnlyonsi	1	100.00		For	100	NL
Nemesiidae d	1	0.00			100	NL
Ozicrypta clarki	1	0.00	NC-NE		100	NL
Ozicrypta combeni	1	0.00	NC-NE		100	NL
Ozicrypta digglesi	1	0.00	NC-NE		200	NL
Ozicrypta mcarthurae	1	0.00	NC-NE		100	NL
Ozicrypta reticulata	1	100.00	EC		300	NL
Ozicrypta tuckeri	1	100.00	NC-NE		100	NL
Ozicrypta walkeri	1	0.00	NC-NE		100	NL
Porthedland sp *nov*	1	0.00	WC	WL?	100	NL
**Selenocosmia* location 94	1	100.00	SW		100	NL
Selenocosmia wallacei ms name	1	0.00	SW?		100	NL
Seqocrypta bancrofti	1	0.00	NE		100	NL
Seqocrypta sp	1	0.00	NE		100	NL
**Stanwellia* location 96	1	0.00	SE		100	NL
Stanwellia v_gow	1	0.00	SE		100	NL
**Stanwellia* location 97	1	100.00	SW		100	NL
Striamea gertschi	1	100.00			100	NL
Synothele boongaree	1	0.00	W?		100	NL
Synothele goongarrie	1	0.00	W?		100	NL
Synothele harveyi	1	100.00	W?		100	NL
Synothele indet	1	0.00	W?		100	NL
Synothele karara	1	0.00	W?		100	NL
Synothele koonalda	1	100.00	W?		100	NL
Synothele longbottomi	1	100.00	W?		100	NL
Synothele lowei	1	0.00	W?		100	NL
Synothele moonabie	1	0.00	W?		100	NL
Synothele nov	1	100.00	W?		100	NL
Synothele pectinata	1	0.00	W?		100	NL
Synothele rastelloides	1	0.00	W?		100	NL
Synothele rubripes	1	0.00	W?		100	NL
Teyl antelipoides	1	0.00	SW		100	NL
Teyl goldfields sp	1	0.00	SWI		100	NL
Teyl luculentus sp grp	1	0.00	SW	WL, SL	100	NL
Teyl mandgedal sp grp	1	0.00	SW		100	NL
**Teyl* location 131	1	0.00	SW		100	NL
**Teyl* locaiton 132	1	0.00	SW		100	NL
**Teyl* locaiton 133	1	0.00	SW		100	NL

**Teyl* locaiton 134	1	0.00	SW		100	NL
**Teyl* location 135	1	100.00	SW		100	NL
**Teyl* location 136	1	100.00	SW		100	NL
**Teyl* location 137	1	100.00	SW		100	NL
Teyl waldockae	1	100.00	SW		100	NL
*Teyl wheat*2	1	0.00	SWI		100	NL
Theraphosidae sp.	1	0.00			700	NL
Trittame berniesmythi	1	0.00	NE	RF	100	NL
Trittame mccolli	1	0.00	NE	RF	100	NL
Trittame thorelli	1	100.00	NE	RF	100	NL
Tungari monteithi	1	0.00			100	NL
Yilgarnia a	1	0.00	SW		100	NL
Yilgarnia bougainville	1	0.00	SW		100	NL
Yilgarnia minuta	1	100.00	SW		100	NL
**Yilgarnia* location 137a	1	0.00	SW		100	NL
Zophorame covacevichae	1	0.00	NE	RF	100	NL
Zophorame hirsti	1	0.00	?		100	NL
Aganippe castellum	2	0.00	WC		200	NL
Aganippe coastal plain sp	2	0.00	SW		100	NL
Aganippe indet	2	50.00			200	NL
Aganippe proto-idiosoma sp1	2	0.00	SW	SL	200	NL
Aganippe simpsoni	2	50.00	SCI	GrL	300	NL
**Aganippe* location 64	2	0.00	SWI		100	NL
Aname atra	2	50.00	SCI?		200	NL
**Aname* location 66	2	100.00	Barrow Is.		200	NL
Aname brown wish-bone	2	50.00			200	NL
Aname location 67	2	0.00	NE?		200	NL
Aname houtmani	2	0.00	Houtman Is?		300	NL
**Aname* location 70	2	0.00	NW		200	NL
Aname nt sp	2	100.00	CN		100	NL
**Aname* location 74	2	0.00	WC		200	NL
**Aname* location 99	2	0.00	SW		200	NL
**Aname* location 101	2	0.00	SW?		200	NL
**Aname* location 104	2	0.00	W		200	NL
Aname wa_m_rast_qry	2	0.00	W		200	NL
**Aname* location 110	2	50.00	W		200	NL
**Aname* location 111	2	0.00	WC		200	NL

**Aname* location 112	2	0.00	WC		100	NL
Aname wa_streich	2	0.00	W		200	NL
Anidiops sa_baird	2	50.00	SC		200	NL
Anidiops whitei	2	0.00	SC		300	NL
Arbanitis echo ms name	2	100.00	EC		100	NL
Arbanitis inornatus	2	0.00	EC		200	NL
Arbanitis macmillani	2	50.00	SW		200	NL
Caledothele australiensis	2	0.00			600	NL
Cethegus barraba	2	50.00	EC	For	200	NL
Cethegus colemani	2	0.00	NE	For	200	NL
Cethegus multispinosus	2	0.00	NE	For	200	NL
**Cethegus* location 76	2	50.00	SW	For, WL?	200	NL
Chenistonia b	2	50.00			200	NL
**Chenistonia* location 76a	2	100.00	SW		100	NL
**Chenistonia* location 78	2	50.00			200	NL
Chenistonia wa_v_long_emb	2	50.00	SW		200	NL
**Conothele* location 119	2	0.00	NE		200	NL
Coremiocnemis q_lizard	2	100.00	Lizard Is.?		100	NL
Eucyrtops latior sp*p grp*	2	100.00	SW	For	100	NL
Eucyrtops latior sp*p grp* sp *nov*	2	0.00	SW	For	200	NL
**Eucyrtops* location 125	2	50.00	SW	WL	200	NL
Gaius goldfields sp	2	0.00	SW		200	NL
Hadronyche src 0248	2	50.00			200	NL
Homogona nov	2	100.00			200	NL
Idiommata blackwalli	2	0.00	W	For, WL, SL	200	NL
Idiommata fusca	2	50.00	NE	For, WL?	300	NL
Kwonkan 2	2	0.00	SW		200	NL
Kwonkan eboracum	2	0.00	SW	SL	200	NL
**Kwonkan* location 61	2	0.00	SC		100	NL
Kwonkan silvestre	2	0.00	SW		200	NL
**Kwonkan* location 87	2	50.00	SW		200	NL
**Kwonkan* location	2	50.00	SW		200	NL

88						
Kwonkan wa_sp1	2	0.00	SW		200	NL
Kwonkan wonganensis	2	0.00	SW	SL	200	NL
Mandjelia colemani	2	0.00	NE		200	NL
Mandjelia thorelli	2	0.00	NE		200	NL
**Mandjelia* location 91	2	50.00	NE		200	NL
Migas plomleyi	2	0.00	Tas		200	NL
Migas variapalpus	2	100.00	NE		200	NL
Misgolas 11	2	50.00	SE		200	NL
**Missulena* location 127	2	50.00	SW	For, WL	200	NL
Moggridgea p	2	100.00	SW?		100	NL
Moggridgea tingle	2	50.00	SW		300	NL
Moruga heatherae	2	100.00	NC-NE		100	NL
Nemesiidae e	2	0.00			200	NL
Ozicrypta clyneae	2	50.00	NC-NE		200	NL
Ozicrypta mcdonaldi	2	100.00	NC-NE		100	NL
Ozicrypta palmarum	2	0.00	NC-NE		300	NL
Ozicrypta pearni	2	100.00	NC-NE		100	NL
Ozicrypta sinclairi	2	0.00	NC-NE		100	NL
Paraembolides cannoni	2	50.00	EC, Mon	For	200	NL
Stanwellia occidentalis	2	0.00	SC	SL	200	NL
Synothele goongarrie sp 1	2	0.00	W?		200	NL
Synothele houstoni	2	50.00	W?		200	NL
Synothele meadhunteri	2	50.00	W?		200	NL
Synothele taurus	2	50.00	W?		200	NL
Synothele yundamindra	2	0.00	W?		200	NL
Teyl 6	2	50.00	SW		200	NL
Teyl door building sp	2	100.00	SW		200	NL
Trittame augusteyni	2	50.00	NE	RF	200	NL
Trittame ingrami	2	100.00	EC	RF	100	NL
Trittame stonieri	2	0.00	NE	RF	100	NL
Xamiatus ilara	2	100.00	NE	For	200	NL
**Aganippe* location 47	3	0.00	SWI		200	NL
Aname tasmanica	3	100.00	Tas		100	NL
Aname turrigera	3	33.33	SW-SC		300	NL
**Aname* location 100	3	0.00	SW		400	NL
Aname wa_edel	3	33.33	SW		400	NL

**Aname* location 108	3	0.00	W		400	NL
Aname wa_qvic_commabul b	3	33.33	W		300	NL
Aname wa_qvic_paraemb	3	33.33	W		300	NL
**Aname* location 113	3	0.00	W		300	NL
*Aname wa_woodstock*3	3	0.00	NW		100	NL
Anidiops manstridgei	3	33.33	SC	WL, SL	300	NL
Anidiops nov	3	0.00	?	?	300	NL
Arbanitis binnaburra ms name	3	0.00	EC, Mon	For	200	NL
**Arbanitis* location 51	3	0.00	SW		200	NL
Australothele montana	3	66.67	SE	For	200	NL
**Australothele* location 53a	3	0.00	EC	For	300	NL
Blakistonia 2	3	66.67	SC	For?	300	NL
Carrai afoveolata	3	33.33	EC	For	200	NL
Cataxia maculata	3	0.00	EC	For	400	NL
Chenistonia caeruleomontana	3	0.00	EC		100	NL
Chenistonia maculata	3	0.00	SE	For	300	NL
Chenistonia montana	3	33.33	EC		300	NL
Chenistonia tepperi?	3	66.67	SC		300	NL
**Conothele* location 115	3	0.00	NE		100	NL
**Conothele* location 118	3	33.33	NE		300	NL
Gaius jonesae	3	0.00			100	NL
*Gaius wa*2	3	0.00	SW		300	NL
Hadronyche flindersi	3	0.00	SC		200	NL
Hadronyche la	3	66.67			300	NL
Hadronyche walkeri	3	0.00			200	NL
Homogona stirlingi	3	100.00	SW		100	NL
**Idiommata* location 57	3	0.00	W		300	NL
Kwonkan goongarriensis	3	33.33	SW	SL	300	NL
*Kwonkan wa_salt*1	3	0.00	SW		300	NL

Mandjelia anzses	3	100.00	NE?		500	NL
Mandjelia qantas	3	0.00	NE		100	NL
Misgolas maculosus	3	0.00	SE	For	300	NL
Misgolas mascordi	3	33.33	E		300	NL
Missulena 8	3	33.33	?		300	NL
*Missulena occ*_1028	3	0.00	SW?		300	NL
Missulena rugosa	3	33.33			400	NL
Namea cucurbita	3	0.00	EC	For	300	NL
Namea excavans	3	33.33	EC	For	200	NL
Namea olympus	3	100.00	NE, Mon	For	100	NL
Namea saundersi	3	100.00	NE	For	200	NL
Nemesiidae c	3	0.00			200	NL
Ozicrypta eungella	3	33.33	NC-NE		300	NL
Ozicrypta hollinsae	3	0.00	NC-NE		200	NL
Ozicrypta kroombit	3	100.00	NC-NE		100	NL
Pseudoteyl vancouveri	3	100.00	W		200	NL
Synothele arrakis	3	0.00	W?		100	NL
Synothele mullaloo	3	0.00	W?		200	NL
Teranodes src 0255	3	66.67	SE?	For	200	NL
Teyl minimus	3	66.67	SW		200	NL
Trittame rainbowi	3	100.00	NE	RF	200	NL
Yilgarnia currycomboides	3	33.33	SW		300	NL
Zophorame gallonae	3	0.00	Torres St.	For	200	NL
Zophorame simoni	3	66.67	NE	RF	400	NL
Aganippe cupulifex	4	50.00	SW	For, WL	300	NL
Aganippe nov (twig-lining spp grp)	4	25.00			400	NL
Aganippe occidentalis sp grp	4	0.00	WC	For	400	NL
Aname armigera	4	0.00	SWI	WL	500	NL
Aname collinsorum	4	25.00	NE		400	NL
**Aname* location 103	4	0.00	NW		300	NL
Chenistonia tepperi sp grp	4	75.00	SC		400	NL
**Conothele* location 83	4	0.00	NE		100	NL
**Conothele* location 117	4	0.00	NE		500	NL
Eucyrtops riparia	4	0.00	SW	WL	400	NL
**Eucyrtops* location 120	4	50.00	SW	WL	300	NL
**Eucyrtops* location 122	4	75.00	SW	WL	100	NL
Idioctis yerlata	4	75.00	NE	Intertidal	200	NL
*Kwonkan wa_salt*2	4	25.00	SW		400	NL

Mandjelia banksi	4	25.00	NE		400	NL
**Mandjelia* location 89	4	100.00	NE		400	NL
Migas nitens	4	0.00	Tas	Littoral	200	NL
Missulena torbayensis	4	50.00	SW		400	NL
Namirea montislewisi	4	100.00	NE	For	300	NL
Ozicrypta wrightae	4	75.00	NC-NE		400	NL
Paraembolides boycei	4	50.00	EC	For	400	NL
**Stanwellia* location 95	4	100.00	SE		300	NL
Synothele butleri	4	50.00	W?		400	NL
Synothele durokoppin	4	0.00	W?		300	NL
Trittame xerophila	4	50.00	NE-EC	For	400	NL
Troglodiplura lowryi	4	0.00	SC	Caves	100	NL
Troglodiplura lowryii	4	50.00			300	NL
Tungari kenwayae	4	50.00			300	NL
Aganippe jessupi	5	20.00			400	NL
Aganippe robusta	5	20.00	SC		600	NL
Aganippe smeatoni	5	0.00	SC	For	900	NL
**Aname* location 69	5	100.00	NC		200	NL
Aname kwonkoides spp *grp*	5	0.00			200	NL
Arbanitis nov	5	0.00			500	NL
Bymainiella src 0249	5	100.00	EC	For	300	NL
Cataxia babindaensis	5	20.00	EC	For	400	NL
Cethegus broomi	5	0.00	EC	For	200	NL
Cethegus pallipes	5	20.00	NE	For	300	NL
Eucanippe nov	5	40.00	?		400	NL
Hadronyche eyrei	5	0.00	SC		300	NL
Hadronyche mot	5	100.00			400	NL
Homogona bolganupensis	5	20.00			100	NL
Idiommata iridescens	5	0.00	NE	For	500	NL
**Idiommata* location 54	5	0.00	NE		500	NL
**Idiommata* location 56a	5	20.00	W		500	NL
**Idiommata* location 59	5	20.00	W		500	NL
Idiosoma hirsutum	5	0.00	SW	For, SL	200	NL
Kwonkan 1	5	0.00	SW		400	NL

Namea dahmsi	5	40.00	EC	For	500	NL
Namirea dougwallacei	5	100.00	EC?	For	100	NL
Ozicrypta etna	5	20.00	NC-NE		300	NL
Ozicrypta littleorum	5	60.00	NC-NE		600	NL
Ozicrypta wallacei	5	0.00	NC-NE		300	NL
Plesiothele fentoni	5	100.00	Tas	For	300	NL
Sason colemani	5	60.00	NE		200	NL
Stanwellia grisea	5	20.00	SE	For	800	NL
Synothele howi	5	20.00	W?		500	NL
Teyl 2	5	40.00	SW		500	NL
*Teyl wheat*4	5	40.00	SWI		500	NL
Trittame kochi	5	60.00	NE	RF	300	NL
Aname coastal plain	6	0.00			300	NL
Aname sp	6	0.00			700	NL
Aname wa_m_rast	6	0.00	W		500	NL
**Aname* location 106	6	0.00	W		600	NL
**Aname* location 109	6	33.33	SW		600	NL
Cethegus ischnotheloides	6	0.00	SC		600	NL
**Eucyrtops* location 121	6	33.33	SW	WL	400	NL
Hadronyche ke	6	16.67			100	NL
Idiommata location 58	6	0.00	W		600	NL
**Kwonkan* location 86	6	0.00	SW		300	NL
Mandjelia humphreysi	6	16.67	NE		600	NL
Merredinia damsonoides	6	0.00	SW	WL, SL	500	NL
Misgolas crispus	6	50.00	Tas	For	500	NL
Namea nebulosa	6	66.67	NE, Mon	For	500	NL
Namirea eungella	6	50.00	NE	For	600	NL
Namirea insularis	6	0.00	EC	For	300	NL
Nemesiidae b	6	0.00			200	NL
Paraembolides variabilis	6	0.00	EC	For	300	NL
Seqocrypta hamlynharrisi	6	33.33	NE		600	NL
Seqocrypta mckeowni	6	50.00	NE		600	NL
**Stanwellia* location 98	6	100.00	SW		400	NL
Teranodes otwayensis	6	66.67	SE	For	1200	NL
Xamiatus magnificus	6	33.33	NE	For	500	NL

Aganippe occidentalis	7	14.29	WC	For	700	NL
Aname distincta?	7	0.00	CE		500	NL
**Aname* location 71	7	71.43	NE	For	500	NL
**Aname* location 114	7	0.00	W		700	NL
Bymainiella monteithi	7	28.57	EC, Mon	RF	500	NL
Cataxia spinipectoris	7	0.00	EC	For	500	NL
Cethegus lugubris	7	0.00	NE	RF, For	200	NL
Chenistonia trevallynia	7	28.57	Tas	For	500	NL
Hadronyche ca	7	28.57			500	NL
Hadronyche mon	7	14.29			600	NL
Ixamatus candidus	7	28.57	EC	For	500	NL
Missulena rutraspina	7	28.57	S		900	NL
Namea calcaria	7	42.86	EC	For	600	NL
Namea capricornia	7	28.57	EC	For	700	NL
Ozicrypta microcauda	7	71.43	NC-NE		500	NL
Stanwellia oraria	7	57.14	SE		300	NL
Teyl 1	7	42.86	SW		700	NL
Trittame forsteri	7	42.86	NE	RF	600	NL
Aganippe modesta	8	12.50	SC	WL	800	NL
**Aname* location 102	8	37.50	SW		600	NL
Cataxia eungellaensis	8	37.50	EC	For	600	NL
Cethegus robustus	8	0.00	NE	For	800	NL
Ixamatus musgravei	8	87.50	EC	For	400	NL
Missulena 7	8	25.00	?		900	NL
Nemesiidae a	8	0.00	??		200	NL
Xamiatus bulburin	8	25.00	NE	For	500	NL
Aname wa_dianella	9	0.00	SW		800	NL
Australothele nothofagi	9	77.78	EC	For	700	NL
Eucyrtops latior	9	0.00	SW	For	700	NL
Hadronyche ka	9	22.22	SC		600	NL
Hadronyche ta	9	0.00			400	NL
Ixamatus fischeri	9	33.33	EC	For	600	NL
Moggridgea s	9	100.00	SW?		300	NL
**Paraembolides* location 62	9	22.22	EC, Mon	For	1000	NL
Selenocosmia rugosa ms name	9	11.11			900	NL
**Aname* location 107	10	30.00	W		900	NL
Atrax src 0252	10	60.00	E?	For	700	NL

Bymainiella polesoni	10	50.00	EC, Mon	For	800	NL
Chenistonia paludigena	10	40.00			1000	NL
Ozicrypta filmeri	10	0.00	NC-NE		800	NL
Paraembolides boydi	10	80.00	EC	For	700	NL
Teyl 3	10	30.00	SW		1000	NL

Removal of extinct and poorly recorded species leaves 7703 records in ANHAT for 128 species (and subspecies). The mean number of records per species for species with greater than 10 records was 60.2, with a mean of 23 for the percent of records in the NRS. Only 22 species of trap-door spiders had 45% or greater of individual site records located within the NRS (**Table 63**). This is most likely because spiders are collected more incidentally than in any other way and incidental records are most likely to come from private residences, which are not found in reserves. None of these species had 100% of their records within the NRS, however, three species had a reservation level above 80%. Most species with recorded habitat preferences come from forested environments, which are relatively well reserved environments. Forty-nine species had less than 10% of ANHAT records located within PAs (

Table 64), with 11 species not known to have any records within the NRS. Six of these 11 species are from eastern Australia. The majority of species in this list are from the southern Australia, with the next largest group found in the central regions. The two main habitat associations of poorly reserved species are forests and woodlands, with 17 and 14 respectively out of the 49 species with known preferences for these habitats. Twenty-six of the 49 species had no habitat information available.

Table 63 Trap-door spiders species with >45% of site records within the NRS.

Species	No. Records	Records in NRS	Location	Veg type	Area (km^2)	EPBC status
Stanwellia hoggi	31	14 (45.2%)	SE	For	1800	NL
Mandjelia brassi	11	5 (45.4%)	NE		700	NL
Namea bunya	11	5 (45.4%)	EC	For	900	NL
Missulena sp.	49	23 (46.9%)			4500	NL
Teyl nov	12	6 (50.0%)	SW		1100	NL
Xamiatus rubrifrons	20	10 (50.0%)	EC	For	1400	NL
Bymainiella terraereginae	53	29 (54.7%)	EC	For	1900	NL
Arbanitis q_bb	18	10 (55.6%)	ECI		400	NL
Teyl sp	65	38 (58.6%)	SW		4600	NL
Namea salanitri	17	10 (58.8%)	EC, Mon	For	1100	NL
Bymainiella lugubris	16	10 (62.5%)	EC, Mon	WL	400	NL
Chenistonia hickmani	12	8 (66.7%)	EC		600	NL
Mandjelia commoni	18	12 (66.7%)	NE		1600	NL
Namea dicalcaria	30	20 (66.7%)	EC	For	2000	NL

Ixamatus barina	52	35 (67.3%)	NE	For	2600	NL
Masteria toddae	44	30 (68.2%)	NE	For	2800	NL
Teranodes montana	23	16 (69.6%)	SE, Tas	For	2000	NL
Homogona cunicularia	28	21 (75.0%)	NE, Mon	For	1700	NL
Trittame loki	19	15 (78.9%)	NE	RF	1300	NL
Ozicrypta cooloola	15	12 (80.0%)	NC-NE		900	NL
Chenistonia earthwatchorum	31	25 (80.6%)	EC		2400	NL
Hadronyche al	18	16 (88.9%)			1300	NL

Table 64 Trap-door spider species with <10% of ANHAT records located within the NRS.

Species	No. Records	In NRS	Location	Veg type	Area (km^2)	EPBC status
Aganippe pelochroa	11	0 (0.0%)	SC	Gen	700	NL
**Aname* location 144	12	0 (0.0%)	NW		300	NL
Misgolas kirstiae	12	0 (0.0%)	E		100	NL
Aganippe berlandi	14	0 (0.0%)	ECI	WL	1200	NL
Kiama lachrymoides	18	0 (0.0%)	EC	For	1000	NL
Aname villosa	25	0 (0.0%)	SW	For	500	NL
Hadronyche il	27	0 (0.0%)			1200	NL
Xamiatus kia	28	0 (0.0%)	EC	For	1000	NL
Hadronyche mas	37	0 (0.0%)			700	NL
Aganippe planites	40	0 (0.0%)	EC	For	3200	NL
Aganippe montana	46	0 (0.0%)	SE		2700	NL
Idiosoma sigillatum	164	1 (0.6%)	SW	For	3700	NL
Hadronyche venenata	135	3 (2.2%)	Tas	For	2500	NL
Aganippe subtristis	78	2 (2.6%)	SC	For, WL	3200	NL
Selenocosmia stirlingi	38	1 (2.6%)	I	WL, SL, GrL	3400	NL
Arbanitis tasmanica	33	1 (3.0%)	Tas?		1100	NL
Hadronyche le	33	1 (3.0%)			1400	NL
Misgolas rapax	222	8 (3.6%)	SE	For	5800	NL
Missulena granulosa	383	14 (3.7%)	SW	For	12800	NL
Hadronyche mar	78	3 (3.8%)			4600	NL
Gaius villosus	125	5 (4.0%)	SW		8400	NL
Misgolas hubbardi	49	2 (4.1%)	E		1700	NL
Misgolas robertsi	24	1 (4.2%)	EC	For	400	NL
Missulena occatoria	666	28 (4.2%)	SE	For, WL	50700	NL
Hadronyche adelaidensis	23	1 (4.3%)	CS		1000	NL

Idiommata wa_goldenhair	45	2 (4.4%)	W		2800	NL
Hadronyche modesta	43	2 (4.6%)	SE		4200	NL
Selenocosmia sp.	42	2 (4.8%)			3600	NL
Misgolas dereki	61	3 (4.9%)	SE		1700	NL
Misgolas gracilis	81	4 (4.9%)	SE	For	3800	NL
Aname mainae	442	22 (5.0%)	SC		18000	NL
**Aname* location 142	19	1 (5.3%)	SWI		1000	NL
Misgolas melancholicus	52	3 (5.8%)	SE		2200	NL
Hadronyche wa	68	4 (5.9%)	W		4500	NL
Idiommata scintillans	33	2 (6.1%)	SC	WL, SL	3600	NL
**Aname* location 143	16	1 (6.2%)	NW		1100	NL
Synothele michaelseni	16	1 (6.2%)	SW	For	700	NL
Aganippe rhaphiduca sp grp	15	1 (6.7%)	SW	For	1600	NL
Idiommata wa_flaretip	15	1 (6.7%)	W		1600	NL
Hadronyche formidabilis	110	8 (7.3%)	EC	For	9500	NL
Hadronyche cerberea	67	5 (7.5%)	EC		4200	NL
Missulena bradleyi	351	27 (7.7%)	SE	?	17100	NL
Aname inimica	51	4 (7.8%)	EC		2000	NL
Atrax su	70	6 (8.6%)	E?	For	3400	NL
Idiosoma nigrum	23	2 (8.7%)	SW	WL	1800	NL
Aname distincta	34	3 (8.8%)	CE		3100	NL
Selenocosmia crassipes	45	4 (8.9%)	NC-NE	For, SL	2600	NL
**Aname* location 145	11	1 (9.1%)	EC		1100	NL
Missulena 6	33	3 (9.1%)	?		3100	NL

In keeping with the very limited number of records available for this group of spiders, no species had been recorded from more than 100 separate PAs. A total of 61 species had records in five or fewer PAs (**Table 65**). The majority of species in this list had fewer than 100 individual record sites, and no species had more than 164 record sites. Sixty-five species of trap-door spider had records in five or fewer PAs greater than 1000 hectares (**Table 65**).

Table 65 Trap-door spider species recorded from five or fewer PAs and five or fewer PAs greater than 1000 ha.

Species	No. Records	No. reserves	No. Reserves >1000ha	EPBC status
**Aname* location 145	11	1	1	NL
Idiommata wa_flaretip	15	1	1	NL

Aganippe rhaphiduca sp grp	15	1	1 NL
**Aname* location 143	16	1	1 NL
Synothele michaelseni	16	1	1 NL
**Aname* location 142	19	1	1 NL
Hadronyche adelaidensis	23	1	1 NL
Misgolas robertsi	24	1	1 NL
Hadronyche le	33	1	1 NL
Arbanitis tasmanica	33	1	1 NL
Selenocosmia stirlingi	38	1	1 NL
Idiosoma sigillatum	164	1	1 NL
Idiosoma nigrum	23	2	1 NL
Aganippe subtristis	78	2	1 NL
Aname wa_geraldton_acute	11	2	2 NL
Australothele magna	11	2	2 NL
Aname wa_uwa	12	2	2 NL
Aname mainae?	14	2	2 NL
Aganippe nov	14	2	2 NL
Arbanitis annulipes	14	2	2 NL
Idiommata scintillans	33	2	2 NL
Selenocosmia sp.	42	2	2 NL
Hadronyche modesta	43	2	2 NL
Idiommata wa_goldenhair	45	2	2 NL
Misgolas hubbardi	49	2	2 NL
Stanwellia nebulosa	22	3	1 NL
Hadronyche venenata	135	3	1 NL
Missulena 6	33	3	2 NL
Misgolas melancholicus	52	3	2 NL
Misgolas dereki	61	3	2 NL
Aname nov	11	3	3 NL
Selenocosmia wacarina ms name	17	3	3 NL
Hadronyche meridiana	23	3	3 NL
Idiosoma hills	26	3	3 NL
Aname distincta	34	3	3 NL
Hadronyche mar	78	3	3 NL
Misgolas gracilis	81	4	1 NL
Australothele maculata	13	4	3 NL
Namea brisbanensis	20	4	3 NL
Ixamatus varius	11	4	4 NL
Eucyrtops wa_2_jarrahdale_latior	13	4	4 NL
Trittame gracilis	15	4	4 NL
Namea jimna	21	4	4 NL
Kwonkan wa_gelorup	22	4	4 NL
Hadronyche hu	26	4	4 NL
Selenocosmia crassipes	45	4	4 NL
Aname inimica	51	4	4 NL
Hadronyche wa	68	4	4 NL
Arbanitis longipes	39	5	1 NL
Cethegus fugax	18	5	2 NL

Aganippe rhaphiduca	34	5	3 NL
Namea bunya	11	5	4 NL
Misgolas 10	17	5	4 NL
Gaius villosus	125	5	4 NL
Mandjelia brassi	11	5	5 NL
Paraembolides grayi	12	5	5 NL
Misgolas mestoni	14	5	5 NL
Aname barrema	16	5	5 NL
Missulena dipsaca	45	5	5 NL
Missulena 0	46	5	5 NL
Hadronyche cerberea	67	5	5 NL
Teyl nov	12	6	5 NL
Blakistonia aurea	49	7	5 NL
Missulena insignis	75	10	2 NL
Misgolas andrewsi	33	11	4 NL

Huntsman Spiders (Sparassidae)

The ANHAT database has 1162 records for 116 species and subspecies of huntsman spiders. Eleven of these species account for approximately 50% of the total species records in ANHAT. Each of these species had over 20 records in the ANHAT database.

Table 66 Sparassidae species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% total records
Isopeda villosa	24	2.07
Isopeda magna	24	2.07
Holconia flindersi	25	2.15
Neosparassus diana	27	2.32
Isopedella saundersi	34	2.93
Isopedella inola	36	3.10
Holconia nigrigularis	45	3.87
Isopedella cerussata	68	5.85
Isopeda leishmanni	82	7.06
Isopedella leai	107	9.21
Delena cancerides	119	10.24
Total	591	50.87

The majority of species of huntsman spiders present in the ANHAT database have been rarely recorded, with 86 of the 116 species being represented by 10 or fewer individual record sites (**Table 67**). Again, such a large number of species leaves little opportunity to recognise trends in the database, especially as the habitat types of the majority are not easily identified. The very few records for most species leave it essentially impossible to state clearly what their habitat preferences are, even if there is any published information available to provide an indication. The limited information does not even allow broad regional distributions, with only state listings generally being available. This means that in most instances the distribution of a species is very difficult to assess with any confidence. However, some species with location data occur in more than one state, and the majority of species occur in eastern Australia. The lack of records for clearly often widespread species reflects the general lack of collecting and identification of the invertebrates within Australia. As is common for the invertebrates in general, no huntsman spider species have been assessed for listing under the EPBC Act.

Table 67 Huntsman spider species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
*Australosparsus a*3	1	0.00			100	NL
Beregama aurea	1	0.00	QLD, NSW	For	100	NL
Eodelena kosciuskoensis	1	100.00	NSW		100	NL
Eodelena tasmaniensis	1	100.00	TAS		100	NL
Heteropoda alta	1	0.00	QLD		100	NL
Heteropoda cervina	1	0.00	QLD		100	NL
Heteropoda crediton	1	0.00	QLD		100	NL
Heteropoda marillana	1	100.00	WA		100	NL
Heteropoda procera	1	100.00	QLD, NSW		100	NL
**Heteropoda* location 138	1	0.00	NSW		100	NL
Holconia 2	1	0.00			100	NL
Isopeda brachyseta	1	0.00	NSW		100	NL
Isopeda parnabyi	1	0.00	QLD, NSW		100	NL
Isopeda subalpina	1	100.00	VIC		100	NL
Isopeda vasta	1	0.00	QLD		100	NL
Isopedella 1	1	0.00			100	NL
Isopedella ambathala	1	100.00	QLD, SA		100	NL
Isopedella cerina	1	0.00	QLD		100	NL
Isopedella gibsandi	1	0.00	WA		100	NL
Isopedella maculosa	1	100.00	WA		100	NL
*Neosparassus a*8	1	0.00			100	NL
*Neosparassus a*9	1	0.00			200	NL
*Neosparassus n*16	1	0.00			100	NL
*Neosparassus n*26	1	0.00			100	NL
*Neosparassus n*3	1	100.00			100	NL
*Neosparassus n*31	1	100.00			100	NL
*Neosparassus n*32	1	0.00			100	NL
*Neosparassus n*44	1	100.00			100	NL
*Neosparassus n*54	1	0.00			100	NL
*Neosparassus n*55	1	100.00			100	NL
*Neosparassus n*6	1	0.00			100	NL
Pediana paradoxa	1	0.00	SA	Ar	100	NL
Typostola barbata	1	0.00	QLD		100	NL
Typostola pilbara	1	0.00	WA		100	NL
Heteropoda cf *cervina*	2	50.00			200	NL
Heteropoda venatoria	2	0.00	PANTROPICAL		200	NL
Isopeda canberrana	2	0.00	NSW, VIC		200	NL
Isopeda queenslandensis	2	0.00	QLD, NSW		200	NL
*Neosparassus n*25	2	0.00			200	NL

*Neosparassus n*27	2	0.00			200	NL
Neosparassus n4	2	50.00			200	NL
*Neosparassus n*40	2	0.00			200	NL
Neosparassus n47	2	100.00			300	NL
Neosparassus rutilus	2	50.00	QLD		400	NL
Pediana 1	2	0.00			200	NL
Pediana regina	2	0.00	WA, QLD, NSW		200	NL
Delena 2	3	66.67			200	NL
Delena 3	3	0.00			300	NL
Eodelena loftiensis	3	100.00			100	NL
Heteropoda longipes	3	0.00	NSW		200	NL
Holconia 1	3	0.00			300	NL
Holconia colberti	3	0.00	VIC		200	NL
Holconia hirsuta	3	0.00	QLD		300	NL
Isopeda echuca	3	33.33	NSW, VIC		300	NL
Neosparassus n30	3	0.00			300	NL
Neosparassus n35	3	66.67			200	NL
Neosparassus n49	3	0.00			400	NL
Neosparassus n7	3	33.33			300	NL
Neosparassus salacius	3	33.33	QLD, NSW		700	NL
Neosparassus a3	4	0.00			400	NL
Neosparassus n41	4	25.00			400	NL
Neosparassus n43	4	50.00			400	NL
Pediana temmei	4	0.00	SA	Ar	300	NL
Australosparsus punctatus	5	60.00			600	NL
Heteropoda binnaburra	5	20.00	QLD NSW		300	NL
Holconia westralia	5	0.00	WA		500	NL
Isopedella conspersa	5	0.00	QLD, NT		500	NL
Neosparassus n61	5	40.00			500	NL
Eodelena melanochelis	6	16.67	QLD		500	NL
Holconia immanis	6	0.00	AUST		700	NL
Isopedella flavida	6	0.00	QLD, NSW		700	NL
Pediana occidentalis	6	50.00	WA, SA		600	NL
Heteropoda renibulbis	7	42.86	WA, NT, QLD		800	NL
Neosparassus n22	7	71.43			700	NL
Neosparassus n39	7	14.29			600	NL
Neosparassus n46	7	28.57			700	NL
Neosparassus praecinctus	7	0.00			600	NL
Eodelena spenceri	8	0.00	TAS		800	NL
Heteropoda jugulans	8	0.00	QLD	For	700	NL
Holconia neglecta	8	37.50	WA, NT		900	NL
Neosparassus inframaculatus	8	25.00	SA		700	NL

Neosparassus n29	8	37.50		900	NL
Neosparassus patellatus	8	0.00	TAS	600	NL
Delena gloriosa	9	33.33	SA	800	NL
Isopedella frenchi	9	22.22	VIC, SA	800	NL
Neosparassus n28	10	50.00		600	NL

Removal of extinct and poorly recorded species leaves 889 records in ANHAT for 30 species (and subspecies). The mean number of records per species for species with greater than 10 records was 30, with a mean of 28% of records in the NRS. Only six species of huntsman spider had 45% or greater of individual site records located within PAs (**Table 68**) and only seven species were recorded with less than 10% of records located within PAs (**Table 69**).

Table 68 Huntsman spider species with >45% of site records within the NRS.

Species	No. Records	No. Records in NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Keilira sparsomaculata	13	6	46.15	SA		1200	NL
Isopedella cana	21	10	47.62	WA, SA		1800	NL
Isopedella saundersi	34	22	64.71	AUST		3100	NL
Isopeda magna	24	16	66.67	WA, SA		2000	NL
Holconia insignis	12	8	66.67	QLD, NSW		1000	NL
*Neosparassus n*59	12	11	91.67			1000	NL

Table 69 Huntsman spider species with <10% of ANHAT records located within The NRS

Species	No. Records	Inside NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Isopedella pessleri	11	0	0.00	NSW, VIC		700	NL
Isopedella tindalei	12	0	0.00	AUST		1100	NL
Isopedella victorialis	12	0	0.00	VIC		900	NL
Isopeda villosa	24	1	4.17	NSW		2000	NL
*Neosparassus n*51	22	1	4.55			1700	NL
Isopedella leai	107	8	7.48	SA		3000	NL
Holconia murrayensis	22	2	9.09	SA, VIC, NSW		2000	NL

The overall lack of records resulted in no species of huntsman spider being found to have records in more than 100 separate PAs. Thirteen species were found in five or fewer PAs and 14 in five or fewer PAs of greater than 1000 ha (Table 70).

Table 70 Huntsman spider species recorded from five or fewer PAs and recorded in five or fewer PAs of greater than 1000 hectares.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
*Neosparassus n*51	22	1	0	NL
Isopeda villosa	24	1	1	NL
Holconia murrayensis	22	2	2	NL
Heteropoda 1	16	3	3	NL
Pediana horni	17	3	3	NL
Isopeda woodwardi	16	4	1	NL
Neosparassus magareyi	11	4	3	NL
Neosparassus diana	27	4	3	NL
*Australosparsus a*4	19	4	4	NL
Holconia flindersi	25	4	4	NL
Neosparassus calligaster	12	5	5	NL
Pediana tenuis	18	5	5	NL
*Neosparassus a*4	20	5	5	NL
Neosparassus punctatus	16	6	5	NL
Isopeda montana	16	6	5	NL

Ground beetles (Carabidae)

The ANHAT database has 9569 records for 1203 species and subspecies of Carabidae. No species of Carabidae are considered extinct.

Eighty-eight species account for approximately 50% of the total species records in ANHAT. These species have over 20 records each, and, in the case of the *Pamborus alternans*, over 300 records (see **Table 68**).

Table 71 Terrestrial beetle species that account for approximately 50% of the total species records in ANHAT.

Species	No. Records	% Total Records
Amblytelus brevis	23	0.24
Catadromus lacordairei	23	0.24
Geoscaptus cacus	23	0.24
Trichosternus angulosus	23	0.24
Coptocarpus australis	23	0.24
Arthropterus westwoodii	23	0.24
Sphallomorpha suturalis	24	0.25
Philipis thompsoni	24	0.25
Demetrida vittata	24	0.25
Megacephala australis	25	0.26
Eurylychnus dyschirioides	25	0.26
Chlaenius darlingensis	25	0.26
Scaraphites rotundipennis	25	0.26
Rhytisternus miser	25	0.26
Notonomus flos	27	0.28
Carenum tinctilatum	27	0.28
Cratoferonia regalis	27	0.28
Notonomus marginatus	27	0.28
Adelotopus dytiscides	27	0.28
Platycoelus prolixus	27	0.28
Mecyclothorax lewisensis	29	0.30
Notonomus politulus	29	0.30
Agonocheila perplexa	29	0.30
Zeodera atra	30	0.31
Notonomus transitus	30	0.31
Laccopterum deauratum	31	0.32
Carenum bonellii	32	0.33
Chlaenius flaviguttatus	32	0.33
Loxogenius opacipennis	33	0.34
Trichosternus frater	33	0.34
Notagonum submetallicum	33	0.34
Trichosternus nudipes	33	0.34
Leiradira opacistriatis	34	0.36
Carenum interruptum	36	0.38
Philoscaphus tuberculatus	36	0.38
Cratogaster melas	37	0.39

Trigonothops flavofasciata	37	0.39
Eurylychnus blagravei	38	0.40
Notonomus montorum	38	0.40
Notonomus variicollis	39	0.41
Nurus latipennis	39	0.41
Notonomus rainbowi	40	0.42
Pamborus brisbanensis	40	0.42
Agonocheila curtula	40	0.42
Leiradira alternans	41	0.43
Castelnaudia setosiceps	41	0.43
Notonomus masculinus	41	0.43
Chlaenius australis	42	0.44
Amblytelus curtus	44	0.46
Castelnaudia septemcostata	44	0.46
Pamborus transitus	45	0.47
Trichosternus perater	45	0.47
Pamborus pradieri	46	0.48
Leiradira auricollis	46	0.48
Castelnaudia speciosa	46	0.48
Notonomus resplendens	47	0.49
Lecanomerus niger	48	0.50
Geoscaptus laevissimus	48	0.50
Notonomus doddi	49	0.51
Demetrida grandis	50	0.52
Castelnaudia wilsoni	51	0.53
Sarticus cyaneocinctus	51	0.53
Cicindela semicincta	53	0.55
Trichosternus subvirens	53	0.55
Notolestus sulcipennis	54	0.56
Trichosternus renardi	59	0.62
Notonomus spurgeoni	61	0.64
Gnathaphanus pulcher	63	0.66
Notonomus angustibasis	64	0.67
Pheropsophus verticalis	65	0.68
Pamborus macleayi	68	0.71
Setalis niger	70	0.73
Helluo costatus	72	0.75
Sitaphe rotundata	74	0.77
Castelnaudia cordata	79	0.83
Pamborus viridis	84	0.88
Calosoma schayeri	86	0.90
Castelnaudia marginifera	87	0.91
Mystropomus regularis	88	0.92
Pamborus opacus	98	1.02
Carenum brisbanense	106	1.11
Pamborus tropicus	121	1.26
Castelnaudia obscuripennis	125	1.31
Cratoferonia phylarchus	125	1.31
Mystropomus subcostatus	148	1.55
Trichosternus vigorsi	194	2.03

Pamborus guerinii	210	2.19
Pamborus alternans	325	3.40
Total	4782	49.93

Nine hundred and ninety-nine ground beetles had 10 or fewer individual site records in the ANHAT database (**Table 72**). No species are listed as threatened. Most of these species have no location information. Of those that do, 74 percent are found in eastern Australia. These species have been excluded from analysis but are included here for reference. Exclusion of these poorly recorded species eliminates 1780 records.

Table 72. Carabidae species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Adelotopus nemosomoides	1	100.0			100	NL
Agonocheila bimaculata	1	100.0			100	NL
Agonocheila subfasciata	1	100.0	SA	Euc	200	NL
Agonocheila vittula	1	100.0	SA, VIC	Euc	100	NL
Anomotarus nq2	1	100.0			100	NL
Austrotrechus kosciuskoanus	1	100.0			100	NL
Carenum episcopale	1	100.0			100	NL
Carenum morosum	1	100.0			100	NL
Carenum planipenne	1	100.0			100	NL
Carenum pusillum	1	100.0			100	NL
Cicindela cardinalba	1	100.0	SA	Rip	100	NL
Cicindela darwini	1	100.0			200	NL
Clivina lobipes	1	100.0			100	NL
Clivina monilicornis	1	100.0			100	NL
Clivina nyctosyloides	1	100.0			100	NL
Colasidia monteithi	1	100.0	QLD	For	100	NL
Conopterum chaudoirii	1	100.0			100	NL
Demetrida setosa	1	100.0	TAS	Euc	100	NL
Dicrochile punctulata	1	100.0			100	NL
Distipsidera papuana	1	100.0			200	NL
Eurylychnus femoralis	1	100.0	TAS	For	100	NL
Eurylychnus kershawi	1	100.0			100	NL
Euryscaphus angulatus	1	100.0			100	NL
Eutrechopsis ovalis	1	100.0			100	NL
Gnathaphanus multipunctatus	1	100.0			100	NL
Hormacrus latus	1	100.0			100	NL
Lacordairia cq1	1	100.0			100	NL
Mimotrechus obscuroguttatus	1	100.0			100	NL
Mimotrechus scitulus	1	100.0			100	NL
Monocentrum megacephalum	1	100.0			100	NL
Mystropomus regularis laevis	1	100.0			100	NL
Notonomus 2	1	100.0			100	NL
Notonomus bakewelli	1	100.0	SE	For	100	NL

*Notonomus cbcr*3 6	1	100.0			100	NL
Notonomus dehiscens	1	100.0	SE	For	100	NL
Notonomus prominens	1	100.0	E		100	NL
Percodermus niger	1	100.0	TAS	For	100	NL
Percolestus blackburni	1	100.0	SE	Al	100	NL
Philipis heatherae	1	100.0	QLD	For	100	NL
Philipis minor	1	100.0	QLD	For	100	NL
Philipis nq1	1	100.0			100	NL
Philipis nq2	1	100.0			100	NL
Philipis perstriata	1	100.0	QLD	For	100	NL
Philipis picea	1	100.0	QLD	For	100	NL
Philipis reticulata	1	100.0	QLD	For	100	NL
Philipis spurgeoni	1	100.0	QLD	For	100	NL
Philipis vicina	1	100.0	QLD	For	100	NL
Promecoderus pacificus	1	100.0			100	NL
Promecoderus plebius	1	100.0			100	NL
Promecoderus tasmanicus	1	100.0	SE,TAS	For	200	NL
Pseudaptinus fulvus	1	100.0	NSW,QLD,SA,VIC	Wet	100	NL
Pterocyrtus cavicola	1	100.0	TAS	Cave	100	NL
Pterocyrtus rubescens	1	100.0			100	NL
Sarothrocrepis setulosa	1	100.0	NSW	Euc	100	NL
Scopodes simplex	1	100.0			100	NL
Tasmanitachoides hobarti	1	100.0	TAS	Rip	100	NL
Tasmanitachoides wattsense	1	100.0			100	NL
Tasmanorites nitens	1	100.0	TAS	Al,Lit	100	NL
Tasmanorites tasmaniae	1	100.0	TAS	Lit	200	NL
Tasmanotrechus elongatus	1	100.0	TAS	Cave	100	NL
Teraphis crenulata	1	100.0			100	NL
Tricondyla aptera	1	100.0	QLD	For	100	NL
Abacetus ater	1	0.0			100	NL
Abacetus haemorrhous	1	0.0			100	NL
Acupalpus tachioides	1	0.0			100	NL
Adelotopus affinis	1	0.0			100	NL
Adelotopus analis	1	0.0			100	NL
Adelotopus bimaculatus angustior	1	0.0			100	NL
Adelotopus dubius glaber	1	0.0		Euc	100	NL
Adelotopus laticollis	1	0.0			100	NL
Adelotopus linearis	1	0.0	NT, QLD, WA	Euc	100	NL
Adelotopus maculipennis	1	0.0	QLD	Euc	100	NL
Adelotopus minor	1	0.0			100	NL
Adelotopus similis	1	0.0	ACT, NSW, VIC	Euc	100	NL
Adelotopus ulrichi	1	0.0			200	NL
Adotela carenoides	1	0.0			100	NL
Adotela esmeralda	1	0.0			100	NL
Adotela frenchi	1	0.0			100	NL
Adotela viridis	1	0.0			100	NL

Agonocheila fasciata	1	0.0			200	NL
Agonocheila ovalis	1	0.0			100	NL
Agonocheila stictica	1	0.0			100	NL
Amblystomus gagatinus	1	0.0			100	NL
Amblystomus laetus	1	0.0			100	NL
Amblystomus montanus	1	0.0			100	NL
Amblystomus parvus	1	0.0			100	NL
Amblytelus bicolor	1	0.0			100	NL
Amblytelus minutus	1	0.0			100	NL
Amblytelus sinuatus	1	0.0			100	NL
Amblytelus sloanei	1	0.0			100	NL
Anatrichis pusilla	1	0.0			100	NL
Anatrichis sexstriata	1	0.0			100	NL
*Anomotarus ambs*1	1	0.0			100	NL
Anomotarus crassiceps	1	0.0			100	NL
Arthropterus articularis	1	0.0			100	NL
Arthropterus foveicollis	1	0.0			100	NL
Arthropterus foveipennis	1	0.0			100	NL
Arthropterus humeralis	1	0.0			100	NL
Arthropterus kingii	1	0.0			100	NL
Arthropterus macleayi	1	0.0			100	NL
Arthropterus melbournei	1	0.0			100	NL
Arthropterus punctatissimus	1	0.0			100	NL
Bembidion blackburni	1	0.0	NSW, SA, TAS, VIC	He	200	NL
Bembidion brullei	1	0.0	ACT, NSW, SA, VIC	Rip	100	NL
Bembidion mastersi	1	0.0			100	NL
Bothynotrechus castelnaui	1	0.0	VIC		100	NL
Cainogenion tropicum	1	0.0			100	NL
Carenum 2	1	0.0			100	NL
*Carenum ambs*1 2	1	0.0			100	NL
Carenum angustipenne	1	0.0			100	NL
Carenum batesi	1	0.0			100	NL
Carenum browni	1	0.0			100	NL
Carenum carbonarium	1	0.0			100	NL
Carenum coruscum	1	0.0			100	NL
Carenum cupripenne	1	0.0			100	NL
Carenum digglesi	1	0.0			100	NL
Carenum distinctum	1	0.0			100	NL
Carenum ducale	1	0.0			100	NL
Carenum felix	1	0.0			100	NL
Carenum formosum	1	0.0			100	NL
Carenum frenchi	1	0.0			100	NL
Carenum froggatti	1	0.0			100	NL
Carenum habitans	1	0.0			100	NL
Carenum ineditum	1	0.0			100	NL
Carenum iridescens	1	0.0			100	NL
Carenum kingii	1	0.0			100	NL
Carenum laterale	1	0.0	NSW		100	NL

Carenum lepidum	1	0.0			100	NL
Carenum macleayi	1	0.0			100	NL
Carenum odewahnii	1	0.0			100	NL
Carenum perplexum	1	0.0			100	NL
Carenum puncticolle	1	0.0			100	NL
Carenum smaragdulum	1	0.0			200	NL
Carenum submetallicum	1	0.0			100	NL
Carenum tibiale	1	0.0			100	NL
Catascopus chalydicus	1	0.0			100	NL
*Cenogmus ambs*1 2	1	0.0			100	NL
Cenogmus opacipennis	1	0.0	SA		100	NL
Cerotalis versicolor	1	0.0	VIC		100	NL
Chlaenius subcostatus	1	0.0			100	NL
Cicindela blackburni	1	0.0			100	NL
Cicindela frenchi	1	0.0			200	NL
Cicindela gilesi	1	0.0			100	NL
Cicindela salicursoria	1	0.0	WA	Rip	100	NL
Cicindela tetragramma	1	0.0			100	NL
Cicindela upsilon	1	0.0			200	NL
Clivina atridorsis	1	0.0			100	NL
Clivina brevisterna	1	0.0			200	NL
Clivina carpentaria	1	0.0	NT, QLD	Rip	100	NL
Clivina cava	1	0.0			100	NL
Clivina coronata	1	0.0			100	NL
Clivina debilis	1	0.0			100	NL
Clivina dimidiata	1	0.0			100	NL
Clivina frenchi	1	0.0			100	NL
Clivina gracilipes	1	0.0			100	NL
Clivina leai	1	0.0			200	NL
Clivina obliquata	1	0.0			100	NL
Clivina odontomera	1	0.0			100	NL
Clivina pallidiceps	1	0.0			100	NL
Clivina planifrons	1	0.0			100	NL
Clivina sellata	1	0.0	ACT, NSW, QLD, VIC, WA	Rip	200	NL
Clivina simulans	1	0.0			100	NL
Clivina tuberculifrons	1	0.0			100	NL
Clivina vagans	1	0.0			200	NL
Conopterum damelii	1	0.0			100	NL
Conopterum gagatinum	1	0.0			100	NL
Conopterum sapphirinum	1	0.0			100	NL
Cosmodiscus rubripictus	1	0.0			100	NL
Craspedophorus angusticeps	1	0.0	QLD	SL	100	NL
Craspedophorus comptus	1	0.0			100	NL
Craspedophorus elongatus	1	0.0			100	NL
*Cratogaster cq*1	1	0.0			100	NL
Cratogaster robusta	1	0.0			100	NL
Darodilia liopleura	1	0.0			100	NL
Darodilia ovicollis	1	0.0			100	NL

Demetrida angusticollis	1	0.0			100	NL
Demetrida doddi	1	0.0			100	NL
Demetrida fasciata	1	0.0			100	NL
Demetrida opicalis	1	0.0			100	NL
Dicraspeda brunneipennis	1	0.0			100	NL
Distipsidera mastersii	1	0.0			200	NL
Egadroma suturalis	1	0.0	QLD, WA		100	NL
Elaphropus nervosus	1	0.0			100	NL
Elaphropus ovensensis	1	0.0			100	NL
Epilectus mastersi	1	0.0			100	NL
Epimicodema mastersii	1	0.0			100	NL
Euryscaphus obesus ebeninus	1	0.0			100	NL
Euryscaphus obesus obesus	1	0.0			100	NL
Euryscaphus obesus sulcicollis	1	0.0	SA	HG, WL, SL, GrL, Ar, Sc	100	NL
Euthenarus morganensis	1	0.0			100	NL
Euthenarus promptus	1	0.0			200	NL
Eutrechus coxi	1	0.0			100	NL
Eutrechus otwayensis	1	0.0			100	NL
*Feronista cq*1	1	0.0			100	NL
*Geoscaptus ambs*1 1	1	0.0			100	NL
Gigadema dux	1	0.0			100	NL
Gigadema mandibulare	1	0.0			100	NL
Gigadema rugaticolle	1	0.0			100	NL
Gnathaphanus herbaceus	1	0.0			100	NL
Gnathoxys cicatricosus	1	0.0			200	NL
Gnathoxys crassipes	1	0.0			100	NL
Gnathoxys foveatus	1	0.0			100	NL
Gnathoxys tesselatus	1	0.0			100	NL
Helluarchus robustus	1	0.0			100	NL
Holcoderus caeruleipennis	1	0.0			100	NL
Hololeius ceylanicus	1	0.0			100	NL
Homethes rotundatus	1	0.0			100	NL
Homethes velutinus	1	0.0			100	NL
Hypharpax aereus	1	0.0			100	NL
Hypharpax convexiusculus	1	0.0			100	NL
Hypharpax flindersii	1	0.0			100	NL
Hypharpax kingii	1	0.0			100	NL
Hypharpax moestus	1	0.0			100	NL
Hypharpax obsoletus	1	0.0			100	NL
Hypharpax puncticollis	1	0.0	NE		100	NL
Hypharpax sloanei	1	0.0			100	NL
Laccocenus ambiguus	1	0.0	SE		100	NL
Laccopterum doddi	1	0.0			100	NL
Laccopterum foveipenne	1	0.0			100	NL
Laccopterum foveolatum	1	0.0			100	NL
Laccopterum humerale	1	0.0			100	NL

Laccopterum quadriseriatum	1	0.0			100	NL
Lacordairia anchomenoides	1	0.0			100	NL
*Lacordairia cbcr*3	1	0.0			100	NL
Lebia bicolor	1	0.0			100	NL
Lebia melanonota	1	0.0			100	NL
Lecanomerus concolor	1	0.0			100	NL
Lecanomerus ruficeps	1	0.0			100	NL
Leiradira latreillei	1	0.0			100	NL
Leiradira puella	1	0.0			100	NL
Lesticus chloronotus	1	0.0			200	NL
Loxandrus amplicollis	1	0.0			100	NL
Loxandrus subgagatinus	1	0.0			100	NL
Loxandrus subiridescens	1	0.0			100	NL
*Mecyclothorax ambs*1 1	1	0.0			100	NL
Mecynognathus damelii	1	0.0			100	NL
Megacephala hopei	1	0.0			100	NL
Megacephala howittii	1	0.0			100	NL
Megacephala intermedia	1	0.0			200	NL
Megacephala marginicollis	1	0.0			100	NL
Megacephala murchisona	1	0.0			100	NL
Megacephala scapularis	1	0.0			100	NL
Megacephala spenceri	1	0.0			100	NL
Microferonia adelaidae	1	0.0			100	NL
Microferonia anchomenoides	1	0.0			100	NL
Microferonia cinctipennis	1	0.0			100	NL
Mimotrechus carteri	1	0.0			100	NL
Monocentrum convexum	1	0.0			100	NL
Monocentrum laticeps	1	0.0			100	NL
Monocentrum longiceps	1	0.0			100	NL
Morion crassipes	1	0.0			100	NL
Morion longipennis	1	0.0			100	NL
Neocarenum retusum	1	0.0			100	NL
Neoscaphus simplex	1	0.0			100	NL
Nickerlea sloanei	1	0.0			100	NL
Notagonum dentellum	1	0.0	NE		100	NL
Notiobia planiuscula	1	0.0			100	NL
Notiobia planoimpressa	1	0.0			100	NL
Notiobia quadricollis	1	0.0			100	NL
Notonomus curvicollis	1	0.0	SE	Al	100	NL
Notonomus dives	1	0.0			100	NL
Notonomus metallicus	1	0.0			100	NL
Notonomus spenceri	1	0.0			100	NL
Notonomus subiridescens	1	0.0			100	NL
Notonomus tenuistriatus	1	0.0			100	NL
Notonomus tessellatus	1	0.0	E	For	100	NL
Notonomus tillyardi	1	0.0			100	NL
Notonomus wentworthi	1	0.0			100	NL
Notospeophonus pallidus	1	0.0	SW	Cave	100	NL
*Nurus cq*1	1	0.0			100	NL
Oodes denisonensis	1	0.0			100	NL

Oodes froggatti	1	0.0	CN		200	NL
Parroa grandis	1	0.0			100	NL
Pediomorphus planiusculus	1	0.0			200	NL
Pentagonica ruficollis	1	0.0			100	NL
Pericompsus olliffi	1	0.0			100	NL
Pericompsus semistriatus	1	0.0			100	NL
Pericompsus yarrensis	1	0.0			100	NL
Perigona nigriceps	1	0.0			100	NL
Perileptus minimus	1	0.0			100	NL
Philophloeus brunnipennis	1	0.0			100	NL
*Philophloeus cbcr*3 1	1	0.0			100	NL
*Philophloeus cbcr*3 2	1	0.0			100	NL
Philophloeus confertus	1	0.0			100	NL
Philophloeus maculatus	1	0.0			100	NL
Philophloeus myrmecophilus	1	0.0			100	NL
Philophloeus obtusus	1	0.0			100	NL
Philophloeus opaciceps	1	0.0			100	NL
Philophloeus ornatus	1	0.0	SE,SW	Euc	100	NL
Philophloeus rectangulus	1	0.0	SE	Euc	100	NL
Philophloeus vittatus	1	0.0			100	NL
Philoscaphus barnardi	1	0.0			100	NL
Phorticosomus grandis	1	0.0			100	NL
Phorticosomus macleayi	1	0.0			100	NL
Phorticosomus mucronatus	1	0.0			100	NL
Phorticosomus piceus	1	0.0			100	NL
Phorticosomus randalli	1	0.0			100	NL
Platycoelus interstitialis	1	0.0			100	NL
Pogonoglossus inflaticeps	1	0.0			100	NL
Pogonoschema robustum	1	0.0	TAS	Lit	100	NL
Pogonoschema sloanei	1	0.0			100	NL
Pogonus hypharpagioides	1	0.0	SA,VIC	SaL	100	NL
Pogonus variabilis	1	0.0			100	NL
Porocara punctata arnhemensis	1	0.0			100	NL
Promecoderus albaniensis	1	0.0			100	NL
Promecoderus anguliceps	1	0.0			100	NL
Promecoderus bassii	1	0.0			100	NL
Promecoderus cordicollis	1	0.0	TAS		200	NL
Promecoderus hunteriensis	1	0.0			100	NL
Promecoderus insignis	1	0.0			100	NL
Promecoderus mastersii	1	0.0			100	NL
Promecoderus neglectus	1	0.0			100	NL
Promecoderus pygmaeus	1	0.0			100	NL
Promecoderus subdepressus	1	0.0			100	NL
Prosopogmus foveipennis	1	0.0			100	NL
Prosopogmus punctifer	1	0.0	TAS	For	200	NL
Prosopogmus suspectus	1	0.0			200	NL
Pseudagonica nitida	1	0.0			100	NL
Pseudomorpha insignis	1	0.0	NSW,VIC		100	NL
Rhaebolestes walkeri	1	0.0			100	NL

*Rhytisternus ambs*1 1	1	0.0			100	NL
Rhytisternus cardwellensis	1	0.0			100	NL
Rhytisternus mastersii	1	0.0			100	NL
Rhytisternus nigellus	1	0.0			100	NL
Rhytisternus solidus	1	0.0	QLD		100	NL
*Sarothrocrepis cbcr*3 1	1	0.0			100	NL
Sarothrocrepis humerata	1	0.0			100	NL
Sarothrocrepis inquinata	1	0.0			100	NL
Sarothrocrepis parvicollis	1	0.0			200	NL
Sarticus macleayi	1	0.0			100	NL
Sarticus obscurus	1	0.0			100	NL
Scaraphites humeralis	1	0.0			100	NL
Scaraphites lenaeus pacificus	1	0.0			100	NL
*Scopodes ambs*1 1	1	0.0			100	NL
Scopodes griffithi	1	0.0			100	NL
Scopodes laevis	1	0.0			100	NL
Setodyschirius wilsoni	1	0.0			100	NL
Setodyschirius zonatus	1	0.0			100	NL
Siagonyx 1	1	0.0			100	NL
Speotarus lucifugus	1	0.0	NSW, SA, WA		100	NL
Sphallomorpha amabilis	1	0.0	NT, QLD, WA		100	NL
*Sphallomorpha ambs*1	1	0.0			100	NL
Sphallomorpha atrata	1	0.0			100	NL
Sphallomorpha bicolor	1	0.0	NSW, QLD	Euc	100	NL
Sphallomorpha biplagiata	1	0.0			100	NL
Sphallomorpha boops	1	0.0			100	NL
Sphallomorpha carnavona	1	0.0			100	NL
Sphallomorpha eungellae	1	0.0			100	NL
Sphallomorpha incerta	1	0.0			100	NL
Sphallomorpha laevigata	1	0.0			100	NL
Sphallomorpha longiplagiata	1	0.0			100	NL
Sphallomorpha marginata	1	0.0			100	NL
Sphallomorpha metallica	1	0.0			100	NL
Sphallomorpha minor	1	0.0			100	NL
Sphallomorpha multiseta	1	0.0			100	NL
Sphallomorpha picta	1	0.0	NSW, QLD	Euc	100	NL
Sphallomorpha rockhamptonensis	1	0.0			100	NL
Sphallomorpha speciosa	1	0.0			100	NL
Sphallomorpha striata	1	0.0			100	NL
Sphallomorpha striatopunctata	1	0.0			100	NL
Sphallomorpha torresia	1	0.0			100	NL
Sphallomorpha tropicalis	1	0.0			100	NL
Tachys ectromioides	1	0.0			100	NL
Tachys impressipennis	1	0.0			200	NL
Tachys infuscatus	1	0.0			100	NL
Tachys lividus	1	0.0			100	NL

Tachys mastersi	1	0.0			100	NL
Tachys mitchelli	1	0.0			100	NL
Tachys queenslandicus	1	0.0			100	NL
Tachyta brunnipennis	1	0.0			100	NL
Tasmanitachoides murrumbidgensis	1	0.0			300	NL
Tasmanitachoides obliquiceps	1	0.0			100	NL
Teraphis helmsi	1	0.0			100	NL
Trechobembix baldiensis queenslandica	1	0.0	QLD	Rip	100	NL
Trichocarenum castelnaui	1	0.0			100	NL
Trigonothops humeralis	1	0.0	WA	Euc	100	NL
Trigonothops mastersii	1	0.0			100	NL
Tropidotrechus victoriae	1	0.0	VIC	Lit	100	NL
Zuphium castelnaui	1	0.0			100	NL
Zuphium pindan	1	0.0			100	NL
Zuphium thouzeti	1	0.0			100	NL
Adelotopus apicalis	2	50.0			200	NL
Adelotopus murrayanus	2	100.0			200	NL
Agonocheila mollis	2	50.0			200	NL
Agonocheila sublaevis	2	50.0	NSW	Euc	200	NL
Carenum laevipenne	2	50.0			200	NL
Carenum punctipenne	2	50.0			100	NL
Carenum purpureum	2	50.0			200	NL
Castelnaudia kirrama	2	100.0	QLD	For	100	NL
Clivina dingo	2	50.0	QLD	Rip	200	NL
Conopterum tropicale	2	50.0	QLD		200	NL
Demetrida loweri	2	50.0			200	NL
Demetrida parallela	2	50.0			200	NL
Demetrida quadricollis	2	50.0			200	NL
Dicrochile gigas	2	50.0			200	NL
Dilonchus pictus	2	50.0			200	NL
Distipsidera eungellae	2	50.0	QLD	For	200	NL
Distipsidera hackeri	2	50.0			200	NL
Eurylychnus victoriae	2	50.0			200	NL
Gnathoxys humeralis	2	100.0	CS		200	NL
Haplaner velox	2	50.0	SE		200	NL
Leiradira nq1	2	100.0			100	NL
Loxoncus marginatus	2	50.0			200	NL
Mecyclothorax punctatus	2	50.0	E,SE		200	NL
Notagonum macleayi	2	100.0	NE		200	NL
Notonomus apicalis	2	50.0			200	NL
*Notonomus cbcr*3 3	2	100.0			200	NL
*Notonomus cbcr*3 5	2	50.0			200	NL
Notonomus fergusoni	2	50.0			200	NL
Notonomus hedleyi	2	50.0			200	NL
Notonomus kosciuskianus	2	100.0			200	NL
Notonomus lateralis	2	50.0			100	NL
Notonomus minimus	2	50.0			200	NL
Notonomus muelleri	2	100.0			200	NL

Parophonus opacus	2	50.0			100	NL
Paussotropus cylindricum	2	50.0	SE		200	NL
Philipis alticola	2	100.0	QLD	For	200	NL
Philipis geoffreyi	2	100.0	QLD	For	100	NL
Philipis inermis	2	100.0	QLD	For	100	NL
Philipis laevigata	2	100.0	QLD	For	200	NL
Philipis laevis	2	100.0	QLD	For	100	NL
Philipis quadraticollis	2	100.0	QLD		200	NL
Philipis striata	2	50.0	QLD	For	200	NL
Plagiotelum opalescens	2	50.0			200	NL
Rhytisternus callabonnensis	2	100.0	SA		200	NL
Sarothrocrepis posticalis	2	50.0			200	NL
Sarticus cooki	2	100.0			200	NL
Simodontus clermonti	2	100.0	TAS, VIC		200	NL
Simodontus rotundipennnis	2	50.0			200	NL
Teropha sturtii	2	50.0			200	NL
Theprisa australis	2	50.0	VIC		200	NL
Trichosternus nq1	2	100.0	NE?		200	NL
Trigonothops parviceps	2	50.0	NSW	Euc	200	NL
Zuphium australe	2	50.0	NSW, NT, QLD, SA, VIC, WA		200	NL
Abacetus angustior	2	0.0			200	NL
Adelotopus fasciatus	2	0.0			200	NL
Adelotopus puncticollis	2	0.0			200	NL
Adelotopus seriepunctatus	2	0.0	VIC		200	NL
Adotela concolor	2	0.0			200	NL
Agonocheila guttata	2	0.0	VIC	Euc	200	NL
Amblystomus quadriguttatus	2	0.0			200	NL
Amblytelus leai	2	0.0			200	NL
Anomotarus caerulescens	2	0.0			200	NL
*Apotomus ambs*1	2	0.0			200	NL
Arthropterus angulicornis	2	0.0			200	NL
Arthropterus hirtus	2	0.0			200	NL
Arthropterus howittii	2	0.0			200	NL
Bembidion errans	2	0.0	SA, TAS, VIC, WA	estuarine	300	NL
*Cainogenion ambs*1 1	2	0.0			200	NL
Carenum acutipes	2	0.0			200	NL
*Carenum ambs*1	2	0.0			200	NL
Carenum concinnum	2	0.0			200	NL
Carenum coracinum	2	0.0			300	NL
Carenum imitator	2	0.0			200	NL
Carenum speciosum	2	0.0			200	NL
Carenum striatopunctatum	2	0.0			200	NL
Carenum subcyaneum	2	0.0			200	NL
Carenum venustum	2	0.0			200	NL
Carenum virescens	2	0.0			200	NL
*Cenogmus ambs*1 1	2	0.0			200	NL
Cicindela albolineata	2	0.0	NT, QLD,	Rip	200	NL

			WA			
Cicindela aurita	2	0.0			200	NL
Cicindela browni	2	0.0			200	NL
Clivina boops	2	0.0			200	NL
Clivina bovillae	2	0.0			200	NL
Clivina obliquicollis	2	0.0			200	NL
Clivina oodnadattae	2	0.0			200	NL
Clivina pectoralis	2	0.0			200	NL
Clivina robusta	2	0.0			200	NL
Colpodes truncatellus	2	0.0			200	NL
Conopterum atrum	2	0.0			200	NL
Conopterum mucronatum	2	0.0			200	NL
Conopterum pyripenne	2	0.0			200	NL
Conopterum spaldingii	2	0.0	NT		200	NL
Coptoglossus carteri	2	0.0			200	NL
Darodilia curta	2	0.0	QLD	For	200	NL
Demetrida cylindricollis	2	0.0			200	NL
Demetrida marginipennis	2	0.0			200	NL
Demetrida nigricincta	2	0.0			200	NL
Demetrida tweedensis	2	0.0			200	NL
Dicrochile brevicollis	2	0.0			200	NL
Distipsidera flavicans	2	0.0			200	NL
Drypta mastersii	2	0.0			200	NL
Elaphropus flavicornis	2	0.0			200	NL
Eudalia castelnaui	2	0.0			200	NL
Euthenarus comes	2	0.0			200	NL
Geoscaptus crassus	2	0.0	QLD		300	NL
Gnathaphanus latus	2	0.0			200	NL
Gnathaphanus licinoides	2	0.0			200	NL
Gnathoxys granularis	2	0.0			300	NL
Helluapterus niger	2	0.0			300	NL
Hypharpax interioris	2	0.0			200	NL
Hypharpax ranula	2	0.0			200	NL
Laccopterum salebrosum	2	0.0			200	NL
Lacordairia argutoroides	2	0.0			200	NL
Lecanomerus atriceps	2	0.0			200	NL
Lecanomerus bicolor	2	0.0			100	NL
Lecanomerus major	2	0.0			200	NL
Lecanomerus speluncarius	2	0.0	CS	Cave	100	NL
Lecanomerus victoriensis	2	0.0			200	NL
Loxandrus australicus	2	0.0			200	NL
Loxandrus longiformis	2	0.0	W,CN,E,SE		200	NL
Lymnastis pilosus	2	0.0			200	NL
Mecyclothorax lateralis	2	0.0	SE,CS		200	NL
Megacephala castelnaui	2	0.0	SW	SaL	200	NL
Megacephala helmsi	2	0.0			200	NL
Megalopaussus amplipennis	2	0.0			200	NL
Microferonia marginata	2	0.0			300	NL
Microlestodes australiensis	2	0.0			200	NL
Microlestodes yarrae	2	0.0			200	NL

Moriodema mcoyei	2	0.0			200	NL
Morion novae*hollandiae*	2	0.0			200	NL
Mystropomus subcostatus chaudoiri	2	0.0			200	NL
Neocarenum spenceri	2	0.0			200	NL
Notiobia sculptipennis	2	0.0			200	NL
Notonomus aeques	2	0.0			200	NL
Notonomus atrodermis atrodermis	2	0.0	E,SE	For	200	NL
Notonomus atrodermis smithi	2	0.0	SE	For	200	NL
Notonomus gravis	2	0.0			200	NL
Notonomus lesueurii	2	0.0			200	NL
Notonomus polli	2	0.0	E	For	100	NL
Oodes fitzroyensis	2	0.0			200	NL
Parazuphium mastersii	2	0.0	SE	Wet	200	NL
Parroa noctis	2	0.0			200	NL
Pericompsus punctipennis	2	0.0	E		200	NL
Perigona dorsata	2	0.0			200	NL
*Pheropsophus ambs*1 1	2	0.0			200	NL
Philoscaphus carinatus	2	0.0			200	NL
Physoloesthus suturalis	2	0.0	E,SE		200	NL
Pogonus cardiotrachelus	2	0.0	SE,I,W	SaL	300	NL
*Promecoderus ambs*1	2	0.0			100	NL
Promecoderus blackburni	2	0.0			200	NL
Promecoderus nigellus	2	0.0			200	NL
Prosopogmus boisduvalii	2	0.0			200	NL
Prosopogmus harpaloides	2	0.0			200	NL
Rhysopleura orbicollis	2	0.0			200	NL
Sarothrocrepis gravis	2	0.0			200	NL
*Sarticus ambs*1 1	2	0.0			200	NL
Sarticus ischnus	2	0.0			200	NL
Scaraphites laticollis gigas	2	0.0			200	NL
Scopodes aterrimus	2	0.0	NSW, TAS, WA		400	NL
*Simodontus ambs*1 1	2	0.0	QLD?		100	NL
Simodontus convexus	2	0.0			200	NL
Sphallomorpha difficilis	2	0.0			200	NL
Sphallomorpha flavicollis	2	0.0	NT, QLD, WA	WL	200	NL
Sphallomorpha thouzeti	2	0.0			200	NL
Sphallomorpha uniformis	2	0.0			200	NL
Stichonotus leai	2	0.0	TAS	For	200	NL
Tachys uniformis	2	0.0			200	NL
Tasmanotrechus leai	2	0.0	TAS	Lit,Cave	400	NL
Trechodes secalioides	2	0.0	NSW, VIC	Rip	200	NL
Trichocarenum cylindricum	2	0.0			200	NL
Trichosternus relictus	2	0.0	WA	For	100	NL
Trigonothops australis	2	0.0	TAS, VIC	Euc	200	NL
Trigonothops pauper	2	0.0			200	NL

Violagonum violaceum	2	0.0	QLD	For	200	NL
Adelotopus vicinus	3	100.0			300	NL
Agonocheila punctulata	3	33.3			300	NL
Arthropterus waterhousei	3	33.3			300	NL
Bembidion albovirens	3	33.3			300	NL
Carenum dispar	3	33.3			300	NL
Cicindela ioscelis	3	33.3			200	NL
Cicindela nigrina	3	33.3			300	NL
Clarencia quadridens	3	33.3	QLD	Wet	300	NL
Clivina obscuripes	3	33.3			300	NL
Clivina queenslandica	3	33.3			300	NL
Conopterum superbum	3	66.7			300	NL
Cratogaster unicolor	3	33.3			300	NL
Delinius essingtoni	3	66.7			300	NL
Demetrida elongata	3	33.3			300	NL
Demetrida infuscata	3	33.3	TAS	Euc	300	NL
Dicrochile minuta	3	33.3			300	NL
Dicrochile quadricollis	3	33.3	NSW, TAS, VIC		300	NL
Distipsidera sericea	3	33.3	QLD	For	300	NL
Eurylychnus ovipennis	3	66.7	NSW	For	300	NL
Euryscaphus waterhousei	3	33.3	NT, WA	HG, WL, SL, GrL, Ar, Sc	300	NL
Helluosoma atrum	3	33.3			300	NL
Hypharpax queenslandicus	3	33.3			300	NL
Idacarabus longicollis	3	100.0	TAS	Cave	400	NL
Laccopterum darwiniense	3	33.3			400	NL
Lacordairia proxima	3	33.3	SE	For	300	NL
Leiradira latreillei latreillei	3	66.7			200	NL
Loxandrus gagatinus	3	33.3	TAS		300	NL
Loxandrus nq1	3	66.7			300	NL
Megadromus eborensis	3	100.0			100	NL
Morion longicollis	3	33.3			400	NL
Notiobia flavipalpis	3	33.3			200	NL
Notonomus carteri	3	66.7			300	NL
Notonomus froggatti	3	33.3			300	NL
Notonomus queenslandicus	3	66.7	E	For	200	NL
Notonomus strzeleckianus	3	66.7			300	NL
Notonomus truncatus	3	66.7			200	NL
Pamborus pradieri darlingtoni	3	66.7	E	For	200	NL
Paranurus macleayi	3	33.3	NE	For	300	NL
Percosoma substriatum	3	66.7	SE	For	200	NL
Perigona picta	3	33.3			300	NL
Phaenaulax nanus	3	33.3			300	NL
Philipis bicolor	3	100.0	QLD	For	200	NL
Philipis distinguenda	3	100.0	QLD	For	200	NL
Philipis ellioti	3	100.0	QLD	For	100	NL

Philipis picta	3	100.0	QLD	For	200	NL
Philipis trunci	3	100.0	QLD	For	200	NL
Philophloeus moestus	3	100.0	SE	Euc	300	NL
Philophloeus quadripennis	3	66.7	E,SE	Euc	200	NL
Platycoelus poeciloides	3	33.3			400	NL
Platylytron amplipenne	3	33.3	SW,W		300	NL
Promecoderus olivaceus	3	33.3			300	NL
Sarothrocrepis tridens	3	66.7	SA	Euc	300	NL
Sarticus civilis	3	33.3			300	NL
Sarticus dixoni	3	33.3	NSW, VIC	SL	300	NL
Sarticus impar	3	33.3			300	NL
Sarticus sulcatus	3	33.3			500	NL
Scopodes aeneus	3	33.3			300	NL
Scopodes intricatus	3	66.7			300	NL
Simodontus rufipalpis	3	33.3			300	NL
Sphallomorpha discoidalis	3	33.3			300	NL
Sphallomorpha dubia	3	33.3	ACT, NSW, NT, QLD	For	300	NL
Stichonotus piceus	3	66.7	TAS	For	500	NL
Tachys transversicollis	3	33.3			300	NL
Trechodes lustrans	3	33.3	QLD	Rip	300	NL
Trichosternus nq2	3	100.0	NE?		200	NL
Adelotopus zonatus	3	0.0			300	NL
Aephnidius adelioides	3	0.0	QLD, WA		300	NL
Agonocheila macleayi	3	0.0	NSW	Euc	300	NL
Amblystomus gracilis	3	0.0			300	NL
Amblystomus ovalis	3	0.0			300	NL
Amblytelus amplipennis	3	0.0			300	NL
*Arthropterus ambs*1	3	0.0			200	NL
*Arthropterus ambs*1 2	3	0.0			300	NL
Arthropterus cribrosus	3	0.0			200	NL
Arthropterus elongatulus	3	0.0			300	NL
Arthropterus mastersii	3	0.0			300	NL
Arthropterus piceus	3	0.0			300	NL
Brithysternum calcaratum	3	0.0	QLD		300	NL
Cainogenion subopacum	3	0.0	NSW, QLD	Euc	300	NL
Carenum amplicolle	3	0.0			300	NL
Carenum breviforme	3	0.0			300	NL
Carenum cupreomarginatum	3	0.0			400	NL
Carenum occidentale	3	0.0			300	NL
Carenum optimum	3	0.0			300	NL
Carenum rectangulare	3	0.0			300	NL
Carenum simile	3	0.0			300	NL
Carenum subcostatum	3	0.0			300	NL
Cerotalis brachypleura	3	0.0			400	NL
Cicindela mastersi catoptriola	3	0.0	NSW, NT, QLD, WA	Rip	400	NL
Cicindela mastersi mastersi	3	0.0			300	NL
Cicindela oblongicollis	3	0.0			300	NL
Clivina ferruginea	3	0.0			300	NL

Clivina pectonoda	3	0.0			300	NL
Clivina vittata	3	0.0			300	NL
Darodilia mandibularis	3	0.0			300	NL
Darodilia robusta	3	0.0	QLD	For	300	NL
*Egadroma ambs*1 1	3	0.0			300	NL
Elaphropus amplipennis	3	0.0	QLD, WA		300	NL
Elaphropus convexus	3	0.0	NSW, QLD	Rip	500	NL
Elaphropus curticollis	3	0.0	NSW, NT, QLD, WA	Rip	300	NL
Eudalia nigra	3	0.0			300	NL
Gigadema gulare	3	0.0			300	NL
Gigadema maxillare	3	0.0			400	NL
Homethes sericeus	3	0.0			300	NL
Hypharpax deyrollei	3	0.0			300	NL
Lecanomerus verticalis	3	0.0			400	NL
Megacephala corpulenta	3	0.0			300	NL
Meonis angusticollis	3	0.0			300	NL
Myrmecodemus riverinae	3	0.0			300	NL
Notiobia rugosipennis	3	0.0			400	NL
*Notonomus cbcr*3 1	3	0.0			300	NL
*Notonomus cbcr*3 2	3	0.0			200	NL
Notonomus excisipennis	3	0.0			300	NL
Notonomus miles	3	0.0			300	NL
Notonomus nitidicollis	3	0.0			400	NL
Notonomus phillipsii	3	0.0	SE	For	300	NL
Notospeophonus castaneus	3	0.0	SE		300	NL
Oodes impressus	3	0.0			300	NL
Oodes trisulcatus	3	0.0			400	NL
Parroa violacea	3	0.0	E	Sc	300	NL
Philophloeus sydneyensis	3	0.0			300	NL
Philophloeus unicolor	3	0.0	E,SE,QLD,SA,WA	Euc	300	NL
Phorticosomus nuytsii	3	0.0	NE,CN		300	NL
Promecoderus distinctus	3	0.0			300	NL
Promecoderus elegans	3	0.0	SE	For	300	NL
Prosopogmus nq1	3	0.0			100	NL
Rhytisternus bovilli	3	0.0	NT		300	NL
Sarothrocrepis pallida	3	0.0	QLD	Euc	300	NL
Sarticus cycloderus	3	0.0			300	NL
Sarticus esmeraldipennis	3	0.0	SA, VIC	WL	300	NL
Scaraphites laticollis	3	0.0			300	NL
Scaraphites laticollis laticollis	3	0.0			300	NL
Scaraphites lenaeus	3	0.0			300	NL
Scaraphites lucidus	3	0.0			300	NL
Scopodes angulicollis	3	0.0			300	NL
Secatophus australis	3	0.0			300	NL
Simodontus aeneipennis	3	0.0			300	NL
Simodontus holomelanus	3	0.0			300	NL
Sphallomorpha communis	3	0.0			300	NL
Sphallomorpha similata	3	0.0			300	NL

Trechodes bipartitus	3	0.0	ACT, NSW, QLD	Rip	300	NL
Abacetus thouzeti	4	50.0	NSW, QLD, WA	Rip	400	NL
Amblytelus vittipennis	4	25.0			500	NL
Anomotarus nq3	4	100.0			300	NL
Carenum splendens	4	50.0	QLD		300	NL
Carenum sumptuosum	4	25.0			400	NL
Casnoidea thouzeti	4	50.0			600	NL
Catascopus laticollis	4	25.0	QLD	For	400	NL
Chlaenius greyanus	4	25.0	WA		400	NL
Coleolissus papua	4	25.0			400	NL
Craspedophorus 1	4	50.0			300	NL
Delinius castelnaui	4	50.0			500	NL
Dicranoglossus resplendens	4	25.0	NT, QLD, WA		400	NL
Distipsidera obscura	4	50.0	QLD	For	200	NL
Gigadema grande	4	25.0			400	NL
Hypharpax rotundipennis	4	25.0			500	NL
Laccopterum cyaneum	4	25.0	QLD	WL,SL	300	NL
Lachnoderma foveolatum	4	50.0			400	NL
Leiradira nq4	4	100.0			100	NL
Liopasa crepera	4	25.0	NSW,QLD		300	NL
Meonis 1	4	75.0			400	NL
Minuthodes queenslandica	4	50.0			400	NL
Morion germanus	4	75.0	NE,E	For	400	NL
Notonomus 1	4	75.0			200	NL
*Notonomus cbcr*3 4	4	25.0			400	NL
Notonomus frontevirens	4	75.0	E	For	200	NL
Philipis agnicapitis	4	100.0	QLD	For	100	NL
Philipis planicola	4	100.0	QLD	For	200	NL
Philipis ruficollis	4	100.0	QLD	For	100	NL
Philophloeus eucalypti	4	50.0	E,SE,TAS,CS	Euc	400	NL
Promecoderus inornatus	4	25.0			400	NL
Promecoderus longus	4	100.0	TAS	For	200	NL
Promecoderus viridiaeneus	4	25.0	SE,TAS		500	NL
Rhytisternus limbatus	4	25.0			400	NL
Sphallomorpha grandis	4	25.0			400	NL
Stichonotus limbatus	4	50.0	VIC	For	300	NL
Tachys lindi	4	25.0	NSW, QLD, SA, WA		500	NL
Teropha besti	4	50.0	VIC	For,WL	300	NL
Theprisa montana	4	50.0	VIC		400	NL
Trigonothops pallidicollis	4	25.0			400	NL
Anomotarus variegatus	4	0.0			400	NL
Arthropterus hopei	4	0.0	NSW, SA, VIC		400	NL
Basistichus micans	4	0.0	NT, QLD		400	NL
Cainogenion ephippiatum	4	0.0			400	NL
Catascopus chaudoiri	4	0.0	NSW, QLD	For	400	NL

Chlaenius hamifer	4	0.0			400	NL
Cicindela mastersi	4	0.0	ACT, NSW, QLD	Rip	400	NL
Cicindela rafflesia	4	0.0			600	NL
Clivina atrata	4	0.0			400	NL
Clivina elegans	4	0.0			400	NL
Conopterum leai	4	0.0			600	NL
Craspedophorus banksi	4	0.0			400	NL
Craspedophorus macleayi	4	0.0	WA	SL	400	NL
Deipyrus palustris	4	0.0			300	NL
Demetrida angustula	4	0.0			400	NL
Elaphropus bipustulatus	4	0.0			400	NL
Eudalia latipennis	4	0.0	NT, QLD, WA	Rip	400	NL
Gnathaphanus riverinae	4	0.0	E,SE		400	NL
Gnathoxys insignitus	4	0.0	SW		400	NL
Haplaner australis	4	0.0			400	NL
Hypharpax vilis	4	0.0			400	NL
Lacordairia cychroides	4	0.0	E	For	400	NL
*Lecanomerus ambs*1 1	4	0.0			400	NL
Lecanomerus tasmanicus	4	0.0	E,SE		400	NL
Megacephala greyanus	4	0.0	NW,W	Rip	500	NL
Megacephala pulchra	4	0.0	W		400	NL
Notiobia dampierii	4	0.0	SA,WA		400	NL
Notiobia inaequalipennis	4	0.0			400	NL
Notonomus mediosulcatus	4	0.0			400	NL
Notonomus satrapa	4	0.0	SE	For	400	NL
Oodes inornatus	4	0.0			400	NL
Oodes waterhousei	4	0.0			500	NL
Perigona rufilabris	4	0.0			400	NL
Promecoderus ovicollis	4	0.0			400	NL
Promecoderus semistriatus	4	0.0			500	NL
*Prosopogmus cbcr*3 1	4	0.0			400	NL
Prosopogmus oodiformis	4	0.0	E,SE	For,WL	400	NL
Scaraphites hirtipes	4	0.0	SA, VIC	WL,SL	500	NL
Scaraphites silenus	4	0.0			400	NL
Scopodes boops	4	0.0	ACT, NSW, QLD, SA, VIC, WA		500	NL
Sphallomorpha ruficollis	4	0.0			400	NL
Steganomma porcatum	4	0.0	QLD	For	300	NL
Tachys fasciatus	4	0.0			400	NL
Tachys latissimus	4	0.0			400	NL
Tachys mulwalensis	4	0.0	NSW, SA		400	NL
Adelotopus haemorrhoidalis	5	40.0	ACT, NSW, QLD, TAS, VIC	Euc	500	NL
Carenum cordipenne	5	40.0	SA, VIC	Sc	500	NL
Celanida montana	5	60.0	VIC	For	500	NL
*Eurylychnus cbcr*3	5	60.0			500	NL

Lacordairia nq1	5	100.0			500	NL
Meonis semistriatus	5	60.0	E		400	NL
Notonomus opulentus gippslandicus	5	60.0	SE	For	600	NL
Pentagonica vittipennis	5	100.0			500	NL
Percosoma concolor	5	80.0	SE	For	300	NL
Percosoma montanum	5	40.0	SE	For	400	NL
Philipis alutacea	5	100.0	QLD	For	200	NL
Philipis frerei	5	100.0	QLD	For	100	NL
Philipis unicolor	5	100.0	QLD	For	300	NL
Philophloeus angulatus	5	40.0	SE	Euc	300	NL
*Prosopogmus cbcr*3 2	5	60.0			500	NL
Adelotopus rufoguttatus	5	0.0	NSW, QLD	Euc	500	NL
Agonocheila suturalis	5	0.0			500	NL
Carenum subporcatulum	5	0.0	QLD	WL	500	NL
Carenum transversicolle	5	0.0	NT		600	NL
Cerotalis semiviolacea	5	0.0			500	NL
Cicindela leai	5	0.0	QLD	Rip	400	NL
Cicindela mastersi plebeia	5	0.0			400	NL
Clivina lepida	5	0.0			600	NL
Clivina suturalis	5	0.0			600	NL
Conopterum riverinae	5	0.0	NSW, VIC	WL, Sc,	500	NL
Craspedophorus rockhamptonensis	5	0.0			500	NL
Demetrida picipennis	5	0.0	NSW	Euc	600	NL
Elaphropus striolatus	5	0.0			500	NL
Eudalia macleayi	5	0.0			500	NL
Homethes gracilis	5	0.0	E,SE		500	NL
Hypharpax kreftii	5	0.0			600	NL
Laccopterum spencei	5	0.0			500	NL
Lorostema bothriophora	5	0.0	E,NE		400	NL
Mecyclothorax punctipennis	5	0.0	E,SE,CS	RF	600	NL
Melisodera picipennis	5	0.0	E,SE		600	NL
Notonomus macoyi	5	0.0	SE		500	NL
Notonomus striatocollis	5	0.0			600	NL
Parena picea	5	0.0			600	NL
Promecoderus gibbosus	5	0.0			500	NL
Sarothrocrepis fasciata	5	0.0			500	NL
Sarothrocrepis mastersii	5	0.0			400	NL
Sphallomorpha decipiens	5	0.0			500	NL
Sphallomorpha polita	5	0.0			500	NL
Stricklandia nigra	5	0.0	QLD		400	NL
Trechobembix baldiensis	5	0.0	NSW, QLD, SA, TAS, VIC, WA		500	NL
Trichisia azurea	5	0.0			600	NL
Agonocheila biguttata	5	20.0	ACT, NSW, TAS, WA		500	NL
Agonocheila plagiata	5	20.0	NSW, TAS	Euc	300	NL
Agonocheila ruficollis	5	20.0			500	NL

Amblytelus discoidalis	5	20.0			500	NL
Carenum quadripunctatum	5	20.0	QLD		400	NL
Carenum versicolor	5	20.0	VIC	Sc	500	NL
Clarencia aliena	5	20.0	NSW, NT, QLD	Wet	500	NL
Coptodera australis	5	20.0			500	NL
Notiobia denisonensis	5	20.0			600	NL
Notonomus auricollis	5	20.0	E,SE	For	500	NL
Philoscaphus mastersii	5	20.0	NE,E,W	WL	500	NL
Promecoderus dorsalis	5	20.0			500	NL
Acrogenys hirsuta	6	0.0			600	NL
Adelotopus paroensis	6	0.0	NSW, QLD, SA, VIC	Euc	600	NL
Amblytelus marginicollis	6	16.7	ACT, NSW, VIC	Euc, For, WL	500	NL
Arthropterus 1	6	33.3			600	NL
Carenum anthracinum	6	0.0	NSW, SA, VIC	Sc	500	NL
Carenum interiore	6	0.0			600	NL
Carenum opacicolle	6	16.7	QLD		400	NL
Castelnaudia cyaneotincta	6	0.0	NSW, QLD	WL, For	600	NL
Cerotalis substriata	6	16.7	WA		600	NL
Cicindela discreta	6	16.7	NT, QLD, WA	Rip, Beaches	500	NL
Cicindela doddi	6	16.7	QLD	Rip	500	NL
Craspedophorus insignis	6	33.3	QLD	SL	400	NL
Demetrida brachinodera	6	16.7	ACT, NSW, SA, VIC	Euc	600	NL
Demetrida lineata	6	66.7	ACT, NSW, SA, VIC, WA	Euc	600	NL
Distipsidera parva	6	33.3	QLD	For	500	NL
Helluonidius cyanipennis	6	16.7	E,NE,NW		700	NL
Homethes guttifer	6	16.7	SE,CS,SW		600	NL
Hypharpax peronii	6	16.7	SE,CS		600	NL
Laccopterum nq1	6	83.3			600	NL
Leiradira tenuis	6	50.0			400	NL
Notonomus besti	6	33.3			600	NL
Notonomus colossus	6	66.7	E	WL	500	NL
Notonomus hopsoni	6	16.7	E	For	600	NL
Notonomus kingi	6	33.3			400	NL
Notonomus molestus	6	33.3	SE	For,Sc	600	NL
Notonomus planipectus	6	50.0	E	For	500	NL
Notonomus triplogenioides	6	16.7			500	NL
Oodes oblongus	6	0.0			600	NL
Paranurus dilaticeps	6	16.7	NE		400	NL
Percosoma carenoides	6	50.0	TAS	For	600	NL
Philipis castanea	6	100.0	QLD	For	200	NL
Philipis sulcata	6	83.3	QLD	For	400	NL

Promecoderus lucidicollis	6	0.0			600	NL
Rhytisternus carpentarius	6	0.0			600	NL
Rhytisternus laevidorsis	6	16.7			500	NL
Rhytisternus laevilaterus	6	33.3			600	NL
Simodontus australis	6	16.7			600	NL
Sphallomorpha ovalis	6	33.3			600	NL
Trichosternus nq3	6	100.0	NE?		100	NL
Trigonothops meyeri	6	16.7	VIC	Euc	700	NL
Adelotopus politus	7	0.0	NSW, QLD, VIC	Euc	800	NL
Agonocheila antipodum	7	28.6	ACT, NSW, TAS	Euc	700	NL
Agonocheila fenestrata	7	14.3	ACT, SA, TAS, VIC, WA	Euc	700	NL
Cerotalis amabilis	7	0.0	QLD, SA	WL	700	NL
Cicindela upsilon upsilon	7	0.0			700	NL
Clivina heterogena	7	14.3	NSW, NT, SA, TAS, VIC, WA	Rip	800	NL
Clivina planiceps	7	0.0	NSW, VIC	Rip	600	NL
Coptodera mastersii	7	14.3	QLD	For	600	NL
Desera smaragdina	7	0.0	QLD	Wet	700	NL
Elaphropus spenceri	7	0.0	NT, QLD, SA, WA	Rip	800	NL
Helluodema unicolor	7	14.3	E,NE,CN		700	NL
Helluonidius latipennis	7	14.3	NE,SE		600	NL
Homethes elegans	7	0.0	SE,TAS		700	NL
Laccopterum foveigerum	7	0.0	NW,W,E	WL,SL	700	NL
Lacordairia nq2	7	100.0			500	NL
Mecyclothorax nq1	7	71.4			400	NL
Megacephala crucigera	7	0.0			700	NL
Notagonum lafertei	7	14.3	NE,E		700	NL
Notiobia germari	7	14.3	ACT,NSW,QLD,VIC		700	NL
Notonomus bodeae	7	0.0	E,SE	For	600	NL
Notonomus chalybaeus	7	42.9	E,SE	For	700	NL
Notonomus nitescens	7	14.3	E	For	600	NL
Notonomus nq2	7	57.1			300	NL
Parroa apicalis	7	42.9			700	NL
Philipis cooki	7	100.0	QLD	For	400	NL
Philipis tribulationis	7	100.0	QLD	For	300	NL
Philophloeus fuscipennis	7	0.0			700	NL
Philoscaphus costalis	7	0.0			700	NL
Pseudoceneus sollicitus	7	28.6	ACT,TAS		800	NL
Rhabdotus reflexus	7	57.1	TAS	For	700	NL
Sarticus blackburni	7	57.1	VIC	Al	400	NL
Scopodes sigillatus	7	14.3	ACT, NSW, QLD, SA, TAS, VIC,		800	NL

			WA			
Sphallomorpha maculigera	7	0.0			700	NL
Agonocheila sinuosa	8	25.0	QLD, TAS	Euc	800	NL
Calosoma oceanicum	8	0.0	NT, QLD, WA		800	NL
Cratogaster sulcata	8	12.5			900	NL
Distipsidera flavipes	8	25.0	QLD	For	600	NL
Distipsidera undulata	8	12.5	NSW, QLD	For	800	NL
Drypta australis	8	0.0	ACT, NSW, QLD, SA, VIC	WL	800	NL
Euryscaphus carbonarius	8	0.0			800	NL
Lecanomerus vestigialis	8	0.0			800	NL
Loxandrus quadricollis	8	12.5	E,SE,CS		800	NL
Megacephala blackburni	8	0.0	W,SW	Wet	800	NL
Megacephala bostockii	8	0.0	NW,CN,NE		700	NL
Morion australis	8	37.5	E,SE	For	800	NL
Notagonum marginellum	8	62.5	SE,TAS		800	NL
Notonomus crenulatus	8	37.5	E	For	700	NL
Notonomus dyscoloides	8	25.0	E,SE		600	NL
Notonomus kershawi	8	25.0	SE	For	700	NL
Nurus atlas	8	0.0	E	For	300	NL
Nurus grandis	8	100.0	QLD	For	100	NL
Nurus imperialis	8	50.0	E	For	300	NL
Nurus rex	8	100.0	NE	For	200	NL
Philipis rufescens	8	100.0	QLD	For	100	NL
Philophloeus puberulus	8	12.5	SE	Euc	700	NL
Sarothrocrepis luctuosa	8	37.5	ACT, NSW, TAS, VIC	Euc	800	NL
Sarothrocrepis suavis	8	25.0	ACT, NSW, SA, VIC	Euc	800	NL
Sarticus obesulus	8	12.5			800	NL
Tachys captus	8	12.5			900	NL
Teraphis melbournensis	8	25.0	NSW, VIC	For	700	NL
Trichosternus fisheri	8	75.0	QLD	For	200	NL
Trichosternus simplicipes	8	50.0	QLD	For	200	NL
Aenigma iris	9	0.0	NSW, QLD		900	NL
Arthropterus brevis	9	22.2	NSW		1000	NL
Arthropterus denudatus	9	0.0			900	NL
Cainogenion ipsoides	9	0.0	ACT, NSW, QLD, SA, VIC, WA		900	NL
Carenum nq1	9	55.6	QLD		800	NL
Castelnaudia eungella	9	66.7	QLD	For	400	NL
Castelnaudia spec	9	66.7	QLD	For	300	NL
Catadromus tenebrioides	9	33.3	NT, QLD, SA, VIC	For, Rip	900	NL
Clivina dilutipes	9	0.0			800	NL
Coptocarpus nq1	9	100.0			600	NL
Craspedophorus alternans	9	0.0	QLD	SL	900	NL

Dicraspeda nitida	9	66.7	QLD	RF	900	NL
Euthenarus bicolor	9	33.3			900	NL
Helluonidius cyaneus	9	11.1	NE,E,SW		900	NL
Laemostenus complanatus	9	11.1	SW,CS,SE		900	NL
Leiradira soror	9	77.8			500	NL
Neocarenum elongatum	9	44.4	NE,SE,I,CS. W,SW	Sc	900	NL
Notonomus australasiae	9	0.0			800	NL
Notonomus croesus	9	22.2	SE	For	800	NL
Notonomus ellioti	9	100.0	NE	For	200	NL
Notonomus gippsiensis	9	33.3	SE	For	800	NL
Notonomus nq1	9	100.0			200	NL
Notonomus taylori	9	22.2	E,SE	For	800	NL
Philipis lustrans	9	100.0	QLD	For	600	NL
Philophloeus luculentus	9	22.2	E,SE	Euc	1000	NL
Phorticosomus horni	9	0.0	E,I,W,CN		800	NL
Prosopogmus monochrous	9	0.0			900	NL
Sarticus coradgeri	9	0.0	NSW	Sc	900	NL
Siagonyx amplipennis	9	33.3	NSW, QLD	For	900	NL
Sloaneana tasmaniae	9	33.3	ACT, NSW, TAS, VIC	For	1300	NL
Sphallomorpha hydroporoides	9	0.0	ACT, NSW, NT, QLD, SA, TAS, VIC, WA	Euc	900	NL
Agonocheila lutosa	10	10.0	SA	Euc	1000	NL
Arthropterus angulatus	10	0.0			1000	NL
Cainogenion obscurum	10	10.0	NSW, QLD, SA, VIC	Euc	1000	NL
Carenum 1	10	70.0			900	NL
Carenum marginatum	10	10.0			1000	NL
Carenum scaritoides	10	30.0			1100	NL
Castelnaudia 2	10	60.0			1000	NL
Castelnaudia cyanea	10	60.0	NSW, QLD	For	800	NL
Cenogmus castelnaui	10	10.0	ACT, NSW, QLD, SA, TAS, VIC, WA		1100	NL
Craspedophorus australasiae	10	10.0			1200	NL
Craspedophorus australis	10	10.0			1000	NL
Gnathaphanus philippensis	10	10.0	W,NW,CN,N E,E		900	NL
Laccopterum loculosum	10	10.0	VIC,NSW	WL,SL	1000	NL
Lecanomerus discoidalis	10	20.0	SE,E		1000	NL
Megacephala australasiae	10	10.0			1300	NL
Megacephala basalis	10	0.0	NE,CN,W,S W	Rip	1000	NL
Notiobia melanaria	10	0.0	NSW,QLD		1000	NL
Nurus brevis	10	60.0	E	For	300	NL
Nurus niger	10	50.0	QLD	For	400	NL

Pamborus elegans	10	70.0	E	For	600	NL
Philophloeus planus	10	10.0	E,SE.I	Euc	1000	NL
Promecoderus gracilis	10	0.0			1000	NL
Sarothrocrepis benefica	10	10.0	NT, QLD, SA, TAS, VIC, WA	Euc	1100	NL
Sarticus aubei	10	0.0			1000	NL
Siagonyx blackburni	10	30.0	NSW, VIC	For	1000	NL
Sphallomorpha guttigera	10	0.0	ACT, NSW, QLD, SA, VIC	Euc	1000	NL
Trigonothops longiplaga	10	20.0	ACT, NSW, SA, VIC, WA	Euc	1000	NL

Removal of extinct and poorly recorded species leaves 6537 records in ANHAT for 204 species (and subspecies). The mean number of records per species for species with greater than 10 records was 32.0, with a mean of 37.2 for the percent of records in the NRS.

Seventy-four species of ground beetles had 45% or greater of individual site records located within the NRS (**Table 73**). None of the 74 species are listed as threatened. Of the 74 species, 58 have location information and all these species are found in eastern Australia, including two species from Tasmania. The majority of species (47) are found in forested habitats.

Table 73. Ground beetles species with >45% of site records within the NRS.

Species	No. Records	Records in NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Laccopterum deauratum	31	14	45.2	NE,E	WL,SL	1000	NL
Eurylychnus regularis	11	5	45.4	NSW	For	800	NL
Castelnaudia speciosa	46	21	45.6	NSW	For	2800	NL
Notonomus sphodroides	13	6	46.1	SE	For	1200	NL
Percosoma sulcipenne	21	10	47.6	TAS	For	1000	NL
Leiradira alternans	41	20	48.8	NE	For	1400	NL
Castelnaudia porphyriaca	12	6	50.0	QLD	For	600	NL
Notonomus 3	14	7	50.0			1200	NL
Notonomus rainbowi	40	20	50.0	SE	For	2400	NL
Setalis niger	70	35	50.0	NSW, QLD	For	4700	NL
Trichosternus vigorsi	194	97	50.0	NSW	For	10500	NL
Castelnaudia wilsoni	51	26	51.0	QLD	For	2300	NL
Trichosternus perater	45	23	51.1	NSW	For	700	NL
Castelnaudia setosiceps	41	21	51.2	QLD	For	1900	NL
Notonomus variicollis	39	20	51.3	E,SE	For	2700	NL

Pamborus macleayi	68	35	51.5	E	For	2900	NL
Mystropomus subcostatus	148	79	53.4	E		8700	NL
Leiradira auricollis	46	25	54.3	E	For	3000	NL
Nurus medius	22	12	54.5	NE	For	700	NL
Pamborus pradieri	46	26	56.5	E		2000	NL
Pamborus alternans	325	188	57.8	E	For	12500	NL
*Nurus nsw*1	19	11	57.9			400	NL
Notonomus masculinus	41	24	58.5	E,NE	For	1300	NL
Notolestus sulcipennis	54	32	59.3	E	For	2700	NL
Pamborus brisbanensis	40	24	60.0	E		2400	NL
Trichosternus nudipes	33	20	60.6	QLD	For	500	NL
Trichosternus angulosus	23	14	60.9	NSW, QLD		500	NL
Pamborus guerinii	210	130	61.9	E	For	8300	NL
Castelnaudia marginifera	87	54	62.1	NSW, QLD	For	4700	NL
Notonomus doddi	49	31	63.3	NE	For	1700	NL
Zeodera atra	30	19	63.3	NSW, QLD	For	1300	NL
Castelnaudia septemcostata	44	28	63.6	NSW, QLD	For	1600	NL
Coptocarpus philipi	14	9	64.3	QLD		800	NL
Notonomus tubericauda	14	9	64.3	E,SE,TAS	For	1300	NL
Cratoferonia phylarchus	125	81	64.8	NSW, QLD	For	5900	NL
Eurylychnus cylindricus	12	8	66.7	NSW	For	800	NL
Setalis rubripes	12	8	66.7	QLD	For	900	NL
Pamborus punctatus	11	8	72.7		For	600	NL
*Promecoderus cbcr*3 1	11	8	72.7			900	NL
*Trichosternus nsw*1	12	9	75.0	NSW		600	NL
Philipis thompsoni	24	18	75.0	QLD	For,RF	1800	NL
Lecanomerus niger	48	36	75.0		For,Lit	1800	NL
Pamborus tropicus	121	93	76.9	NE	For	4100	NL
Mystropomus regularis	88	68	77.3	NE		3300	NL
Trichosternus mutatus	15	12	80.0	QLD	For	800	NL
Trichosternus soror	22	18	81.8	QLD	For	900	NL
Loxogenius opacipennis	33	27	81.8	NE		1400	NL
Illaphanus nq1	13	11	84.6			1100	NL
Nurus nox	14	12	85.7	E		700	NL
*Castelnaudia cq*1	21	18	85.7			600	NL
Nurus latipennis	39	34	87.2	E	For	1200	NL
Sitaphe rotundata	74	65	87.8	QLD	RF	2500	NL

Pamborus subtropicus	19	17	89.5	E	For	800	NL
Trichosternus fax	20	18	90.0	QLD	For	300	NL
Anomotarus nq1	11	10	90.9			700	NL
Notonomus spurgeoni	61	56	91.8	NE	For	1000	NL
Leiradira nq2	15	14	93.3			700	NL
Raphetis gracilis	15	14	93.3	QLD		1000	NL
Trichosternus frater	33	31	93.9	QLD	For	1400	NL
Leiradira opacistriatis	34	32	94.1			1700	NL
Castelnaudia obscuripennis	125	118	94.4	QLD	For	2200	NL
Mecyclothorax storeyi	18	17	94.4		Lit	400	NL
Pamborus opacus	98	93	94.9	E,NE	For	1600	NL
Leiradira nq3	11	11	100.0			100	NL
Notonomus dimorphicus	11	11	100.0	NE	For	400	NL
Leiradira alticola	13	13	100.0			200	NL
Philipis sinuata	14	14	100.0	QLD	For	300	NL
*Castelnaudia cq*2	15	15	100.0			300	NL
Leiradira aurifer	15	15	100.0			300	NL
Notonomus montellus	20	20	100.0	NE	For	400	NL
Trichosternus montorum	22	22	100.0	QLD	For	300	NL
Notonomus flos	27	27	100.0	NE	For	400	NL
Mecyclothorax lewisensis	29	29	100.0		Lit	900	NL
Notonomus montorum	38	38	100.0	NE		700	NL

Forty-nine species had less than 10% of ANHAT records located within PAs (**Table 74**). All of the ground beetles species are classified as not listed. These species are widespread throughout Australia, with most occurring in either forested/woodland or riparian habitats.

Table 74. Ground beetles species with <10% of ANHAT records located within the NRS.

Species	No. Records	Inside NRS	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Gigadema bostocki	11	0	0.0			1000	NL
Helluo insignis	11	0	0.0			1100	NL
Phorticosomus felix	11	0	0.0	E,SE,CS		1000	NL
Promecoderus concolor	11	0	0.0			1100	NL
Parroa howittii	12	0	0.0	E,SW,W,NW	Sc	1200	NL
Sphallomorpha albopicta	12	0	0.0			1200	NL
Castelnaudia superba	13	0	0.0	NSW	WL, Sc	1200	NL

Cenogmus interioris	13	0	0.0			1300	NL
Euryscaphus dilatatus	13	0	0.0			1200	NL
Sarticus habitans	13	0	0.0	ACT, NSW	WL	1200	NL
Gigadema nocte	14	0	0.0	NSW, QLD, SA		1400	NL
Gigadema sulcatum	15	0	0.0	NSW, NT, QLD, SA, WA		1400	NL
Pericompsus australis	15	0	0.0	NSW,QLD,SA,TAS,VIC,WA		1400	NL
Chlaenius ophonoides	20	0	0.0	NSW, NT, QLD		2000	NL
Notonomus scotti	20	0	0.0	E	For	1900	NL
Chlaenius darlingensis	25	0	0.0	ACT, NSW, NT, QLD, SA, VIC, WA	Rip	2500	NL
Carenum tinctilatum	27	0	0.0	ACT, NSW, QLD, VIC	WL, Sc	2600	NL
Chlaenius flaviguttatus	32	0	0.0	NSW, NT, QLD		3100	NL
Geoscaptus laevissimus	48	2	4.2	NSW, NT, SA, VIC, WA		4900	NL
Arthropterus westwoodii	23	1	4.3			2400	NL
Catadromus lacordairei	23	1	4.3	ACT, NSW, NT, QLD, SA, TAS, VIC, WA	He, WL, For, Rip	2300	NL
Geoscaptus cacus	23	1	4.3	NT, QLD, SA		2500	NL
Rhytisternus cyathoderus	22	1	4.5	NSW, SA, TAS, VIC	WL,SL	2200	NL
Clivina procera	20	1	5.0	NSW, SA, VIC	Rip	2000	NL
Hyperion schroetteri	20	1	5.0	E,SE,CS		2000	NL
Egadroma piceus	19	1	5.3			2000	NL
Rhytisternus liopleurus	16	1	6.2			1700	NL
Sarticus discopunctatus	16	1	6.2			1500	NL
Gnathaphanus pulcher	63	4	6.3	W,NW,CN,NE,E,SE		6100	NL
Apotomus australis	15	1	6.7	NSW, NT, QLD, SA, VIC, WA		1400	NL
Clivina australasiae	14	1	7.1			1300	NL
Philophloeus immaculatus	14	1	7.1	E,SE,NE	Euc	1400	NL
Adelotopus rubiginosus	13	1	7.7			1300	NL
Arthropterus wilsoni	13	1	7.7	NSW, SA		1200	NL
Sarticus cyaneocinctus	51	4	7.8	ACT, NSW, VIC	WL,Op	4800	NL

Megacephala australis	25	2	8.0	NE,SE,CS,I	Rip	2400	NL
Catadromus australis	12	1	8.3	ACT, NSW, QLD, SA, VIC, WA	SL, Rip	1200	NL
Philophloeus australis	12	1	8.3	E,SE,TAS	Euc	1200	NL
Sphallomorpha suturalis	24	2	8.3	NSW, NT, QLD, SA, VIC, WA	Euc	2400	NL
Philoscaphus tuberculatus	36	3	8.3	E,SE,CS,I,SW	Sc	3600	NL
Gnathaphanus melbournensis	11	1	9.1	TAS,SE,E,NE,CN		1200	NL
Notonomus philippi	22	2	9.1		For,Sc	1800	NL
Pheropsophus verticalis	65	6	9.2	NE,E,SE,CS,I	Rip	6300	NL
Calosoma schayeri	86	8	9.3	NSW, NT, QLD, SA, TAS, VIC, WA		8200	NL
Carenum bonellii	32	3	9.4	ACT, NSW, QLD, VIC	For	3300	NL
Bembidion jacksoniense	21	2	9.5	ACT, NSW, NT, QLD, SA, VIC, WA	Rip	2400	NL
Clivina basalis	21	2	9.5			2000	NL
Platycoelus melliei	21	2	9.5	E,CS,IW,NW,CN,SE		2100	NL
Megacephala cylindrica	20	2	10.0	CN,I.CS,E,NE	Rip	2100	NL

No ground beetles species had records in more than 100 separate reserves.

A total of 130 species had records in five or fewer PAs (

Table 75). No species were listed as threatened. All of the species in this list had fewer than 100 individual record sites, and no species had more than 63 record sites. One hundred and thirty-two species of ground beetles had records in five or fewer PAs greater than 1000 hectares, with none of these species being listed as threatened (

Table 75).

Table 75. Ground beetles species recorded from five or fewer PAs and five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Egadroma piceus	19	1	0	NL
Gnathaphanus melbournensis	11	1	1	NL
Leiradira nq3	11	1	1	NL

Catadromus australis	12	1	1	NL
Philophloeus australis	12	1	1	NL
Arthropterus wilsoni	13	1	1	NL
Adelotopus rubiginosus	13	1	1	NL
Leiradira alticola	13	1	1	NL
Loxodactylus carinulatus carinulatus	14	1	1	NL
Clivina australasiae	14	1	1	NL
Philophloeus immaculatus	14	1	1	NL
*Castelnaudia cq*2	15	1	1	NL
Apotomus australis	15	1	1	NL
Chylnus ater	15	1	1	NL
Rhytisternus liopleurus	16	1	1	NL
Sarticus discopunctatus	16	1	1	NL
Dicrochile goryi	16	1	1	NL
Hyperion schroetteri	20	1	1	NL
Notonomus montellus	20	1	1	NL
Trichosternus fax	20	1	1	NL
Castelnaudia mixta	20	1	1	NL
Clivina procera	20	1	1	NL
Megacephala cylindrica	20	1	1	NL
Trichosternus montorum	22	1	1	NL
Notonomus philippi	22	1	1	NL
Rhytisternus cyathoderus	22	1	1	NL
Sphallomorpha castelnaui	22	1	1	NL
Nurus medius	22	1	1	NL
Catadromus lacordairei	23	1	1	NL
Arthropterus westwoodii	23	1	1	NL
Geoscaptus cacus	23	1	1	NL
Laccopterum deauratum	31	1	1	NL
Pamborus transitus	45	1	1	NL
Trigonothops nigricollis	13	2	1	NL
Microlestodes macleayi	13	2	1	NL
Sphallomorpha suturalis	24	2	1	NL
Notonomus transitus	30	2	1	NL
Clivina biplagiata	11	2	2	NL
Coptodera aurata	11	2	2	NL
Acrogenys longicollis	11	2	2	NL
Notonomus leai	11	2	2	NL
Eurylychnus cylindricus	12	2	2	NL
Hypharpax australis	12	2	2	NL
Notonomus violaceus	12	2	2	NL
Notonomus arthuri	13	2	2	NL
Sarothrocrepis civica	13	2	2	NL
Euryscaphus obesus	13	2	2	NL
Minuthodes minima	13	2	2	NL
Dicraspeda obscura	14	2	2	NL
Laccopterum lacunosum	14	2	2	NL
Nurus nox	14	2	2	NL
Notonomus opulentus	14	2	2	NL
Philipis sinuata	14	2	2	NL

Sphallomorpha nitiduloides	14	2	2	NL
Gigadema longipenne	15	2	2	NL
Clivina quadratifrons	15	2	2	NL
Sarticus monarensis	16	2	2	NL
Anomotarus crudelis	16	2	2	NL
Carenum laevigatum	17	2	2	NL
Sarothrocrepis corticalis	18	2	2	NL
Mecyclothorax storeyi	18	2	2	NL
*Nurus nsw*1	19	2	2	NL
Nurus curtus	19	2	2	NL
*Castelnaudia cq*1	21	2	2	NL
Bembidion jacksoniense	21	2	2	NL
Clivina basalis	21	2	2	NL
Platycoelus melliei	21	2	2	NL
Megacephala australis	25	2	2	NL
Adelotopus dytiscides	27	2	2	NL
Carenum bonellii	32	2	2	NL
Geoscaptus laevissimus	48	2	2	NL
Lestignathus cursor	11	3	2	NL
Cicindela upsilon albicans	13	3	2	NL
Distipsidera grutii	14	3	2	NL
Notonomus saepistriatus	14	3	2	NL
Trichosternus mutatus	15	3	2	NL
Coptocarpus australis	23	3	2	NL
Notonomus peronii	11	3	3	NL
Notonomus dimorphicus	11	3	3	NL
*Promecoderus cbcr*3 1	11	3	3	NL
Trechimorphus diemenensis	11	3	3	NL
Notonomus johnstoni	12	3	3	NL
Castelnaudia porphyriaca	12	3	3	NL
Leiradira nq2	15	3	3	NL
Prosopogmus chalybeipennis	15	3	3	NL
Sphallomorpha fallax	15	3	3	NL
Philophloeus intermedius	16	3	3	NL
Mecyclothorax ambiguus	17	3	3	NL
Pamborus subtropicus	19	3	3	NL
Trigonothops pacifica	20	3	3	NL
Philophloeus distinguendus	21	3	3	NL
Rhytisternus miser	25	3	3	NL
Notonomus flos	27	3	3	NL
Trichosternus nudipes	33	3	3	NL
Philoscaphus tuberculatus	36	3	3	NL
Trichosternus perater	45	3	3	NL
Percosoma sulcipenne	21	4	1	NL
Notonomus tubericauda	14	4	2	NL
Trigonothops flavofasciata	37	4	2	NL
Leiradira aurifer	15	4	3	NL
Demetrida suturata	18	4	3	NL
Notonomus marginatus	27	4	3	NL
Distipsidera volitans	11	4	4	NL

*Trichosternus nsw*1	12	4	4	NL
Promecoderus brunnicornis	13	4	4	NL
Notonomus sphodroides	13	4	4	NL
Raphetis gracilis	15	4	4	NL
Notonomus australis	16	4	4	NL
Notonomus opacicollis	17	4	4	NL
Trichosternus angulosus	23	4	4	NL
Agonocheila perplexa	29	4	4	NL
Cratogaster melas	37	4	4	NL
Notonomus montorum	38	4	4	NL
Chlaenius australis	42	4	4	NL
Sarticus cyaneocinctus	51	4	4	NL
Gnathaphanus pulcher	63	4	4	NL
Pamborus punctatus	11	5	3	NL
Agonocheila cribripennis	16	5	3	NL
Demetrida vittata	24	5	3	NL
Trichosternus soror	22	5	4	NL
Amblytelus brevis	23	5	4	NL
Scaraphites rotundipennis	25	5	4	NL
Notonomus politulus	29	5	4	NL
Eurylychnus regularis	11	5	5	NL
Anomotarus nq1	11	5	5	NL
Notonomus amabilis	19	5	5	NL
Cratoferonia regalis	27	5	5	NL
Mecyclothorax lewisensis	29	5	5	NL
Notonomus rainbowi	40	5	5	NL
Agonocheila curtula	40	5	5	NL
Notonomus spurgeoni	61	6	5	NL
Coptocarpus philipi	14	7	4	NL
Setalis rubripes	12	7	5	NL

Water beetles (Dytiscidae)

The ANHAT database has 1888 records for 123 species and subspecies of Dytiscidae. No species of Dytiscidae are considered extinct.

There are 17 Dytiscidae species that account for approximately 50% of the total Dytiscid species records in ANHAT. These species have over 30 records each.

Table 76. Dytiscidae species that account for approximately 50% of the Dytiscid records in ANHAT.

Species	No. Records	% total records
Hydaticus consanguineus	38	2.00
Hydrovatus fasciatus	38	2.00
Platynectes decempunctatus	38	2.00
Copelatus clarki	39	2.06
Copelatus irregularis	46	2.43
Copelatus nigrolineatus	46	2.43
Laccophilus clarki	47	2.48
Bidessodes mjobergi	49	2.58
Hydrovatus opacus	55	2.90
Hydroglyphus basalis	61	3.22
Hydroglyphus daemeli	62	3.27
Laccophilus cingulatus	69	3.64
Hydrovatus rufoniger	82	4.32
Hyphydrus lyratus	84	4.43
Hydroglyphus godeffroyi	87	4.59
Hydrovatus ovalis	91	4.80
Allodessus bistrigatus	92	4.85
Total	1024	54

Seventy-three species had 10 or fewer individual record sites in the ANHAT database (**Table 77**). Of those species, none are listed as threatened. These species have been excluded from analysis but are included here for reference. Exclusion of these poorly recorded species eliminates 220 records. These species occur across all of Australia, with 25 species occurring in only one State or Territory and the remaining species occurring in at least one other State or Territory. Only one species had habitat details available. However, all species are aquatic and so are associated with water bodies of some type.

Table 77. Dytiscidae species with 10 or fewer individual site records in the ANHAT database.

Species	No. Records	% in NRS	Location	Veg type	Area (km^2)	EPBC status
Antiporus interrogationis	1	100.0	ACT, NSW, SA, VIC			NL
Chostonectes gigas	1	100.0	ACT, NSW, NT, QLD,			NL

			SA, TAS, VIC		
Clypeodytes darlingtoni	1	100.0	QLD		NL
Copelatus rasilis	1	100.0	NSW, QLD		NL
Limbodessus dispar	1	100.0	WA		NL
Megaporus hamatus	1	100.0	ACT, NSW, QLD, SA, TAS, VIC		NL
Megaporus solidus	1	100.0	WA		NL
Necterosoma aphrodite	1	100.0	VIC		NL
Paroster niger	1	100.0	WA		NL
Sternopriscus marginatus	1	100.0	WA		NL
Antiporus bakewellii	1	0.0	QLD, VIC, WA		NL
Antiporus simplex	1	0.0	QLD		NL
Australphilus saltus	1	0.0	QLD		NL
Barretthydrus tibialis	1	0.0	NSW		NL
Carabhydrus plicatus	1	0.0	QLD		NL
Copelatus australis	1	0.0	NSW, QLD, VIC		NL
Cybister loxidiscus	1	0.0	QLD		NL
Gibbidessus chipi	1	0.0	NSW, VIC		NL
Laccophilus quadrimaculatus	1	0.0	NT, QLD		NL
Limbodessus praelargus	1	0.0	ACT, NSW, VIC		NL
Necterosoma dispar	1	0.0	SA		NL
Necterosoma schmelzi	1	0.0	NSW, QLD		NL
Paroster sharpi	1	0.0	WA		NL
Platynectes octodecimmaculatus	1	0.0	NT, QLD, WA		NL
Sternopriscus minimus	1	0.0	WA		NL
Sternopriscus tarsalis	1	0.0	NSW, QLD, SA, TAS		NL
Tiporus centralis	1	0.0	NT, WA		NL
Tiporus collaris	1	0.0	NT, WA		NL
Batrachomatus wingii	2	50.0	NT, QLD		NL
Hydrovatus rufoniger politus	2	50.0	NSW, NT, QLD, SA, WA		NL
Sternopriscus cervus	2	50.0	NSW		NL
Terradessus caecus	2	100.0	QLD	For, Mon	NL
Limbodessus gemellus	2	0.0	NSW, SA, TAS, VIC		NL
Platynectes monostigma	2	0.0	NT, WA		NL
Sternopriscus mundanus	2	0.0	ACT, NSW, VIC		NL
Tiporus alastairi	2	0.0	WA		NL
Tiporus denticulatus	2	0.0	NT, QLD		NL
Hydaticus fabricii	3	66.7	NT		NL
Laccophilus religatus	3	33.3	NSW, NT, QLD, SA		NL
Limbodessus amabilis	3	33.3	SA, TAS, VIC		NL
Limbodessus occidentalis	3	33.3	WA		NL
Onychohydrus atratus	3	33.3	NT, QLD		NL
Sandracottus bakewelli	3	33.3	NT, QLD, SA, WA		NL
Sternopriscus pilbarensis	3	66.7	WA		NL
Antiporus blakei	3	0.0	ACT, NSW, SA, TAS, VIC		NL
Barretthydrus geminatus	3	0.0	NSW		NL

Copelatus tenebrosus	3	0.0	NT, QLD	NL
Hydaticus microdaemeli	3	0.0	NT, QLD	NL
Rhantus suturalis	3	0.0	ACT, NSW, NT, QLD, SA, TAS, VIC, WA	NL
Tiporus undecimmaculatus	3	0.0	NT, QLD, WA	NL
Austrodytes plateni	4	75.0	WA	NL
Chostonectes nebulosus	4	50.0	ACT, NSW, QLD, SA	NL
Hydroglyphus orthogrammus	4	50.0	WA	NL
Hydroglyphus signatus	4	75.0	NSW, QLD	NL
Hydrovatus weiri	4	75.0	QLD, WA	NL
Tiporus lachlani	4	25.0	WA	NL
Bidessodes bilita	4	0.0	NSW, QLD	NL
Cybister godeffroyi	5	40.0	NT, QLD	NL
Laccophilus seminiger	5	40.0	NT, QLD	NL
Hydaticus wattsi	5	20.0	QLD	NL
Hyphydrus decemmaculatus	5	20.0	NT, QLD	NL
Bidessodes grossus	6	0.0	QLD	NL
Chostonectes sharpi	6	33.3	NSW, QLD	NL
Copelatus melanarius	6	0.0	NSW, QLD	NL
Laccophilus univittatus	6	33.3	QLD	NL
Sternopriscus browni	7	14.3	WA	NL
Tiporus josepheni	7	14.3	NT, QLD, WA	NL
Tiporus tambreyi	7	71.4	WA	NL
Hydrovatus parallelus	8	50.0	QLD, WA	NL
Necterosoma darwini	8	62.5	WA	NL
Rhantaticus congestus	8	50.0	NSW, NT, QLD, WA	NL
Limbodessus inornatus	9	77.8	WA	NL
Necterosoma regulare	9	33.3	NSW, NT, QLD, WA	NL

Removal of extinct and poorly recorded species leaves 1668 records in ANHAT for 50 species (and subspecies). The mean number of records per species for species with greater than five records was 33.4, with a mean of 33.2 for the percent of records in the NRS.

Six species of Dytiscidae had 45% or greater of individual site records located within PAs (**Table 78**).

Table 78. Dytiscidae species with >45% of site records within the NRS.

Species	No. Records	Records in NRS	% in NRS	Location	Veg type	EPBC status
Antiporus femoralis	15	7	46.7	ACT, NSW, SA, TAS, VIC, WA		NL
Laccophilus sharpi	29	14	48.3	NT, QLD, WA		NL
Hydrovatus nigrita	12	6	50.0	NSW, NT, QLD		NL
Copelatus irregularis	46	23	50.0	NT, QLD, WA		NL
Cybister tripunctatus	17	9	52.9	NSW, NT, QLD, SA,		NL

				WA	
Copelatus divisus	22	15	68.2	QLD	NL

No Dytiscidae species had less than 10% of ANHAT records located within PAs.

No Dytiscidae species had records in more than 100 separate reserves.

A total of 31 species had records in five or fewer PAs (**Table 79**). No species were listed as threatened. All species in this list had fewer than 100 individual site records, and no species had more than 49 site records. The same 31 species of Dytiscidae had records in five or fewer PAs greater than 1000 hectares (**Table 79**).

Table 79. Dytiscidae species recorded from five or fewer PAs and in five or fewer PAs greater than 1000 hectares.

Species	No. Records	No. PAs	No. PAs >1000ha	EPBC status
Copelatus bakewelli	11	1	1	NL
Limbodessus shuckardii	12	2	1	NL
Megaporus nativigi	11	2	2	NL
Hydaticus daemeli	12	2	2	NL
Sternopriscus hansardii	12	2	2	NL
Hyphydrus contiguus	16	2	2	NL
Hydroglyphus trifasciatus	20	2	2	NL
Antiporus gilbertii	18	3	2	NL
Hydrovatus nigrita	12	3	3	NL
Sternopriscus multimaculatus	12	3	3	NL
Copelatus marginatus	13	3	3	NL
Megaporus howittii	14	3	3	NL
Hydroglyphus leai	16	3	3	NL
Laccophilus walkeri	16	3	3	NL
Eretes australis	22	3	3	NL
Antiporus femoralis	15	4	3	NL
Necterosoma undecimlineatum	23	4	3	NL
Hyphydrus effeminatus	11	4	4	NL
Hydroglyphus mastersii	15	4	4	NL
Copelatus divisus	22	4	4	NL
Hydaticus bihamatus	22	4	4	NL
Clypeodytes bifasciatus	24	4	4	NL
Hydaticus vittatus	33	4	4	NL
Copelatus nigrolineatus	46	4	4	NL
Hyphydrus elegans	19	5	4	NL
Hydrovatus fasciatus	38	5	4	NL
Platynectes decempunctatus	38	5	4	NL
Copelatus clarki	39	5	4	NL
Hydroglyphus grammopterus	20	5	5	NL
Laccophilus clarki	47	5	5	NL
Bidessodes mjobergi	49	5	5	NL

Final Discussion

The results obtained for vertebrates provide somewhat mixed results in regards to their reservation status. Many species in each vertebrate group remain with relatively few (<30) records in the ANHAT database. These species are difficult to assess in regards to their status or their habitat associations, especially with many species having fewer than 15 records. These species should be targeted with surveys to increase our understanding of their distributions within the National Reserve System.

Interestingly, those vertebrate species with more than 30 records tend to have relatively higher proportions of records falling into reserves, based on chance, being well above 11.6% and there are relatively few from any of the four groups that have poor representation in the reserve system. In fact, only nine species of vertebrate have no records in the NRS. Why is this so? The most obvious explanation is that vertebrates are relatively well surveyed for and efforts in data collection may have been biased towards protected lands, leading to an overabundance of records in protected lands. This is likely to be the case in regards to the major regional surveys undertaken to develop the regional forest agreements of the late 1990s. These relatively intensive surveys covered already reserved lands and, in particular, concentrated most effort in forest areas that were considered to be of high conservation value and were subsequently generally added to the reserve system. So, there is likely to be a bias for this reason, but this itself provides an indication that the NRS is providing an important element in the protection of most species. Most species do have many records in the NRS and so have many individuals being protected by it. If the reserve system covers an adequate and representative selection of all Australian vegetation types and is connected sufficiently to allow species to migrate across it, then it should provide very good protection for most vertebrate species into the long-term.

The invertebrates provide a more difficult picture to interpret. There are many species with very few records available and, in fact, it is a rarity for an invertebrate to have more than 100 records in the ANHAT database. Hence, most invertebrates are not able to be considered in regards to their reservation status. Furthermore, their true ranges in Australia and habitat requirements cannot be simply judged and so their conservation very difficult to undertake. It is very difficult to protect something when it is unknown where it occurs or what it requires to survive when it is actually known to be present. Of those species with greater than 10 records, very few spiders have higher percentages of records in reserves. This is likely because they are secretive in nature and records would often come from individuals collected by members of the public and handed to museums and so come from residential areas. Dragonflies and damselflies have somewhat more species with higher reservation rates, probably because they are easily identified in a normal survey and can be recorded relatively opportunistically. There are a number of land snails also with relatively greater levels of reservation. This is explained by the very narrow ranges of many land species. If a species has large parts of its range restricted to reserve areas, it is almost certain to lead to higher percentages of records within reserves. Nevertheless, the overall poor documentation and recording of invertebrates strongly suggests that surveys of the invertebrates within the NRS are urgently required in order to develop a much clearer picture of their relative representation within this system and so the relative conservation value of this system for these taxa.

The findings of the studies of species being found in large or small numbers of reserves provide simple results. Species present in larger numbers of reserves in the NRS are those that are mobile and/or have large ranges. Hence, they are present in or able to easily move through large areas of land and be present in many reserves. Birds and bats are very good examples, having larger numbers of species in many reserves because they move over large areas. On the other hand, the invertebrates provide the major numbers or species present in very few reserves. Many species have very small ranges and the non-flying terrestrial species are relatively immobile. Hence, they are not likely to cover large areas and so can not be present within larger numbers of reserves. Many land snails have very small distributional ranges, having evolved in specific rocky ranges and so will never be represented in many reserves. However, they can be highly reserved if their limited area of habitat is protected.

One of the encouraging results of this study was that nearly all species of all 11 studied groups are found in more than one protected area and that, where a species is found in only a very few protected areas, these are generally areas greater than 1000 ha in size. Larger areas are less prone to edge effects and will usually contain a greater diversity of sites and larger populations, making these populations more robust to stochastic events and have larger genetic pools for evolutionary development. One thousand hectares was chosen as the cut-off size for a larger reserve based on its use for the same purpose by Rodrigues et al 2004. They used this as a minimum effective size for a reserve for a number of taxa. It is not specifically clear that 1000 ha is a suitable size to maintain any specific population over the long-term, but such an area seems likely to provide a significant area of habitat for smaller, relatively immobile species, allowing them to maintain relatively large numbers of individuals. Smaller areas have been found to maintain populations within fragmented landscapes with Drinnan (2005) finding 3.5 ha to be a useful reserve size threshold and, more importantly, patches greater than 50 ha were able to maintain forest interior species and species that were sensitive to human disturbances. Tocher et al (1997) also found no obvious loss of frogs in fragments much smaller than 1000 ha. This suggests that 1000 ha is likely to provide a substantial area of habitat in which to conserve populations of any of the terrestrial invertebrates and the smaller terrestrial vertebrates. They are not necessarily sufficiently large for species that fly or the more mobile vertebrates. Furthermore, we point out that fragmentation of the remaining native vegetation through land clearing remains a serious threat as it will isolate even larger areas of retained land and can render 1000 ha or larger reserves of little value for all but the smallest species over the very long term.

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Data acknowledgements

The ANHAT data used for this report comes from authoritative sources, but these sources are not perfect. All species names have been confirmed as valid species names, but it is not possible to confirm all species locations. The summary summarises the input data, so errors found in the original data would also be reflected in this report.

The scientific names and taxonomic concepts used in this report reflect an ANHAT view of the data and not necessarily that found in government censuses, databases or other authoritative lists.

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Council of Heads of Australian Faunal Collections (CHAFC)

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- Australian Museum
- CSIRO Australian National Insect Collection
- Museum and Art Gallery of the Northern Territory
- Museum Victoria
- Queen Victoria Museum and Art Gallery (Launceston)
- Queensland Museum
- South Australian Museum
- Tasmanian Museum and Art Gallery (Hobart)
- Western Australian Museum

The taxonomic concepts used in this report reflect an ANHAT view of the data and not necessarily that of the CHAFC parent fauna collections.

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- Australian National Herbarium (CANB)
- National Herbarium of New South Wales (NSW) Botanic Gardens Trust
- Herbarium of the Northern Territory (DNA, NT)

- Queensland Herbarium (BRI)
- State Herbarium of South Australia (AD)
- Tasmanian Herbarium (HO)
- National Herbarium of Victoria (MEL) Royal Botanic Gardens Melbourne
- Western Australian Herbarium (PERTH).

The taxonomic concepts used in this report reflect an ANHAT view of the data and not necessarily that of the AVH parent herbaria.

Other Government Organisations

- Commonwealth Department of Defence
- Commonwealth Department of the Environment, Water, Heritage and the Arts
- New South Wales - Department of Environment, Climate Change and Water
- New South Wales - Department of Industry and Investment (Forests NSW)
- Northern Territory - Department of Natural Resources, Environment, the Arts and Sport
- Queensland – Department of Environment and Resource Management (WildNet)
- South Australia - Department for Environment and Heritage (Biological Survey of South Australia Database)
- Tasmania - Department of Primary Industries, Parks, Water and Environment (Natural Values Atlas)
- Victoria - Department of Sustainability and Environment
- Western Australia - Department of Environment and Conservation

Non-government

- Birds Australia
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Appendix 1 Vertebrate summary

Taxa	%Species >45% records in reserves	% Species in >100 PAs	% Species in >100 large PAs	%Species <10% records in reserves	% Species in <5 PAs	% Species in <5 large PAs
Anurans	36.09	11.24	7.69	10.65	14.20	13.02
Mammals	25.21	23.55	19.83	3.31	15.29	16.12
Reptiles	21.24	10.36	7.60	7.94	19.52	20.55
Non-passerines	4.82	68.67	58.63	5.22	2.81	2.81
Passerines	15.11	53.70	49.20	4.18	4.50	5.79

Taxa	No. Species >30 records	Total No. Records >30 records	Total No. Records in NRS >30 records	Mean No. records/species	No. Species <30 records	Average % in NRS	No. species less than 10%	No. Species more than 45%	No. species more than 100 reserves	No. species more than 100 Large reserves	No. Species in 5 reserves	No. of species in 5 or less large reserves
Anurans	169	95967	25501	567.85	41	37.86	18	36	19	16	24	22
Mammals	242	412781	130928	1705.71	36	35.84	8	61	57	48	37	39
Reptiles	579	325282	104611	561.8	212	32.43	46	123	60	44	113	119
Non-Passerines	282	3564629	616902	14315.78	3	22.61	13	12	171	146	7	7
Passerines	311	4970597	1032509	15982.63	10	28.93	13	47	167	153	14	18

Appendix 2 Invertebrate summary

Taxa	No. Species	No. Records	No. species >10 records	No records >10	Mean Records per species(>10)	No. species <=10 records	No records <=10	%of species <=10r	No. Records in NRS	% total in NRS	Mean % in NRS	No. Species >45% in NRS	% spp. >45% in NRS	No. Species <10% in NRS	% sp <10%
Odonata	283	9751	168	9227	55	115	524	18.91	2440	26.44	28.9	38	22.62	30	17.86
Lepidoptera	442	53246	362	52914	146.17	80	332	18.14	12178	23.01	24.4	46	12.71	49	13.54
Pulmonata	1914	43124	727	38702	53.2	1187	4422	62.02	11105	28.69	30.6	178	24.48	159	21.87
Mygalomorphae	609	9009	128	7703	60.2	481	1306	78.98	1134	14.72	23	22	17.19	49	38.28
Sparassidae	116	1162	30	889	29.6	86	273	74.14	216	24.30	28	6	20.00	7	23.33
Carabidae	1203	5582	204	6537	32	999	3032	83.04	2877	44.01	37.2	74	36.27	49	24.02
Dytiscidae	123	1888	50	1668	33.4	73	220	57.94	545	32.67	33.2	6	12.00	0	0.00

Taxa	No. Sp >100 Reserves	No species more than 100 Large reserves	No Species in 5 reserves	No of species in 5 or less large reserves	Well Reserved	Well Represented	Represented Large reserves	Poorly Reserved	Poorly Represented	Poorly represented in large reserves
Odonata	0	0	90	89	22.62	0.00	0.00	17.86	53.57	52.98
Lepidoptera	3	1	130	136	12.71	0.83	0.28	13.54	35.91	37.57
Pulmonata	0	0	402	423	24.48	0.00	0.00	21.87	55.30	58.18
Mygalomorphae	0	0	61	65	17.19	0.00	0.00	38.28	47.66	50.78
Sparassidae	0	0	13	14	20.00	0.00	0.00	23.33	43.33	46.67
Carabidae	0	0	130	132	36.27	0.00	0.00	24.02	63.73	64.71
Dytiscidae	0	0	31	31	12.00	0.00	0.00	0.00	62.00	62.00