# Rungulla, Queensland 2022: Bush Blitz expedition report

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**Contributors**

Bush Blitz is coordinated by Parks Australia, which is part of the Australian Government Department of Climate Change, Energy, the Environment and Water. The program is a partnership between the Australian Government, BHP and Earthwatch Australia.

Research agencies involved in this Bush Blitz were the Australian Tropical Herbarium, the Queensland Herbarium, the Queensland Museum and the University of New South Wales.

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**Acknowledgements**

Bush Blitz acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures, and to their Elders both past and present.

Bush Blitz would like to thank the Ewamian Elders – JR Richards, Ken Georgetown and Barry Fisher – for welcoming Bush Blitz participants onto their land and sharing their knowledge and cultural insights.

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# Summary

From 2 to 13 May 2022, Bush Blitz led an expedition to Rungulla National Park and Resources Reserve (Rungulla) in northern Queensland.

Surveys and collections filled knowledge gaps, provided important material for future genetic and taxonomic studies, and extended the known ranges of species, adding some new records for Queensland.

At least 829 species were recorded during the Bush Blitz and 40 of those may be completely new to science (1 ant, 5 flies, 6 true bugs, 2 spiders, 22 mites, 4 fungi). Many unnamed or informal invertebrate taxa were collected. These may assist scientists to revise, compare and describe species in the future.

The team recorded 4 species listed as threatened under the Queensland *Nature Conservation Act 1992* – an endangered daisy (*Pluchea punctata*) and 3 vulnerable shrubs (*Drummondita calida*, *Kardomia squarrulosa* and *Solanum carduiforme*).

Fifteen introduced and pest animal species were recorded, along with 14 weed species.

Highlights of the expedition include:

- identifying several new host parasite infections in blood samples taken from birds, including the first record of *Haemoproteus* infection in a Rainbow Bee-eater
- collecting tissue samples from reptiles found at the edges of their known ranges – these will be particularly valuable for future taxonomic research
- recording a micro-bee fly from the genus *Empidideicus*, not currently recorded for Australia
- discovering 3 new Australian genera of flat mites, reinforcing Australia's place at the world centre of flat mite diversity
- recording several plant species of conservation significance for the first time at Rungulla
- collecting valuable specimens of 2 grasses at the same sites (*Triodia microstachya* and a related undescribed species), which helped confirm they are different species
- rediscovering, after nearly 50 years, the fungus *Campylomyces tabacinus*, a specialist on the bark of living *Eucalyptus* trees.

# Introduction

## About Bush Blitz

The Bush Blitz program documents plants and animals in selected properties across Australia to support the discovery of new species, complement and complete existing collections, and provide information to support land management and conservation.

Bush Blitz is an initiative of the Australian Government, through Parks Australia, in partnership with BHP and Earthwatch Australia. This innovative partnership harnesses the expertise of many of Australia's top scientists from museums, herbaria, universities, and other institutions and organisations across the country.

An estimated 580,000 to 680,000 species are found in Australia (Chapman 2009), but three-quarters of this biodiversity is yet to be identified. Around 45% of continental Australia and over 90% of our marine area have never been comprehensively surveyed by scientists. Increasing our understanding of Australia's biodiversity is critical for conservation, biosecurity, agriculture, human and animal health and many other activities.

Since the Bush Blitz program began in 2010, more than 1,900 species have been discovered during Bush Blitz expeditions across Australia.

In addition to species discovery, Bush Blitz objectives include raising public awareness of biodiversity, and improving environmental, social and educational outcomes for local and Indigenous communities. While some of these objectives are met during expeditions – through Bush Blitz TeachLive, teacher workshops and community days – they are out of scope for this report.

## About this report

This report summarises the initial scientific findings of an expedition to Rungulla National Park and Resources Reserve (Rungulla) in northern Queensland. Information in this report has been extracted from the scientific reports provided by expedition members. Locational data for all flora and fauna records have been provided to land managers. Unless these data are considered sensitive, they will be publicly available through the Atlas of Living Australia (ALA).

## Rungulla Bush Blitz

Bush Blitz led an expedition to Rungulla from 2 to 13 May 2022, to collect and record plants, animals, fungi and other organisms living there.

Rungulla is approximately 350 km west of Townsville (490 km by road), on the lands of the Ewamian (pronounced Oor-a-min) people, who have an ongoing connection with Country. The area contains rugged sandstone country, dissected by the Gilbert River, and straddles 2 important bioregions - the Gulf Plains and Einasleigh Uplands.

Following the purchase of several grazing properties, Rungulla National Park was declared in 2015 to conserve unique cultural and natural values. It is 118,500 hectares in size, and the adjoining Resources Reserve covers a further 11,007 hectares. Queensland Parks and Wildlife Service (QPWS) works collaboratively with Ewamian Aboriginal Corporation to conserve

Rungulla's key values. Rungulla's Management Statement (State of Queensland 2020) identifies 4 key values – Ewamian Culture and Connection to Country, woodlands with perennial grasses, wetlands and the sandstone landscape.

Woodlands with perennial grasses are regional ecosystems 'of concern'. They also provide potential habitat for a number of conservation significant species including Koala (*Phascolarctos cinereus*), Northern Quoll (*Dasyurus hallucatus*), Gouldian finch (*Chloebia gouldiae*) and the Black-throated Finch (*Poephila cincta*).

Rungulla has significant wetlands, especially springs feeding the headwaters of several creeks and streams, sedge lagoons on plateau surfaces, and riverine areas. The Gilbert River is the main waterway through Rungulla. These wetland and waterway areas contribute to biodiversity and provide habitat for species of conservation significance, including nationally recognised migratory birds and the nationally vulnerable Sawfish (*Pristis pristis*).

As it was only relatively recently protected, few biodiversity surveys have been undertaken in Rungulla. The opportunity to undertake surveys in this remote, inaccessible region, aided by a helicopter, was highly valued by the institutions involved.

Rungulla's climate is typical of the seasonal wet–dry tropics of northern Australia. Most rain falls in summer, so little rain was expected during the May expedition. However, 3 days of unseasonal heavy rainfall impacted access to sites and collection success for animals such as microbats and smaller ground-dwelling mammals. On the other hand, the rain allowed the collection of many fungi species that would have otherwise been undetected.

## Previous surveys and pre-trip expectations

### Fauna

Prior to this expedition, mammal records were mainly of the larger, more prominent species like kangaroos. Koalas were recorded in the 1980s and only one microbat had been recorded from the area. Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*) had been previously collected, and was targeted, along with other native rodent species.

A core group of fairly common and easily observed bird species were known from the region but it was hoped that additional species would be recorded. In particular, the team hoped to find species of conservation interest that are historically known from nearby, such as Black-throated and Gouldian finches. They also expected some potentially interesting observations of closely related forms, representatives of certain bird families not previously documented for the region, and other species of diverse under-represented groups that can move across landscapes with patchy resources.

Blood parasites that infect Australian native birds have also been relatively understudied, with only a few, primarily coastal, studies in Queensland. Due to the inland location, close to the meeting point of several bioregions, the team expected to identify new blood parasites in previously unscreened hosts.

There were no museum vouchers of amphibians or reptiles from Rungulla, and Wildnet records of unvouchered sightings listed just 3 frog species and 19 reptiles. Given the diversity of habitats, and its positioning over 2 bioregions, the team expected to find additional species.

There had been few to no invertebrate surveys undertaken at Rungulla. There were no records of insects available through the ALA, apart from 2 observations of a single species of butterfly, the Common Crow, *Euploea corinna*. It was expected that this expedition would contribute substantially to the list of insect species from the park. Mid-May is typically a period of low activity and abundance of adult insects, so it was expected that collections would substantially underestimate the diversity of the park. However, the presence of a variety of aquatic habitats in the park, including permanent springs, suggested that dragonflies and damselflies might be more common than expected for an inland location.

There are over 2,500 species of true bugs (Heteroptera) in Australia, with over 400 new species described in the past 20 years. As there had been no known prior assessment of true bugs from Rungulla, there was an expectation that new species would be found, despite the fact that the expedition was taking place in the dry season.

Rungulla had not been surveyed for spiders before. However, small collections of larger spiders (Tarantulas, Theraphosidae) had been taken from nearby locations, including Georgetown.

There had been no previous collections of plant-associated mites at Rungulla, and only limited opportunistic collecting of mites across northern Queensland. Mites are an extremely understudied group in Australia, and the limited collecting undertaken so far has revealed a huge diversity of new taxa. It was difficult to predict what the mite diversity would be in an entirely unsurveyed region, but it was expected that most species collected would be new to science.

**Flora and funga**

The botanists focused on vascular plants and fungi. Fungi are more closely related to animals than plants but have historically been studied by botanists.

As there are few collections from this part of Queensland, any sampling would contribute to the overall state of knowledge for the area. However, some specific aims were:

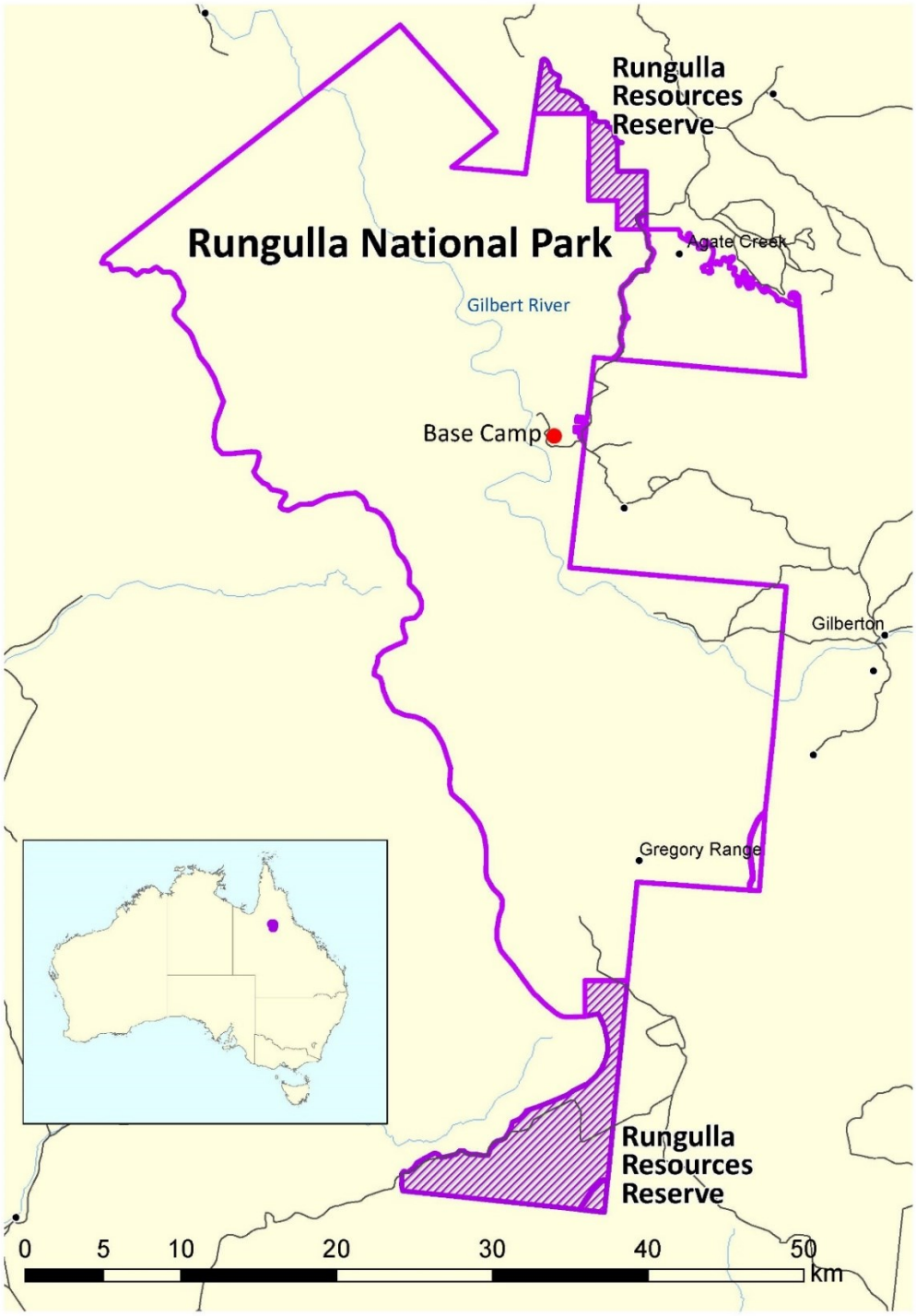
- better representation of sandstone flora, with a focus on areas with potential for new species or records for Rungulla
- targeted collections from geographic extremities of Rungulla, inaccessible without a helicopter
- additional sampling in previously uncollected spring and lake habitats
- targeted and opportunistic collection of fungi
- resolution of the identity of the mallee eucalypt (currently called *Eucalyptus ammophila*) previously collected at Rungulla
- additional sampling in regional ecosystems identified as a priority for site data collection to help define the limits of vegetation communities.

# Study area

The study area included Rungulla National Park and Rungulla Resources Reserve. Map 1 shows the park and reserve boundaries, the expedition base camp near the centre of the park and the Gilbert River running through the park. A few other locations have also been shown – Agate

Creek, a homestead at the northeast end of the park, Gilberton, a homestead just east of the park, and Gregory Range, a place at the southern end of the park.

**Map 1 Locations visited, 2 to 13 May 2022**




Note: For a map of collection sites see Appendix B.

# Expedition team

## Logistics

Bush Blitz provided the logistical coordination and overall leadership for the expedition. The Bush Blitz team consisted of Helen Cross and Courtney Webber.

The QPWS Dry Tropics ranger team provided valuable assistance with planning and on-ground support throughout the expedition. The team consisted of Senior Ranger Nick Smith, Resource Ranger Ian Holloway, Ranger-in-Charge (Bulleringa) Luke Parnell, and Rangers Roy Mortensen, Harold Turpin, Brendan Nasser and Alexandra Lacey.

## Scientific

The Australian Tropical Herbarium, the Queensland Museum (QM) and the Queensland Herbarium were the host institutions for this expedition, providing the core group of personnel and accessioning the specimens into their collections. A PhD candidate from the University of New South Wales (UNSW) also conducted field and laboratory work and is included in Table 1.

In addition, a TERN (Terrestrial Ecosystem Research Network) field team attended the first week of the expedition. The TERN Ecosystem Surveillance platform conducts field surveys and sampling across a national network of plots and transects to provide the data, samples, advice and mapping needed for improved monitoring and assessment of Australia's major ecosystems. The team set up 2 one-hectare monitoring plots during the expedition and returned a few weeks later to complete the sampling. These plots contribute to the network of almost 1,000 long-term ecological monitoring plots across Australia. Data collected by TERN are not included in this report. However, a report on TERN Ecosystem Surveillance on the expedition is available.

## BHP participants and Bush Blitz TeachLive

Sabrina Trocini and Jock Mackenzie (Earthwatch Australia) coordinated 4 teachers and 2 BHP employees who assisted scientists in the field.

Bush Blitz TeachLive is a collaborative program between the Bush Blitz partners and the Australian Science Teachers Association. Due to the COVID-19 pandemic, only Queensland teachers were invited to apply. Sabrina Trocini and Jock Mackenzie from Earthwatch Australia coordinated the TeachLive activities for the 4 teachers – Louise Edwards (Yeronga State High School), Monica Lilley (Rainworth State School), Janet Price (Northgate State School) and Michael Tubby (Woodridge State High School).

Working alongside scientists, the teachers reinvigorated their love for science, generated new ideas and learned new skills to take back to their schools. Teachers taught 'live' to their classrooms via the TeachLive website and videoconferencing, taking their students on a virtual expedition and inspiring the next generation.

BHP environmental specialists on the expedition were Daniel Lachenicht and Katherine Taske. They also worked alongside the scientific team to share knowledge and improve linkages between botanical and zoological experts and BHP.

**Figure 1 Some members of the expedition team**


Photograph: © Copyright, Bush Blitz.

# Methods

## Taxonomic groups studied and personnel

A number of taxonomic groups were selected as targets for study. Table 1 lists the groups surveyed and the personnel who undertook the fieldwork, made identifications and reported on the findings.

**Table 1 Taxonomic groups surveyed and personnel**

| Group | Common name | Personnel and affiliation |
|---|---|---|
| Mammalia and Aves | Mammals and birds | Heather Janetzki (QM)<br>Will Goulding (QM) |
| Reptilia and Amphibia | Reptiles and Frogs | Andrew Amey (QM) |
| Hymentoptera<br>Lepidoptera<br>Odonata | Ants, wasps and bees<br>Butterflies and moths<br>Dragonflies and damselflies | Chris Burwell (QM) |
| Hemiptera | True bugs | Zoe Bloesch (UNSW) |
| Diptera: Syrphidae | Hover flies | Susan Wright (QM) |
| Therevidae and Bombyliidae | Stiletto flies and bee flies | Christine Lambkin (QM) |
| Arachnida | Spiders | Robert J Raven (QM) |
| | Mites | Jenny Beard (QM) |
| Flora and funga | Vascular plants, fungi and vegetation communities | Matt Barrett (Australian Tropical Herbarium)<br>Tony Bean (Queensland Herbarium)<br>Nicholas Cuff (Australian Tropical Herbarium, Queensland Herbarium)<br>Gerry Turpin (Australian Tropical Herbarium, Queensland Herbarium) |

Other personnel, including but not limited to Geoff Monteith (QM), Gerry Cassis (UNSW), Greg Daniels (QM), Judy King (QM) and Peter Allsopp (QM), assisted with making identifications and reporting. These personnel and their roles are mentioned in the scientific reports.

## Site selection and collection methods

All scientific teams surveyed 2 standard survey sites, selected to represent different habitat types. The use of standard survey sites provides a unique opportunity to examine broad-spectrum biodiversity. Among other benefits, it allows land managers to use these sites for ongoing monitoring and generates a national dataset that can be used to underpin conservation and land management decisions.

Following consultation with Traditional Owners and rangers, the standard survey sites were established close to the ranger station to allow easy access during and after the expedition. Each standard survey site was centred on a point (permanently marked), but the actual area surveyed varied between taxa. Standard methodologies were used to sample these sites.

Apart from standard survey sites, site selection and collection methods were left to the discretion of the individual scientists, with guidance from Traditional Owners and rangers.

When selecting sites, they usually prioritised areas that were under-surveyed and had high potential for new or significant discoveries. Some teams aimed to cover a wide range of habitats and the widest geographic range possible in the time available. Other considerations included access, the findings of previous surveys, habitat type and diversity, and the preferences or requirements of target species – for example, the presence of particular plant species, hill tops or fresh water.

Prior to the expedition, Bush Blitz consulted with the Ewamian Aboriginal Corporation and QPWS rangers about their priorities, the quality of different habitats on the ground, logistical challenges regarding access to sites and cultural considerations. In the field, Ewamian Traditional Owners and rangers led and accompanied scientific teams in vehicles and the helicopter, so that knowledge about sites could be shared.

Site locations were recorded using global positioning systems. Specific details about site selection and collection methods can be found in the scientific reports.

## Identification and curation

The specimens taken were identified using the holdings of museums and herbaria and available literature (references are provided in the scientific reports).

Fauna specimens will be deposited at the Queensland Museum, with the exception of Heteroptera that will be accessioned into the UNSW entomology collection. Vascular plants and fungi will be deposited at the Australian Tropical Herbarium and the Queensland Herbarium.

# Results

## Summary of records

Preliminary results indicate that at least 829 species were recorded during the expedition, including approximately 40 putative new species – these await formal identification. Four threatened plant species, 15 introduced and pest animal species and 14 weed species were also recorded.

Table 2 provides a summary of the fauna, flora and funga records made on the expedition.

**Table 2 Summary of fauna, flora and funga records**

| Group | Common name | Total species recorded | Putative new species | Threatened species | Introduced and pest species |
|---|---|---|---|---|---|
| Mammalia | Mammals | 14 | 0 | 0 | 3 |
| Aves | Birds | 73 | 0 | 0 | 0 |
| Reptilia | Reptiles | 25 | 0 | 0 | 0 |
| Amphibia | Frogs and toads | 4 | 0 | 0 | 1 |
| Hymenoptera | Ants | 91 | 1 | 0 | 2 |
| | Bees | 16 | 0 | 0 | 1 |
| | Wasps | 6 | 0 | 0 | 0 |
| Lepidoptera | Butterflies | 31 | 0 | 0 | 0 |
| | Moths | 4 | 0 | 0 | 0 |
| Odonata | Dragonflies and damselflies | 29 | 0 | 0 | 0 |
| Diptera | Flies | 36 | 5 | 0 | 0 |
| Coleoptera | Beetles | 13 | 0 | 0 | 6 |
| Hemiptera | True bugs | 58 | 6 | 0 | 0 |
| | Cicadas | 1 | 0 | 0 | 0 |
| Blattodea | Cockroaches | 1 | 0 | 0 | 0 |
| Orthoptera | Grasshoppers, crickets, katydids | 1 | 0 | 0 | 0 |
| Arachnida | Spiders | 97 | 2 | 0 | 2 |
| | Mites | 35 | 22 | 0 | 0 |
| Plantae | Vascular plants | 253 | 0 | 4 | 13 |
| | Mosses | 2 | 0 | 0 | 0 |
| Fungi | Fungi | 39 | 4 | 0 | 1 |
| **Total** | | **829** | **40** | **4** | **29** |

Note: Threatened species include those listed as threatened under the Commonwealth EPBC Act or an equivalent listing under the *Nature Conservation Act 1992* (Queensland). Introduced and pest species may include species that are native to Australia.

## Species lists

Lists of all flora, fauna and funga species recorded during the expedition (Appendix A) were compiled using data from participating institutions. Additional ant species may be present in

unprocessed material. The single-celled blood parasites that were recorded in blood samples from birds have not been listed.

Some specimens were only able to be identified to family or genus level. This is partly because identification of specimens is very time-consuming, with detailed microscopic examination needed in many cases. Some groups are also 'orphans' – currently no experts are working on them or are available to work on them and the taxonomic literature is out of date. Species-level identification is therefore not possible for these groups.

In the case of spiders and mites, species-level identification was not possible when the required sex was not collected, or when only immature specimens were collected. Microbats were recorded but could not be identified due to limited call references (for acoustic monitoring identification) for this region of Queensland, and the need to often have an animal in the hand to look closely at identifying characteristics.

Unidentified Bush Blitz specimens are held in institutional collections where they are available for future study. Collections hold many such specimens, among them species not yet described (unnamed species) as well as described species that have not yet been identified. For example, the Australian National Insect Collection holds tens of thousands of unidentified specimens. Specimens often wait decades before the resources become available for their study. A key component of Bush Blitz is the funding of taxonomic work on specimens collected during Bush Blitz expeditions.

Nomenclature and taxonomic concepts used in this report are consistent with the Australian Faunal Directory, World Spider Catalogue and Key to Spider Subfamilies of Australia, Australian Plant Name Index, Australian Plant Census, Catalogue of Australian Liverworts and Hornworts and the Australian Fungi List.

# Discussion

## Putative new species

Here we use the term 'putative new species' to mean an unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz. A putative new species is confirmed as a new species once it is named and its description is published.

Approximately 40 putative new species were discovered during the expedition. Further research may reveal additional new species in the material collected.

### Ants

Following the revision of Australian species of *Strumigenys* in 2000, Queensland Museum scientists are confident that 4 worker ants collected in pitfall traps at Standard Survey Site 1 (SSS1) are a new species (Figure 2). The new species is a member of the *Strumigenys emmae* group which, in Australia, contains 7 described species. The species found is most similar to *Strumigenys bibis*, which is known only from the unique holotype that was collected in the Northern Territory. The specimens collected at Rungulla have been compared with the description of *S. bibis,* as well as images of the holotype. The species differ in several ways.

**Figure 2 A putative new species of trap-jaw ant**

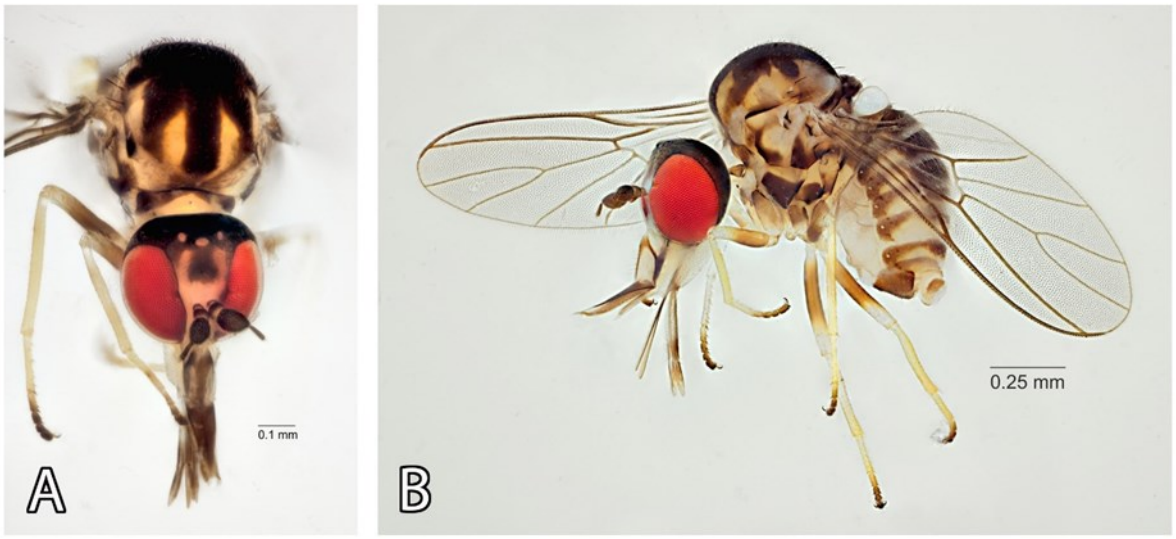

Photograph: © Copyright, Queensland Museum.

## Flies

There were 5 putative new species of fly collected during the expedition – 4 bee flies and one robber fly.

A new species of bee fly belonging to the genus *Empidideicus* was collected from Standard Survey Site 2 (Figure 3). This species belongs to a very rare group, with less than 20 specimens known worldwide, and is currently being described by Evenhuis and Lambkin.

**Figure 3 New species of *Empidideicus* bee fly**




Photograph: © Copyright, Queensland Museum.

The remaining 3 new species of bee fly are from a genus known as Genus B. Once the genus has been described, there is potential for these 3 new species to be described.

The new species of robber fly was collected on a hilltop 32 km from the QPWS shed. This *Ommatius* species belongs to a group of about 12 undescribed species distributed across northern Australia. Species of this particular group of robber flies are commonly found on bare slabs of rock. All other known Australian *Ommatius* species perch mainly on twigs, and rarely on grasses.

## True bugs

At least 6 putative new species of true bug were discovered during the expedition – 2 plant bugs (Miridae), 1 damsel bug (Nabidae) and 3 assassin bugs (Reduviidae).

The plant bugs included a new species of *Singhalesia* and a species from the tribe Zanchiini. There are currently no described species of Zanchiini in Australia. The damsel bug is a new species of *Phorticus*. There are many new Australian assassin bugs in the genus *Poecilosphodrus*, including the 3 collected on this expedition, one of which is shown in Figure 4.

**Figure 4 New species of assassin bug, *Poecilosphodrus* SP001 n.sp.**

Photograph: © Copyright, UNSW

## Spiders

At least 2 species of spider collected were previously unknown to science – *Matilda* sp. nov. and *Karaops* sp. nov. *Matilda* is a genus normally found in rainforests (or at least closed forests), so it was unusual to find this species under rocks on a dry mountaintop ridge.

Based on an assumption that many species are only found locally, and as there have been no previous collections in the area, there may be around 7 additional new species among the spiders collected.

## Mites

At least 22 new species of plant-associated mites were discovered – 17 flat mites (Tenuipalpidae), 4 predatory mites (Phytoseiidae) and 1 spider mite (Tetranychidae). Additional new species may be confirmed after further research. Keeping in mind that only 13 tiny sites were visited, and only 27 species of plant were sampled across an area of nearly 130,000 hectares, there could be thousands more new mite species waiting to be discovered.

Several of the new species and genera will be described using Bush Blitz taxonomy research funding. The new species include 3 flat mites that each belong in a new genus. Genus B BBRNP sp. 1 (Figure 5) is highly unusual in that the adult female is unable to move, confined within the accumulated skins of the immature stages.

**Figure 5 Flat mite Genus B BBRNP sp. 1**

Photograph: © Copyright, Queensland Museum.

## Fungi

There were 4 potentially new species of fungi identified.

An earthstar (*Geastrum* sp.) was found that looks different from other species in its genus. Only a single unopened specimen was found, and it is unclear whether it was immature, and would have matured into the typical earth-star-puffball form, or if the species remains as a truffle-like form to maturity. Although a full description is not possible based on this single specimen, DNA sequences do not match any known species, so it is likely to be new.

*Coltriciella* species form small brown fruit bodies with pores on the underside, usually on a short stem. Historically, most species have been considered part of a global species, *Coltriciella dependens*, but recent studies suggest there are many species, with *C. dependens* being a northern-temperate species. Taxonomy of these species requires global revision, and microscopic differences are subtle. Molecular phylogenetic analyses demonstrate that 2 species are present amongst the 4 specimens gathered at Rungulla, and that they differ from other molecular lineages obtained from Australia. Further investigation of the genus is needed before they can be formally recognised.

*Fomitiporia* species form hard, woody, brown brackets on the side of living and dead trees. Some are important pathogenic (disease-causing) species. A putative new species was collected from a fallen eucalypt branch, but it is unknown whether the fungus caused the branch to drop before fruiting on the dead branch. Molecular phylogenetic analyses show that the single Rungulla collection does not match any species described globally, nor any of the sequences obtained from elsewhere in Australia. Again, further research on the genus in Australia is needed before the new species can be formally named.

# Threatened species

Approximately 92% of Australian plants, 87% of mammals, 93% of reptiles and 45% of birds are endemic (Chapman 2009). Changes to the landscape resulting from human activity have put many of these unique species at risk. Over the last 200 years, many species have gone extinct; many others are considered to be threatened – that is, at risk of extinction.

Native species that are considered at risk of extinction are protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Queensland *Nature Conservation Act 1992* (NCA). Depending on the assessed level of risk, threatened species can be listed as critically endangered, endangered or vulnerable. Under the NCA, species can also be classified as near threatened or least concern. Species classified as least concern that are of particular management interest, may be designated as special least concern.

## Fauna

None of the animal species identified are threatened species under the EPBC Act or NCA. However, at least 2 species are of conservation significance.

Leaden-bellied Fine-lined Slider (*Lerista vanderduysi*) was found, resulting in a significant range extension. This burrowing skink was described in 2016 and is listed by the IUCN as Near Threatened. At Rungulla Bungles and Dutchmans Creek, 5 individuals were found by searching for less than half an hour at each site. The habitat found at these sites is widespread throughout Rungulla, suggesting the species is present in good numbers. Although this record is only slightly further northwest than previous records, for a species with a previously known range of less than 100 km$^2$, it is significant.

Australian tarantulas (family Theraphosidae) are listed as Least Concern in the NCA. A known but undescribed species of tarantula (*Selenotypus* sp.) was found at 3 sites (Figure 6). Valuable information about its burrow and genetic material were collected to support further ecological studies of this family.

**Figure 6 *Selenotypus* sp. nov., a small burrowing tarantula**

Photograph: © Copyright, Robert Raven

## Vascular plants

Of the 4 threatened (NCA) plant species recorded during the expedition (Table 3), one is a daisy and 3 are sub-shrubs or shrubs closely associated with sandstone habitats.

*Pluchea punctata* is a daisy endemic (native and restricted) to Rungulla. It was first described in 2011 and is currently only known from 2 collections at one location – on the road from Rungulla National Park to Forsyth. Previous estimates suggested a population size of 40 to 50 individuals. Targeted searches in apparently suitable habitat nearby did not find any new locations for the species. A basic census of population size and extent at the known location found between 100 and 300 individuals within an area of approximately 0.75 to 1 hectare. The plants were mostly large multi-stemmed adults.

*Kardomia squarrosa* was recorded at Rungulla for the first time (Figure 7), resulting in a significant range extension. It is an open spreading shrub to approximately 3 m tall with small white flowers clustered towards the tips of the branches. It is likely to be an 'obligate seeder' (that is, it only regenerates from seed sources) so finding this species suggests a relatively benign fire regime in comparison to most of Rungulla. This species was previously only known from White Mountains/Burra Range and the Just Range area to the west of Charters Towers. These collections from the southern section of Rungulla represent a range extension of around 213 km for the species. It is possible the species is present in habitat of a similar type and quality between the currently known locations. It is reasonable to assume that land management and genetic threats are of key significance to this species and, if addressed, could support the protection of the species.

**Figure 7 *Kardomia squarrulosa,* plant and detail of flower**

Photograph: © Copyright, M.D. Barrett

*Drummondita calida* is a dense shrub to approximately 4 m tall. Type material for the species was originally collected in the Gilbert River area in the 1860s. The range of *D. calida* encompasses a narrow corridor of suitable sandstone habitats between Buleringa National Park in the north and Gregory Range Station near Richmond in the south. The small area of occupancy, small population size, suspected poor genetic connectivity between populations and a number of threatening processes resulted in the species being listed as vulnerable under the NCA. *D. calida* was collected or recorded at a number of locations during this expedition, all of which were situated within the previously known extent of occurrence.

*Solanum carduiforme* is a clonal, erect, spiny herb or sub-shrub to around 1 m high. The species is currently listed as vulnerable under the NCA. It was previously listed under the EPBC Act but was delisted in 2013 as a result of new information regarding the distribution of the plant in Western Australia and the Northern Territory. *Solanum carduiforme* was previously known from 2 sites at Rungulla. It was recorded in the same area during this expedition although no specimens were collected given the sterile state and the existing collections from nearby. The species was locally common at sites where it was found on deeper sandy soils surrounding sandstone outcrops in gullies and valleys between the major plateau units. Vegetation was typically *Eucalyptus chartaboma* woodland with *Triodia microstachya* hummock grasslands and, given the size of hummocks, it is assumed that fire intervals in these areas may have been greater than in other parts of Rungulla.

Further information about these threatened species, and management of their sandstone habitats, are provided in the scientific report.

**Table 3 Threatened flora species**

| Family | Species | Status | Comments |
|---|---|---|---|
| Asteraceae | *Pluchea punctata* | Endangered (NCA) | 1 site; small localised population on narrow lower-slope adjacent to ephemeral drainage line |
| Myrtaceae | *Kardomia squarrulosa* | Vulnerable (NCA) | 3 sites; occasional along margins of gorge |
| Rutaceae | *Drummondita calida* | Vulnerable (NCA) | 4 sites; common in localised areas on sandstone |
| Solanaceae | *Solanum carduiforme* | Vulnerable (NCA) | Found at a number of locations |

In addition to the 4 threatened species, the botanists recorded 5 other species listed under the NCA – 2 Near Threatened species (*Labichea brassii* and *Leptospermum pallidum)* and 3 Special Least Concern species *(Blechnum orientale, Drosera burmanni* and *Stylidium tenerum*).

*Labichea brassii* is a shrub or sub-shrub to 3m tall. It was listed as Near Threatened due to its small population sizes, few locations and low area of occupancy. However, current estimates of the extent of occurrence and area of occupancy suggest it has an even more restricted range than previously thought, supporting a change of listing to a threatened category. This species was collected at a number of locations during the expedition, although all were within the currently known extent of occurence. Fire is likely to impact survival of the species, particularly in the longer term, due to climate change. The likelihood that this species is able to resprout after fire provides some level of resilience against these impacts.

None of the fungi recorded are considered rare or threatened. Even the species known from only a few (1–3) collections are probably widespread but in low abundance across northern Australia.

# Introduced and pest species

Conservation reserves help to protect Australia's rare and threatened ecosystems and provide refuge for species at risk. Invasive species can have a major impact on already vulnerable species and ecosystems, as well as economic, environmental and social impacts. The inclusion of

introduced and pest species records as part of this report is designed to provide land managers with baseline information to assist with further pest management programs.

## Vertebrates

Cane Toads were by far the most commonly encountered vertebrate in the park. Studies in other areas have shown dramatic impacts on predators such as quolls, goannas and even crocodiles. Although the abundance of Cane Toads is disappointing, it is not surprising in this region and there are limited options for effective control.

The nature of the landscape appears to restrict accessibility of cattle to some areas, and numbers have been greatly reduced. However, where cattle do occur their widespread grazing is likely to impact seed-eating, ground-foraging and nesting birds, as well as rodents. Their trampling also reduces seedling recruitment and can cause erosion. Water degradation from dung was evident when the river levels were reduced to smaller water holes.

The impact of rats on native wildlife in remote locations is not well documented. However, they affect wildlife through competition, predation, and the spreading of disease. These records are over 100 km from the next most easterly site. It is not known how far they have dispersed within the park, although they are highly mobile in areas of human interference.

Table 4 lists the introduced and pest vertebrate species recorded during the expedition.

**Table 4 Introduced and pest vertebrate species – mammals and amphibians**

| Family | Species | Common name | Comments |
|---|---|---|---|
| Bovidae | *Bos taurus* | Cattle | On road to Dead Horse Creek and evidence along Gilbert River; evident in more open country |
| Bufonidae | *Rhinella marina* | Cane Toad | Along Gilbert River and surrounding area; high presence in water sources along the river prior to rain; adults and tadpoles can impact native fauna |
| Leporidae | *Oryctolagus cuniculus* | Rabbit | Adjacent to and ENE of QPWS shed, SS1; frequently sighted |
| Muridae | *Rattus rattus* | Black Rat | Ridge adjacent to QPWS shed; multiple at site; while only located close to QPWS shed, a problematic species |

## Invertebrates

Table 5 lists the introduced and pest invertebrate species that were collected or observed in the study area – 2 ants, European Honey Bee (*Apis (Apis) mellifera*), 5 African dung beetles, 1 scarab beetle and 2 spiders.

Of the introduced ants, the Black Crazy Ant (*Paratrechina longicornis*) is of most concern but unlikely to pose a serious ecological threat. The native range of the Black Crazy Ant is uncertain but it is now found throughout the world's tropics. In Australia, it is widely distributed across the northern tropics and subtropics. It is typically associated with disturbed habitats such as agricultural, periurban and urban areas and rarely penetrates native forests. A small number of specimens were collected at Standard Survey Site 1 and on the south bank of the Gilbert River, 23 km from the QPWS shed.

The Difficult White-footed Ant (*Technomyrmex difficilis*) is a very widespread tramp ant species that is considered to be introduced to Australia. There are reliable records of the species from

northern coastal Queensland and the Top End of the Northern Territory. Ecological impacts of the species in Australia are not well known.

The dung beetle species recorded were deliberately introduced into Australia as part of a CSIRO-led project to help bury cattle dung. They pose no ecological risk.

**Table 5 Introduced and pest invertebrate species – ants, bees, beetles and spiders**

| Group | Family | Species | Common name | Comments |
|---|---|---|---|---|
| **Ants** | Formicidae | *Paratrechina longicornis* | Black Crazy Ant | Found at 2 sites; occurrence at the Gilbert River site is of some concern and follow up surveys using attractant baits are suggested |
| | Formicidae | *Technomyrmex difficilis* | Difficult White-footed Ant | Only recorded from SSS1; numerous workers collected from trail on one tree trunk at night and 2 workers collected in a Malaise trap |
| **Bees** | Apidae | *Apis (Apis) mellifera* | European Honey Bee | Abundance unknown |
| **Beetles** | Scarabaeidae | *Colpochila obesa* | na | 1 specimen from 1 site; larvae known to be pests of lawn grass; adults are implicated in feeding damage to eucalypt trees |
| | Scarabaeidae | *Digitonthophagus gazella* | na | 28 specimens from 3 sites; formerly *Onthophagus gazella*; native to Africa and introduced to Australia where it occurs in all mainland states except Victoria |
| | Scarabaeidae | *Euoniticellus intermedius* | na | 2 specimens from 2 sites; native to Africa and introduced to Australia, where it occurs in all mainland states except Victoria |
| | Scarabaeidae | *Liatongus militaris* | na | 5 specimens from 2 sites; native to Africa and introduced to Australia, where it occurs in northern parts of NT and eastern parts of Queensland |
| | Scarabaeidae | *Onitis viridulus* | na | 6 specimens from 2 sites; native to Africa and introduced to Australia, where it occurs in northern part of NT and eastern part of Queensland |
| | Scarabaeidae | *Sisyphus rubrus* | na | 1 specimen from 1 site; native to Africa and introduced to Australia where it occurs in eastern half of Queensland and the NE corner of NSW |
| **Spiders** | Oxyopidae | *Artema atlanta* | Giant Daddy long legs | Uncommon at base camp; imported in western areas on machinery |
| | Theridiidae | *Latrodectus hasseltii* | Redback Spider | Easily found at base camp; introduced from WA and SA in 19th Century |

**na** Not available

## Vascular plants and fungi

There were 14 introduced plant and fungi species recorded during the expedition, including 5 that had not been recorded at Rungulla before.

The majority of introduced species recorded are considered relatively minor economic, agricultural or environmental threats. However, there were new records for Rubber Vine

(*Cryptostegia grandiflora*) and American Rat's Tail Grass (*Sporobolus jacquemontii*). These are both listed as Category 3 Restricted Invasive Plants under the *Biosecurity Act 2014* (Queensland).

### Table 6 Gazetted weeds

| Family | Species | Common name | Comment |
|---|---|---|---|
| Apocynaceae | *Cryptostegia grandiflora* | Rubber Vine | New record; Weed of National Significance; River track, Rungulla National Park, S of Georgetown; present along watercourses |
| Poaceae | *Sporobolus jacquemontii* | American Rat's Tail Grass | New record; occasional; River track, Rungulla National Park, S of Georgetown |

**na** Not available.

Generally speaking, exotic plant density was low in the areas of Rungulla associated with the drier hills and plateaus. This most likely reflects both a lower likelihood of exotic animal traffic and less-favourable growing conditions.

Weed density was noticeably higher in areas with a comparatively higher availability of water and thus forage materials, such as along sections of Gilbert River and Six Mile Creek. Historical access for cattle along the Gilbert River is likely to have increased the abundance of exotic plant species found on the more favourable and well-watered alluvial soils adjacent to the river.

A single presumed introduced fungus, *Cyathus stercoreus*, was found on cattle dung. Given that it lives on dung, this species is not weedy, and probably provides beneficial ecological services decaying cattle dung. This was the first record of *C. stercoreus* at Rungulla.

### Table 7 Non-gazetted weeds

| Family | Species | Common name | Comment |
|---|---|---|---|
| Asteraceae | *Acanthospermum hispidum* | Star Burr | Occasional; River track, Rungulla National Park, S of Georgetown |
| Fabaceae | *Senna occidentalis* | Coffee Senna | Occasional; River track, Rungulla National Park, S of Georgetown |
| Lamiaceae | *Mesosphaerum suaveolens* | Hyptis | Occasional; 0.4 km E of ranger station, Rungulla National Park, S of Georgetown (SSS1); present around infrastructure and high visitation areas |
| Lamiaceae | *Salvia misella* | na | New record; occasional; River track, Rungulla National Park, S of Georgetown |
| Malvaceae | *Sida acuta* | na | Occasional; Rungulla National Park, approximately 1 km north of Rungulla airstrip |
| Malvaceae | *Sida cordifolia* | Flannel Weed | Occasional; 0.4 km E of ranger station, Rungulla National Park, S of Georgetown (SSS1) |
| Malvaceae | *Triumfetta pentandra* | na | 0.4 km E of ranger station, Rungulla National Park, S of Georgetown (SSS1) |
| Nidulariaceae | *Cyathus stercoreus* | na | FUNGUS; new record; near airstrip, Rungulla National Park; only 1 seen, but likely widespread |
| Plantaginaceae | *Scoparia dulcis* | na | Occasional; Mushroom Rock, near River track, Rungulla National Park, S of Georgetown |

| Family | Species | Common name | Comment |
|---|---|---|---|
| Portulacaceae | *Portulaca pilosa* | na | A weedy species now widespread in tropical and subtropical Australia; a succulent herb that rarely dominates; of minor significance and does not require control efforts |
| Rubiaceae | *Richardia scabra* | na | New record; occasional; River track, Rungulla National Park, S of Georgetown |
| Solanaceae | *Datura ferox* | Thorn Apple | Occasional; River track, Rungulla National Park, S of Georgetown |

**na** Not available.

# Range extensions

The known ranges of many species were extended, including new records for Queensland. The most notable range extensions are listed in Table 8.

Prior to this expedition there were no records from Rungulla for many of the invertebrate groups targeted, so the majority of species were new records. Most of the species are within their known distributions, but a few represent range extensions or interesting records. Most range extensions were minor to moderate inland range extensions around the latitude of Rungulla, demonstrating the park's importance as habitat for more coastally distributed species.

Approximately 170 of the plant species recorded were new records for Rungulla, although many had been recorded not far outside the boundaries. There were numerous range extensions and infilling of distribution information for a number of species.

Since there were no previous fungal records for Rungulla, all 39 species of fungi collected were new records. A number of the collections represent undescribed species, previously known to be widespread in northern Australia. The new collections provide significant range extensions, helping to plot their distribution, and will contribute toward their naming and characterisation.

### Table 8 Range extensions

| Group | Family | Species | Comments |
|---|---|---|---|
| **Reptiles** | Diplodactylidae | Silver-eyed Velvet Gecko (*Oedura argentea*) | 30 km; slightly further S than previous records of this recently described species |
| | Scincidae | Major Skink (*Bellatorias frerei*) | 100 km; primarily occurs coastally, this record is slightly further W than any other museum records |
| | Scincidae | Schmeltz's Rainbow Skink (*Carlia schmeltzii*) | 70 km; primarily occurs coastally, this record is slightly further W than any other museum records |
| | Scincidae | Leaden-bellied Fine-lined Slider (*Lerista vanderduysi*) | 40 km; slightly further NW than previous records and a significant extension |
| **Ants** | Formicidae | *Chelaner bifidum* (formerly *Monomorium bidfidum*) | 285 km; significant infill of range; only other Qld record from near Dimbulah; otherwise known from Top End of NT and far NE of WA |
| | Formicidae | *Dolichoderus scrobiculatus* | 270 km; inland range extension at that latitude |
| | Formicidae | *Meranoplus diversoides* | 355 km; likely a northern range extension |
| | Formicidae | *Polyrhachis (Chariomyrma) schoopae* | 195 km; inland range extension at that latitude |

| Group | Family | Species | Comments |
|---|---|---|---|
| | Formicidae | *Polyrhachis (Hagiomyrma) melanura* | 235 km; inland range extension at that latitude |
| | Formicidae | *Polyrhachis (Hagiomyrma) trapezoidea* | 175 km; inland range extension at that latitude |
| | Formicidae | *Polyrhachis (Hagiomyrma) lachesis* | 335 km; inland range extension at that latitude |
| **Leafcutter/mason bees** | Megachilidae | *Megachile dinognatha* | a northern and western range extension for QLD, and a significant in-fill in national distribution |
| | Megachilidae | *Megachile leucopogon* | western range extension |
| | Megachilidae | *Megachile macleayi* | northern and western range extension |
| **Dragonflies and damselflies** | Aeshnidae | *Gynacantha nourlangie* | 175 km; infilling of range |
| | Coenagrionidae | *Agriocnemis rubricauda* | 325 km; significant inland range extension in northern Queensland |
| | Corduliidae | *Hemicordulia tau* | 240 km; uncommon and patchy in far northern Australia |
| | Isostictidae | *Austrosticta frater* | 95 km; records from Rungulla are most southerly for the species |
| | Libellulidae | *Neurothemis stigmatizans* | 230 km; inland range extension in eastern Qld |
| | Libellulidae | *Notolibellula bicolor* | 440 km; significant range extension; in Qld previously known from only 2 localities |
| | Platycnemididae | *Nososticta solitaria* | 210 km; inland range extension at that latitude |
| **Butterflies** | Lycaenidae | *Arhopala eupolis* | 235 km; inland range extension at that latitude |
| | Lycaenidae | *Candalides xanthospilos* | 225 km; inland range extension at that latitude |
| | Nymphalidae | *Junonia hedonia* | 70 km; significant inland record at that latitude |
| | Nymphalidae | *Ypthima arctous* | 175 km; inland range extension at that latitude |
| | Pieridae | *Eurema brigitta* | 165 km; inland range extension at that latitude |
| **Bee flies** | Bombyliidae | *Anthrax crenatus* | Jowalbinna Homestead, 400 km NNE |
| | Bombyliidae | *Anthrax dolabratus* | Laura, 400 km NNE |
| | Bombyliidae | *Anthrax incomptus* | Gordonvale, 300 km NE; iNaturalist Chillagoe 240km NNE |
| | Bombyliidae | *Comptosia praeargentata* | Cardwell, 280 km ENE |
| | Bombyliidae | *Geron nigrocciput* | Ravenshoe, 260 km NE |
| | Bombyliidae | *Pseudopenthes fenestrata* | Laura, 400 km NNE |
| | Bombyliidae | *Thraxan ebenus* | Laura, 400 km NNE |
| **Scarab beetles** | Scarabaeidae | *Maechidius charaxus* | Cloncurry, 355 km NE; previously known only from type locality of Cloncurry; northern and eastern range extension |
| **True bugs** | Miridae | *Setocoris* MS WEIR n.sp. | 800 km; was discovered on the 2021 Bush Blitz to Groote Eylandt; found on a new plant host species, *Drosera lanata* |
| **Flat bugs** | Aradidae | *Arictus monteithi* | Minor inland range extension |
| **Spiders** | Euagridae | *Cethegus robustus?* | Chillagoe, approx. 300km |
| **Mites** | Tetranychidae | *Tetranychus bunda* | 1,547 km; new record for Queensland; originally recorded and described from Florida Beggar-weed (*Desmodium tortuosum*) collected in |

| Group | Family | Species | Comments |
|---|---|---|---|
| | | | Darwin; collected at 1 site, from related host plant Large Tick Trefoil (*Desmodium brachypodum*) |
| **Vascular plants** | Goodeniaceae | *Dampiera adpressa* | 167 km; range extension north from the previous known northern extent of the species |
| | Lamiaceae | *Hemigenia* sp. (White Mountains D.G.Fell DF1379) | 175 km; previously only known from White Mountains NP, and a single record W of Pentland |
| | Myrtaceae | *Kardomia squarrulosa* | 213 km; previously only known from White Mountains NP |
| | Poaceae | *Aristida burraensis* | 130 km; previously only known from White Mountains NP area |
| | Poaceae | *Triodia microstachya* | 170 km; previously known from south of the Gulf of Carpentaria, and a few disjunct locations in NE QLD, including the White Mountains NP |
| | Rutaceae | *Cyanothamnus warangensis* | 170 km; previously only known from White Mountains NP and a small area SW of Charters Towers |

# Other significant findings

This expedition resulted in the collection of a wealth of data and materials important for naming undescribed species and a wide range of other research. For most of the species collected, this includes material preserved for future DNA or other tissue analysis.

## Mammals

The incredible landscape provides good refuge for macropod species, particularly the Allied Rock-wallaby (*Petrogale assimilis*). There was an abundance of a few arboreal species including gliders and particularly the Common Brushtail Possum (*Trichosurus vulpecula*). Given the Northern Brushtail subspecies, *Trichosurus vulpecula arnhemensis*, is nationally vulnerable, it is worth monitoring the arid areas where the north Queensland subspecies (*T.v. eburacensis*) occurs.

## Birds

Blood samples were taken from 39 birds (14 species) for avian haemosporidians (blood parasites). Several new host parasite infections were identified, including the first record of *Haemoproteus* infection in a Rainbow Bee-eater (*Merops ornatus*), which has potential to be a new species.

## Reptiles and frogs

A good diversity of reptiles was observed, including 13 species that were new records for Rungulla. Amphibians were noticeably rare, with only 19 observations, excluding the Cane Toad. Of these 19 observations, 15 were the widespread Ornate Burrowing Frog (*Platyplectrum ornatum*). The low numbers and diversity of native amphibians was likely due to the time of year, with much greater numbers and higher diversity expected in the spring and summer months.

Rungulla has a variety of significant habitats. Its position on the western edge of the Desert Uplands bioregion makes it particularly important as the western limit of the distribution of

several species. Tissue samples from these specimens, found at the edges of their known ranges, will be particularly valuable for future taxonomic research.

An interesting feature, common to many of the species collected, was a noticeable lack of records in the area to the west of Rungulla. For example, the record of the Saw-shelled Turtle (*Myuchelys latisternum*) is the furthest west in Queensland until a record in the Mount Isa area. This was observed in many, if not all, species distributions and points to an important collection gap in the Gulf Plains bioregion.

## Insects

Insect collections, particularly of dragonflies, damselflies and butterflies, highlight the importance of wetland habitats at Rungulla. Spring-fed swamps, creeks and boggy seepages were particularly significant as several species associated with these habitats represented inland range extensions.

Besides the new species, significant fly collections included a micro-bee fly from a genus not currently recorded for Australia – *Empidideicus* RGBB sp. 1. Also of interest, a remarkable 215 specimens of a tiny (2.5 to 3 mm long), undescribed but previously known, bee fly (Genus B RGBB sp. 1) were collected at 9 different locations (Figure 8).

**Figure 8 Bee flies (Genus B RGBB sp. 1) pollinating *Hibiscus setulosus* flowers**

Photograph: © Copyright, Queensland Museum.

## Spiders

More than half of the 97 species of spider collected were represented only by juveniles. Despite significant rain during the expedition, the suddenness of the dry season seems to have severely reduced the number of orb weavers and jumping spiders, usually the most dominant families. Much more research is needed on the spiders of the region.

## Mites

Australia has the greatest diversity of flat mite genera in the world, with 24 of 41 known genera present and, more significantly, half of these only found in Australia. Beard and coauthors have described 6 new Australian genera since 2005. The discovery of 3 more new Australian genera from Rungulla continues to place Australia solidly at the world centre of flat mite diversity.

## Vascular plants and fungi

This expedition increased the number of plant collections from Rungulla from around 230 to 630, and nearly doubled the species list. As well as significantly increasing our knowledge of the plants and fungi of Rungulla, the many new records improved our understanding of Rungulla's rugged dissected sandstone geological formations as an island for many species – populations that occur to the south, east and west are living at the limit of their range.

Significant findings included the first records for several species of conservation significance and the confirmed presence of *Eucalyptus ammophila*. A number of valuable collections of the genus *Triodia* were made from various locations. These include the first collections from Rungulla of both *T. microstachya* and a related undescribed species, here referred to as *Triodia* sp. Bush Blitz Rungulla 1. The undescribed species has been recorded from elsewhere in north-eastern Australia but has previously been confused with *T. microstachya*. The co-occurrence of both species at the same sites at Rungulla have helped to confirm their status as distinct species.

Based on the species recorded, the funga of Rungulla is typical of regularly-burnt woodlands of the Australian Monsoon Tropics biome, and most species are also known elsewhere in northern Australia. The most significant find was the rediscovery (after nearly 50 years) and large range extension for *Campylomyces tabacinus*, a specialist on bark of living *Eucalyptus* trees (Figure 9). The new material allowed the species to be analysed genetically for the first time, allowing the genus to be placed in the Order Polyporales, where it possibly requires a new family. *Campylomyces* had previously been unplaced even to Order.

**Figure 9 The rediscovered fungus *Campylomyces tabacinus***

Photograph: © Copyright, M.D. Barrett

# Appendix A: Species lists

### Table A1 List of fauna species recorded

| Group | Family | Species | Common name |
|---|---|---|---|
| **Mammals** | Bovidae | *Bos taurus* [b] | Cattle |
| | Canidae | *Canis familiaris* | Dingo |
| | Leporidae | *Oryctolagus cuniculus* [b] | Rabbit |
| | Macropodidae | *Macropus giganteus* | Eastern Grey Kangaroo |
| | Macropodidae | *Osphranter robustus* | Common Wallaroo |
| | Macropodidae | *Petrogale assimilis* | Allied Rock-wallaby |
| | Macropodidae | *Wallabia bicolor* | Swamp Wallaby |
| | Muridae | *Rattus rattus* [b] | Black Rat |
| | Petauridae | *Petaurus norfolcensis* | Squirrel Glider |
| | Petauridae | *Petaurus notatus* | Krefft's Glider |
| | Phalangeridae | *Trichosurus vulpecula* | Common Brushtail Possum |
| | Trachyglossidae | *Tachyglossus aculeatus* | Echidna |
| | Vespertilionidae | *Scotorepens sanborni* | Northern Broad-nosed bat |
| | Vespertilionidae | *Vespadelus finlaysoni* | Finlayson's Cave Bat |
| **Birds** | Acanthizidae | *Gerygone olivacea* | White-throated Gerygone |
| | Acanthizidae | *Smicrornis brevirostris* | Weebill |
| | Accipitridae | *Accipiter fasciatus* | Brown Goshawk |
| | Accipitridae | *Aquila audax* | Wedge-tailed Eagle |
| | Accipitridae | *Haliaeetus leucogaster* | White-bellied Sea-eagle |
| | Accipitridae | *Haliastur sphenurus* | Whistling Kite |
| | Accipitridae | *Milvus migrans* | Black Kite |
| | Aegothelidae | *Aegotheles cristatus* | Australian Owlet-nightjar |
| | Alcedinidae | *Ceyx azureus* | Azure Kingfisher |
| | Alcedinidae | *Dacelo leachii* | Blue-winged Kookaburra |
| | Alcedinidae | *Dacelo novaeguineae* | Laughing Kookaburra |
| | Alcedinidae | *Todiramphus sanctus* | Sacred Kingfisher |
| | Anatidae | *Anas superciliosa* | Pacific Black Duck |
| | Ardeidae | *Ardea pacifica* | White-necked Heron |
| | Ardeidae | *Egretta intermedia* | Intermediate Egret |
| | Ardeidae | *Egretta novaehollandiae* | White-faced Heron |
| | Ardeidae | *Nycticorax caledonicus* | Nankeen Night-Heron |
| | Artamidae | *Artamus minor* | Little Woodswallow |
| | Artamidae | *Cracticus nigrogularis* | Pied Butcherbird |
| | Artamidae | *Cracticus torquatus* | Grey Butcherbird |
| | Artamidae | *Gymnorhina tibicen* | Australian Magpie |
| | Artamidae | *Strepera graculina* | Pied Currawong |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Burhinidae | *Burhinus grallarius* | Bush Stone-curlew |
| | Cacatuidae | *Cacatua galerita* | Sulphur-crested Cockatoo |
| | Cacatuidae | *Calyptorhynchus banksii* | Red-tailed Black Cockatoo |
| | Cacatuidae | *Eolophus roseicapilla* | Galah |
| | Campephagidae | *Coracina novaehollandiae* | Black-faced Cuckoo-shrike |
| | Campephagidae | *Lalage tricolor* | White-winged Triller |
| | Charadriidae | *Elseyornis melanops* | Black-fronted Dotterel |
| | Charadriidae | *Vanellus miles* | Masked Lapwing |
| | Ciconiidae | *Ephippiorhynchus asiaticus* | Black-necked Stork |
| | Columbidae | *Geopelia cuneata* | Diamond Dove |
| | Columbidae | *Geopelia placida* | Peaceful Dove |
| | Columbidae | *Geophaps scripta peninsulae* | Squatter Pigeon |
| | Columbidae | *Phaps chalcoptera* | Common Bronzewing |
| | Corcoracidae | *Struthidea cinerea* | Apostlebird |
| | Corvidae | *Corvus coronoides* | Australian Raven |
| | Corvidae | *Corvus orru* | Torresian Crow |
| | Cuculidae | *Centropus phasianinus* | Pheasant Coucal |
| | Dicaeidae | *Dicaeum hirundinaceum* | Mistletoebird |
| | Dicruridae | *Dicrurus bracteatus* | Spangled Drongo |
| | Estrildidae | *Stizoptera bichenovii* | Double-barred Finch |
| | Falconidae | *Falco berigora* | Brown Falcon |
| | Falconidae | *Falco cenchroides* | Nankeen Kestrel |
| | Gruidae | *Antigone antigone* | Sarus Crane |
| | Hirundinidae | *Petrochelidon ariel* | Fairy Martin |
| | Hirundinidae | *Petrochelidon nigricans* | Tree Martin |
| | Megapodiidae | *Alectura lathami* | Australian Brush-turkey |
| | Meliphagidae | *Conopophila rufogularis* | Rufous-throated Honeyeater |
| | Meliphagidae | *Entomyzon cyanotis* | Blue-faced Honeyeater |
| | Meliphagidae | *Gavicalis virescens* | Singing Honeyeater |
| | Meliphagidae | *Lichmera indistincta* | Brown Honeyeater |
| | Meliphagidae | *Melithreptus albogularis* | White-throated Honeyeater |
| | Meliphagidae | *Philemon citreogularis* | Little Friarbird |
| | Meliphagidae | *Philemon corniculatus* | Noisy Friarbird |
| | Meliphagidae | *Stomiopera flava* | Yellow Honeyeater |
| | Meropidae | *Merops ornatus* | Rainbow Bee-eater |
| | Monarchidae | *Grallina cyanoleuca* | Magpie-lark |
| | Monarchidae | *Myiagra rubecula* | Leaden Flycatcher |
| | Oriolidae | *Oriolus sagittatus* | Olive-backed Oriole |
| | Pachycephalidae | *Pachycephala rufiventris* | Rufous Whistler |
| | Pardalotidae | *Pardalotus striatus* | Striated Pardalote |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Petroicidae | *Microeca fascinans* | Jacky Winter |
| | Phasianidae | *Synoicus ypsilophora* | Brown Quail |
| | Podargidae | *Podargus strigoides* | Tawny Frogmouth |
| | Psittacidae | *Aprosmictus erythropterus* | Red-winged Parrot |
| | Psittacidae | *Platycercus adscitus* | Pale-headed Rosella |
| | Psittacidae | *Trichoglossus haematodus* | Rainbow Lorikeet |
| | Ptilonorhynchidae | *Chlamydera nuchalis* | Great Bowerbird |
| | Recurvirostridae | *Himantopus himantopus* | Black-winged Stilt |
| | Rhipiduridae | *Rhipidura albiscapa* | Grey Fantail |
| | Rhipiduridae | *Rhipidura leucophrys* | Willie Wagtail |
| | Strigidae | *Ninox boobook* | Boobook Owl |
| **Reptiles** | Agamidae | *Tympanocryptis tetraporophora* | Eyrean Earless Dragon |
| | Agamidae | *Diporiphora australis* | Tommy Roundhead |
| | Chelidae | *Myuchelys latisternum* | Saw-shelled Turtle |
| | Colubridae | *Boiga irregularis* | Brown Tree Snake |
| | Diplodactylidae | *Amalosia rhombifer* | Zigzag Velvet Gecko |
| | Diplodactylidae | *Oedura argentea* | Silver-eyed Velvet Gecko |
| | Diplodactylidae | *Oedura castelnaui* | Northern Velvet Gecko |
| | Gekkonidae | *Gehyra dubia* | Dubious Dtella |
| | Gekkonidae | *Gehyra einasleighensis* | Einasleigh Rock Dtella |
| | Gekkonidae | *Heteronotia binoei* | Bynoe's Gecko |
| | Pygopodidae | *Lialis burtonis* | Burton's Snake-lizard |
| | Scincidae | *Bellatorias frerei* | Major Skink |
| | Scincidae | *Carlia jarnoldae* | Lined Rainbow-skink |
| | Scincidae | *Carlia munda* | Shaded-litter Rainbow-skink |
| | Scincidae | *Carlia schmeltzii* | Schmeltz's Rainbow Skink |
| | Scincidae | *Cryptoblepharus metallicus* | Metallic Snake-eyed Skink |
| | Scincidae | *Cryptoblepharus pannosus* | Ragged Snake-eyed Skink |
| | Scincidae | *Ctenotus spaldingi* | Spalding's Ctenotus, Straight-browed Ctenotus |
| | Scincidae | *Lerista vanderduysi* | Leaden-bellied Fine-lined Slider |
| | Scincidae | *Lerista zonulata* | Wide-striped Four-toed Slider |
| | Scincidae | *Lygisaurus foliorum* | Tree-base litter Skink |
| | Scincidae | *Menetia greyii* | Common Dwarf Skink |
| | Scincidae | *Morethia taeniopleura* | Fire-tailed Skink |
| | Scincidae | *Proablepharus tenuis* | Slender Snake-eyed Skink |
| | Varanidae | *Varanus tristis* | Black-headed Monitor |
| **Frogs** | Bufonidae | *Rhinella marina* [b] | Cane Toad |
| | Limnodynastidae | *Platyplectrum ornatum* | Ornate Burrowing Frog |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Pelodryadidae | *Litoria inermis* | Bumpy Rocket Frog |
| | Pelodryadidae | *Litoria rubella* | Little Red Tree Frog |
| **Ants** | Formicidae | *Anochetus rectangularis* | na |
| | Formicidae | *Calomyrmex* RGBB sp.1 | na |
| | Formicidae | *Camponotus ephippium*-group | na |
| | Formicidae | *Camponotus* RGBB sp.1 | na |
| | Formicidae | *Camponotus* RGBB sp.2 | na |
| | Formicidae | *Camponotus* RGBB sp.3 | na |
| | Formicidae | *Camponotus* RGBB sp.4 | na |
| | Formicidae | *Camponotus* RGBB sp.5 | na |
| | Formicidae | *Camponotus* RGBB sp.6 | na |
| | Formicidae | *Camponotus* RGBB sp.7 | na |
| | Formicidae | *Camponotus* RGBB sp.8 | na |
| | Formicidae | *Camponotus* RGBB sp.9 | na |
| | Formicidae | *Camponotus* RGBB sp.10 | na |
| | Formicidae | *Cardiocondyla* RGBB sp.1 | na |
| | Formicidae | *Chelaner bifidum* | na |
| | Formicidae | *Crematogaster* RGBB sp.1 | na |
| | Formicidae | *Crematogaster* RGBB sp.2 | na |
| | Formicidae | *Crematogaster* RGBB sp.3 | na |
| | Formicidae | *Crematogaster* RGBB sp.4 | na |
| | Formicidae | *Crematogaster* RGBB sp.5 | na |
| | Formicidae | *Dolichoderus scrobiculatus* | na |
| | Formicidae | *Iridomyrmex reburrus* | na |
| | Formicidae | *Iridomyrmex* RGBB sp.1 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.2 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.3 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.4 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.5 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.6 | na |
| | Formicidae | *Iridomyrmex* RGBB sp.7 | na |
| | Formicidae | *Iridomyrmex rufoinclinus* | na |
| | Formicidae | *Iridomyrmex sanguineus* | na |
| | Formicidae | *Leptogenys* RGBB sp.1 | na |
| | Formicidae | *Melophorus* RGBB sp.1 | na |
| | Formicidae | *Melophorus* RGBB sp.2 | na |
| | Formicidae | *Melophorus* RGBB sp.3 | na |
| | Formicidae | *Meranoplus ajax* | na |
| | Formicidae | *Meranoplus diversoides* | na |
| | Formicidae | *Meranoplus* RGBB sp.1 | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Formicidae | *Meranoplus* RGBB sp.2 | na |
| | Formicidae | *Meranoplus* RGBB sp.3 | na |
| | Formicidae | *Meranoplus* RGBB sp.4 | na |
| | Formicidae | *Monomorium* RGBB sp.1 | na |
| | Formicidae | *Monomorium* RGBB sp.2 | na |
| | Formicidae | *Monomorium* RGBB sp.3 | na |
| | Formicidae | *Monomorium* RGBB sp.4 | na |
| | Formicidae | *Myrmecia varians* | na |
| | Formicidae | *Nylanderia* RGBB sp.1 | na |
| | Formicidae | *Odontomachus* RGBB sp.1 | na |
| | Formicidae | *Oecophylla smaragdina* | na |
| | Formicidae | *Opisthopsis* RGBB sp.1 | na |
| | Formicidae | *Paratrechina longicornis* [b] | Black Crazy Ant |
| | Formicidae | *Pheidole* RGBB sp.1 | na |
| | Formicidae | *Pheidole* RGBB sp.2 | na |
| | Formicidae | *Pheidole* RGBB sp.3 | na |
| | Formicidae | *Pheidole* RGBB sp.4 | na |
| | Formicidae | *Pheidole* RGBB sp.5 | na |
| | Formicidae | *Pheidole* RGBB sp.6 | na |
| | Formicidae | *Pheidole* RGBB sp.7 | na |
| | Formicidae | *Plagiolepis* RGBB sp.1 | na |
| | Formicidae | *Polyrhachis (Campomyrma)* RGBB sp.1 | na |
| | Formicidae | *Polyrhachis (Campomyrma)* RGBB sp.2 | na |
| | Formicidae | *Polyrhachis (Campomyrma)* RGBB sp.3 | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* OKBB sp.1 | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* OKBB sp.4 | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* OKBB sp.5 | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* RGBB sp.1 | na |
| | Formicidae | *Polyrhachis (Chariomyrma) RGBB sp.2* | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* RGBB sp.3 | na |
| | Formicidae | *Polyrhachis (Chariomyrma)* RGBB sp.4 | na |
| | Formicidae | *Polyrhachis (Chariomyrma) schoopae* | na |
| | Formicidae | *Polyrhachis (Hagiomyrma) lachesis* | na |
| | Formicidae | *Polyrhachis (Hagiomyrma) melanura* | na |
| | Formicidae | *Polyrhachis (Hagiomyrma) schenkii* | na |
| | Formicidae | *Polyrhachis (Hagiomyrma) trapezoidea* | na |
| | Formicidae | *Pseudoponera RGBB sp.1* | na |
| | Formicidae | *Rhytidoponera metallica* | na |
| | Formicidae | *Rhytidoponera* RGBB sp.1 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.2 | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Formicidae | *Rhytidoponera* RGBB sp.3 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.4 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.5 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.6 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.7 | na |
| | Formicidae | *Rhytidoponera* RGBB sp.8 | na |
| | Formicidae | *Solenopsis* RGBB sp.1 | na |
| | Formicidae | *Strumigenys* RGBB sp.1 [a] | na |
| | Formicidae | *Tapinoma* RGBB sp.1 | na |
| | Formicidae | *Tapinoma* RGBB sp.2 | na |
| | Formicidae | *Technomyrmex difficilis* [b] | Difficult White-footed Ant |
| | Formicidae | *Tetramorium thalidum* | na |
| | Formicidae | *Tetraponera punctulata* | na |
| **Bees** | Apidae | *Amegilla (Notomegilla) aeruginosa* | na |
| | Apidae | *Apis (Apis) mellifera* [b] | European Honey Bee |
| | Apidae | *Thyreus caeruleopunctatus* | na |
| | Apidae | *Thyreus nitidulus* | na |
| | Megachilidae | *Lithurgus* sp. | na |
| | Megachilidae | *Megachile (Eutricharaea) leucopogon* | na |
| | Megachilidae | *Megachile (Eutricharaea) macularis* | na |
| | Megachilidae | *Megachile (Eutricharaea) obtusa* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) apicata* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) aurifrons* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) dinognatha* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) macleayi* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) micrerythrura* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) paracallida* | na |
| | Megachilidae | *Megachile (Unplaced to Subgenus) turneri* | na |
| | Megachilidae | *Megachile* RGBB sp. 1 | na |
| **Wasps** | Vespidae | *Abispa ephippium* | na |
| | Vespidae | *Delta latreillei* | na |
| | Vespidae | *Polistes schach* | na |
| | Vespidae | *Polistes stigma* | na |
| | Vespidae | *Ropalidia revolutionalis* | na |
| | Vespidae | *Ropalidia romandi* | Yellow Brown Paper Wasp |
| **Butterflies** | Hesperiidae | *Hesperilla crypsigramma* | Wide-brand Sedge-skipper |
| | Hesperiidae | *Pelopidas lyelli* | Lyell's Swift |
| | Lycaenidae | *Arhopala eupolis* | Purple Oak-blue |
| | Lycaenidae | *Candalides xanthospilos* | Yellow-spotted Blue |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Lycaenidae | *Catochrysops panormus* | Pale Pea-blue |
| | Lycaenidae | *Erina delospila* | Spotted Dusky-blue |
| | Lycaenidae | *Erina erina* | Small Dusky-blue |
| | Lycaenidae | *Famegana nisa* | Black-spotted Grass-blue |
| | Lycaenidae | *Lampides boeticus* | Long-tailed Pea-blue |
| | Lycaenidae | *Leptotes plinius* | Plumbago Blue |
| | Lycaenidae | *Theclinesthes miskini* | Wattle Blue |
| | Lycaenidae | *Zizina otis* | Common Grass-blue |
| | Lycaenidae | *Zizula hylax* | Dainty Grass-blue |
| | Nymphalidae | *Acraea andromacha* | Glasswing |
| | Nymphalidae | *Acraea terpsicore* | Tawny Coster |
| | Nymphalidae | *Danaus petilia* | Lesser Wanderer |
| | Nymphalidae | *Euploea corinna* | Common Crow |
| | Nymphalidae | *Euploea sylvester* | Two-brand Crow |
| | Nymphalidae | *Hypolimnas bolina* | Varied Eggfly |
| | Nymphalidae | *Junonia hedonia* | Chocolate Argus |
| | Nymphalidae | *Junonia orithya* | Blue Argus |
| | Nymphalidae | *Junonia villida* | Meadow Argus |
| | Nymphalidae | *Ypthima arctous* | Dusky Knight |
| | Papilionidae | *Cressida cressida* | Clearwing Swallowtail |
| | Papilionidae | *Papilio aegeus* | Orchard Swallowtail |
| | Pieridae | *Catopsilia pomona* | Lemon Migrant |
| | Pieridae | *Catopsilia scylla* | Orange Migrant |
| | Pieridae | *Cepora perimale* | Caper Gull |
| | Pieridae | *Eurema brigitta* | No-brand Grass-yellow |
| | Pieridae | *Eurema hecabe* | Large Grass-yellow |
| | Pieridae | *Eurema herla* | Macleay's Grass-yellow |
| **Moths** | Erebidae | *Amerila rubripes* | Walker's Frother |
| | Sphingidae | *Agrius godarti* | Godart's Hawk Moth |
| | Sphingidae | *Hippotion scrofa* | Coprosma Hawk Moth |
| | Sphingidae | *Hyles livornicoides* | Australian Striped Hawk Moth |
| **Dragonflies and damselflies** | Aeshnidae | *Anax papuensis* | Australian Emperor |
| | Aeshnidae | *Austrogynacantha heterogena* | Australian Duskhawker |
| | Aeshnidae | *Gynacantha nourlangie* | Cave Duskhawker |
| | Coenagrionidae | *Agriocnemis rubricauda* | Red-rumped Wisp |
| | Coenagrionidae | *Argiocnemis rubescens* | Red-tipped Shadefly |
| | Coenagrionidae | *Ischnura aurora* | Aurora Bluetail |
| | Coenagrionidae | *Pseudagrion aureofrons* | Gold-fronted Riverdamsel |
| | Coenagrionidae | *Pseudagrion jedda* | Dusky Riverdamsel |
| | Coenagrionidae | *Pseudagrion microcephalum* | Blue Riverdamsel |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Corduliidae | *Hemicordulia intermedia* | Tau Emerald |
| | Corduliidae | *Hemicordulia tau* | Yellow-spotted Emerald |
| | Isostictidae | *Austrosticta frater* | Eastern Pondsitter |
| | Lestidae | *Austrolestes insularis* | Northern Ringtail |
| | Lestidae | *Austrolestes leda* | Wandering Ringtail |
| | Lestidae | *Lestes concinnus* | Dusky Spreadwing |
| | Libellulidae | *Crocothemis nigrifrons* | Black-headed Skimmer |
| | Libellulidae | *Diplacodes bipunctata* | Wandering Percher |
| | Libellulidae | *Diplacodes haematodes* | Scarlet Percher |
| | Libellulidae | *Nannodiplax rubra* | Pygmy Percher |
| | Libellulidae | *Neurothemis stigmatizans* | Painted Grasshawk |
| | Libellulidae | *Notolibellula bicolor* | Bicoloured Skimmer |
| | Libellulidae | *Orthetrum caledonicum* | Blue Skimmer |
| | Libellulidae | *Orthetrum migratum* | Rosy Skimmer |
| | Libellulidae | *Orthetrum villosovittatum* | Fiery Skimmer |
| | Libellulidae | *Pantala flavescens* | Wandering Glider |
| | Libellulidae | *Rhyothemis braganza* | Irridescent Flutterer |
| | Libellulidae | *Tholymis tillarga* | Twister |
| | Libellulidae | *Tramea loewii* | Common Glider |
| | Platycnemididae | *Nososticta solitaria* | Fivespot Threadtail |
| **Flies** | Asilidae | *Leptogaster* RGBB sp. 5 | na |
| | Asilidae | Asilidae New Genus New Species RGBB sp. 4 | na |
| | Asilidae | *Ommatius imaginis* | na |
| | Asilidae | *Ommatius* RGBB sp. 1 [a] | na |
| | Asilidae | *Ommatius* RGBB sp. 2 | na |
| | Asilidae | *Ommatius* RGBB sp. 3 | na |
| | Asilidae | *Ommatius* sp. | na |
| | Asilidae | *Reburrus bancrofti* | na |
| | Asilidae | *Stichopogon* RGBB sp. 6 | na |
| | Asilidae | *Zosteria illingworthi* | na |
| | Bombyliidae | *Anthrax crenatus* | na |
| | Bombyliidae | *Anthrax dolabratus* | na |
| | Bombyliidae | *Anthrax incomptus* | na |
| | Bombyliidae | *Comptosia praeargentata* | na |
| | Bombyliidae | *Cryomyia* RGBB sp. 1 | na |
| | Bombyliidae | *Docidomyia* RGBB sp. 1 | na |
| | Bombyliidae | *Empidideicus* RGBB sp. 1 [a] | na |
| | Bombyliidae | Genus B (Evenhuis 2022) RGBB sp. 1 | na |
| | Bombyliidae | Genus B (Evenhuis 2022) RGBB sp. 2 [a] | na |
| | Bombyliidae | Genus B (Evenhuis 2022) RGBB sp. 3 [a] | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Bombyliidae | Genus B (Evenhuis 2022) RGBB sp. 4 [a] | na |
| | Bombyliidae | *Geron nigrocciput* | na |
| | Bombyliidae | *Lepidanthrax* RGBB sp. 1 | na |
| | Bombyliidae | *Petrorossia* RGBB sp. 1 | na |
| | Bombyliidae | *Pseudopenthes fenestrata* | na |
| | Bombyliidae | *Thraxan ebenus* | na |
| | Bombyliidae | *Thraxan?* RGBB sp. 1 | na |
| | Syrphidae | *Austalis smaragdi* | na |
| | Syrphidae | *Ischiodon scutellaris* | na |
| | Syrphidae | *Paragus crenulatus* | na |
| | Syrphidae | *Simosyrphus grandicornis* | na |
| | Therevidae | *Acraspisa* RGBB sp. 1 | na |
| | Therevidae | *Acupalpa* RGBB sp. 1 | na |
| | Therevidae | *Bonjeania* RGBB sp. 1 | na |
| | Therevidae | *Bonjeania* RGBB sp. 2 | na |
| | Therevidae | *Bonjeania* RGBB sp. 3 | na |
| **Beetles** | Dytiscidae | *Austrodytes insularis* | na |
| | Dytiscidae | *Eretes australis* | na |
| | Scarabaeidae | *Calloodes grayianus* | Golden Bordered Beetle |
| | Scarabaeidae | *Calloodes rayneri* | na |
| | Scarabaeidae | *Colpochila obesa* [b] | na |
| | Scarabaeidae | *Digitonthophagus gazella* [b] | na |
| | Scarabaeidae | *Euoniticellus intermedius* [b] | na |
| | Scarabaeidae | *Liatongus militaris* [b] | na |
| | Scarabaeidae | *Maechidius charaxus* | na |
| | Scarabaeidae | *Onitis viridulus* [b] | na |
| | Scarabaeidae | *Onthophagus consentaneus* | na |
| | Scarabaeidae | *Onthophagus desectus* | na |
| | Scarabaeidae | *Sisyphus rubrus* [b] | na |
| **True bugs** | Alydidae | *Riptortus* SP001 | na |
| | Aradidae | *Arictus monteithi* | na |
| | Aradidae | *Brachyrhynchus australis* | na |
| | Coreidae | *Gralliclava* SP001 | na |
| | Coreidae | *Pomponatius* SP001 | na |
| | Cydnidae | CYDN GN001 SP001 | na |
| | Cydnidae | CYDN GN002 SP001 | na |
| | Gerridae | GERR GN001 SP001 | na |
| | Gerridae | GERR GN002 SP001 | na |
| | Lygaeidae | *Eurynysius* SP001 | na |
| | Lygaeidae | *Graptostethus servus* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Lygaeidae | *Spilostethus* SP001 | na |
| | Miridae | *Ausejanus albisignatus* | na |
| | Miridae | *Blesingia* SP001 | na |
| | Miridae | *Campylomma* SP001 | na |
| | Miridae | CREM GN001 SP001 | na |
| | Miridae | CREM GN003 SP001 | na |
| | Miridae | MIRI GN001 SP001 | na |
| | Miridae | MIRI GN003 SP001 | na |
| | Miridae | ORTH GN001 SP001 | na |
| | Miridae | PHYL GN002 SP002 | na |
| | Miridae | PHYL GN002 SP003 | na |
| | Miridae | PHYL GN003 SP001 | na |
| | Miridae | *Setocoris* MS WEIR n.sp. | na |
| | Miridae | *Singhalesia* SP001 n.sp. [a] | na |
| | Miridae | ZANC GN001 SP001 n.sp. [a] | na |
| | Nabidae | *Phorticus* SP001 n.sp. [a] | na |
| | Oxycarenidae | *Oxycarenus arctatus* | na |
| | Pachygronthidae | *Pachygrontha* nr. *walkeri* | na |
| | Pachygronthidae | *Stenophyella macreta* | na |
| | Pentatomidae | *Antestiopsis* SP001 | na |
| | Pentatomidae | *Dippilana membranacea* | na |
| | Pentatomidae | nr. *Dippilana* SP001 | na |
| | Pentatomidae | *Ocirrhoe* SP001 | na |
| | Pentatomidae | *Piezodorus oceanicus* | na |
| | Pentatomidae | *Poecilometis nigriventris* | na |
| | Pentatomidae | *Poecilometis nymphs* | na |
| | Pentatomidae | *Austromalaya* SP001 | na |
| | Pentatomidae | PENT GN001 SP001 | na |
| | Pentatomidae | *Piezodorus oceanicus* | na |
| | Pyrrhocoridae | *Dysdercus cingulatus* | na |
| | Reduviidae | *Helonotus* SP001 | na |
| | Reduviidae | *Poecilobdallus formosus* | na |
| | Reduviidae | *Poecilosphodrus gratiosus* | na |
| | Reduviidae | *Poecilosphodrus* SP001 n.sp. [a] | na |
| | Reduviidae | *Poecilosphodrus* SP002 n.sp. [a] | na |
| | Reduviidae | *Poecilosphodrus* SP003 n.sp. [a] | na |
| | Reduviidae | *Trachylestes* SP001 | na |
| | Rhyparochromidae | *Dieuches* SP001 | na |
| | Rhyparochromidae | *Remaudiereana* SP001 | na |
| | Rhyparochromidae | RHYP GN001 SP001 | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Rhyparochromidae | RHYP GN002 SP001 | na |
| | Saldidae | *Saldula* SP001 | na |
| | Scutelleridae | *Coleotichus costatus* | na |
| | Scutelleridae | *Lampromicra senator* | na |
| | Tingidae | *Epimixia vulturna* | na |
| | Tingidae | *Urentius sarinae* | na |
| | Veliidae | *Nesidovelia* SP001 | na |
| **Cicada** | Cicadidae | *Thopha sessiliba* | Northern Double Drummer |
| **Cockroach** | Blattidae | *Megazosteria patula* | na |
| **Katydid** | Tettigoniidae | *Chlorobalius leucoviridis* | Spotted Predatory Katydid |
| **Spiders** | Araneidae | *Araneus* sp. | na |
| | Araneidae | *Argiope keyserlingi* | na |
| | Araneidae | *Argiope mascordi* | na |
| | Araneidae | *Argiope ocyaloides* | na |
| | Araneidae | *Argiope protensa* | na |
| | Araneidae | *Austracantha minax* | Jewel Spider, Christmas Spider |
| | Araneidae | *Cyrtobil darwini* | Darwin's Cyrtobil |
| | Araneidae | *Cyrtophora hirta* | Russian Tent spider |
| | Araneidae | *Hortophora transmarina* | na |
| | Araneidae | *Neoscona theisi* | na |
| | Araneidae | *Plebs eburnus* | na |
| | Barychelidae | *Zophorame* sp.nov.22 | na |
| | Cheiracanthiidae | *Cheiracanthium* sp.6 | na |
| | Clubionidae | *Clubiona* sp.2 | na |
| | Corinnidae | *Iridonyssus* sp. | na |
| | Corinnidae | *Nyssus pseudomaculata* | na |
| | Corinnidae | *Poecilipta* sp. | na |
| | Cyatholipidae | *Matilda* spnov30 [a] | na |
| | Deinopidae | *Asianopis subrufa* | na |
| | Desidae | *Phryganoporus candidus* | na |
| | Euagridae | *Cethegus robustus?* | na |
| | Filistatidae | *Wandella* sp. | na |
| | Gnaphosidae | *Austrammo* sp. | na |
| | Gnaphosidae | *Eilica* sp. | na |
| | Gnaphosidae | *Encoptarthria* sp. | na |
| | Gnaphosidae | *Gnaphosidae* sp.23 | na |
| | Gnaphosidae | *Gnaphosidae* sp.24 | na |
| | Gnaphosidae | *Molycria* sp. | na |
| | Gnaphosidae | *Wydundra* sp.nov.28 | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Hersiliidae | *Tamopsis* sp. | na |
| | Lamponidae | *Pseudolampona* sp.nov.25 | na |
| | Linyphiidae | *Laperousea* sp.4 | na |
| | Lycosidae | *Allocosa palabunda?* | na |
| | Lycosidae | *Artoria* sp. | na |
| | Lycosidae | *Lycosa* sp.16 | na |
| | Lycosidae | *Venatrix* sp. | na |
| | Lycosidae | *Venonia micarioides* | na |
| | Miturgidae | *Argoctenus* sp.nov.26 | na |
| | Miturgidae | *Hestimodema* sp. | na |
| | Miturgidae | *Mituliodon tarantulinus* | na |
| | Miturgidae | *Miturga gilva?* | na |
| | Miturgidae | *Miturgiella vulgaris* | na |
| | Miturgidae | *Thasyraea* sp.1 | na |
| | Miturgidae | *Tuxoctenus gloverae* | na |
| | Nephilidae | *Trichonephila edulis* | Australian Golden Orb Weaver |
| | Nesticidae | *Nesticella* sp.5 | na |
| | Oonopidae | Oonopidae sp.3 | na |
| | Oonopidae | *Opopaea* sp.nov.15 | na |
| | Oonopidae | *Orchestina* sp.nov.10 | na |
| | Oxyopidae | *Oxyopes* sp.17 | na |
| | Oxyopidae | *Oxyopes* sp.9 | na |
| | Pholcidae | *Artema atlanta* [b] | Giant Daddy long legs |
| | Pholcidae | *Wugigarra sphaeroides* | na |
| | Pholcidae | *Wugigarra* sp. | na |
| | Phonognathidae | *Phonognatha graeffei* | Leaf Curling Spider |
| | Pisauridae | *Dendrolycosa icadia* | Tree Water Spider |
| | Pisauridae | *Dolomedes facetus?* | Elegant Water Spider |
| | Pisauridae | *Dolomedes instabilis?* | Western Water Spider |
| | Pisauridae | *Perenethis venusta* | na |
| | Salticidae | *Cosmophasis micans* | na |
| | Salticidae | *Maratus griseus* | na |
| | Salticidae | *Maratus* sp.14 | na |
| | Salticidae | *Maratus* sp.7 | na |
| | Salticidae | *Mopsus mormon* | Monkey Face Jumping Spider |
| | Salticidae | *Myrmarachne* sp.12 | na |
| | Salticidae | *Opisthoncus* sp. | na |
| | Salticidae | *Sandalodes* sp.8 | na |
| | Salticidae | *Simaethula* sp. | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Salticidae | *Zenodorus orbiculatus* | na |
| | Selenopidae | *Karaops* sp.nov.19 a | na |
| | Sparassidae | *Neosparassus* sp.11 | na |
| | Tetragnathidae | *Leucauge granulata* | na |
| | Tetragnathidae | *Tetragnatha* sp. | na |
| | Theraphosidae | *Selenotypus* sp.nov.29 | na |
| | Theridiidae | *Achaearanea* sp. | na |
| | Theridiidae | *Argyrodes antipodianus* | Silver Dewdrop Spider |
| | Theridiidae | *Euryopis elegans* | na |
| | Theridiidae | *Latrodectus hasseltii* [b] | Redback Spider |
| | Theridiidae | *Phoroncidia* sp. | na |
| | Theridiidae | *Theridion* sp.13 | na |
| | Thomisidae | *Cymbacha* sp. | na |
| | Thomisidae | *Poecilothomisus* sp. | na |
| | Thomisidae | *Sidymella hirsuta* | na |
| | Thomisidae | *Tharpyna* sp.nov.20 | na |
| | Thomisidae | *Tharrhalea multopunctata* | na |
| | Thomisidae | *Tharrhalea* sp.21 | na |
| | Thomisidae | *Thomisus spectabilis* | White Crab Spider |
| | Thomisidae | *Tmarus variabilis* | na |
| | Thomisidae | *Zygometis xanthogaster* | Milky Crab Spider |
| | Trachycosmidae | Trachycosmiidae sp. | na |
| | Uloboridae | *Philoponella* sp. | na |
| | Zodariidae | *Habronestes* sp.21 | na |
| | Zodariidae | *Hetaerica scenica* | na |
| | Zodariidae | *Holasteron* sp.22 | na |
| | Zodariidae | *Neostorena* sp. | na |
| | Zodariidae | *Storena* sp. | na |
| | Zodariidae | Zodariidae sp. | na |
| **Mites** | Phytoseiidae | *Neoseiulus* BBRNP sp. 1 [a] | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. 2 [a] | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. 3 [a] | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. 4 [a] | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. A | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. B | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. C | na |
| | Phytoseiidae | *Neoseiulus* BBRNP sp. D | na |
| | Phytoseiidae | *Phytoseius* BBRNP sp. 1 | na |
| | Phytoseiidae | *Phytoseius* BBRNP sp. 2 | na |
| | Tenuipalpidae | *Acaricis* BBRNP sp. 1 [a] | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Tenuipalpidae | *Acaricis* BBRNP sp. 2 [a] | na |
| | Tenuipalpidae | *Aegyptobia* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Amblypalpus* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Australopalpus* BBRNP sp. 1 | na |
| | Tenuipalpidae | *Bauchania* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Brevipalpus* BBRNP sp. 1 | na |
| | Tenuipalpidae | *Dolichotetranychus* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Dolichotetranychus* BBRNP sp. 2 [a] | na |
| | Tenuipalpidae | *Dolichotetranychus* BBRNP sp. 3 [a] | na |
| | Tenuipalpidae | Tenuipalpidae Genus A BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | Tenuipalpidae Genus B BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | Tenuipalpidae Genus C BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Krugeria* BBRNP sp. 1 | na |
| | Tenuipalpidae | *Magdalenapalpus* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Prolixus* BBRNP sp. 1 | na |
| | Tenuipalpidae | *Raoiella* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Raoiella* BBRNP sp. 2 [a] | na |
| | Tenuipalpidae | *Tegopalpus* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Tenuipalpus* BBRNP sp. 1 [a] | na |
| | Tenuipalpidae | *Tenuipalpus* BBRNP sp. 2 [a] | na |
| | Tetranychidae | *Eotetranychus* BBRNP sp. 1 [a] | na |
| | Tetranychidae | *Eotetranychus* BBRNP sp. 2 | na |
| | Tetranychidae | *Tetranychus bunda* | na |
| | Tuckerellidae | *Tuckerella* BBRNP sp. 1 | na |

**a** Putative new species. **b** Introduced and/or pest species. **na** Not available.

## Table A2 List of flora and funga species recorded

| Group | Family | Species | Common name |
|---|---|---|---|
| **Vascular plants** | Acanthaceae | *Brunoniella acaulis* | na |
| | Acanthaceae | *Dipteracanthus australasicus* subsp. *corynothecus* | na |
| | Acanthaceae | *Nelsonia campestris* | na |
| | Acanthaceae | *Rostellularia adscendens* subsp. (Irvinebank A.R.Bean+ 5461) | na |
| | Amaranthaceae | *Gomphrena flaccida* | na |
| | Apocynaceae | *Cryptostegia grandiflora* [b] | Rubber Vine |
| | Apocynaceae | *Cynanchum leptolepis* | na |
| | Apocynaceae | *Cynanchum viminale* | na |
| | Apocynaceae | *Leichhardtia viridiflora* subsp. *tropica* | na |
| | Asparagaceae | *Lomandra confertifolia* subsp. *pallida* | na |
| | Asparagaceae | *Thysanotus chinensis* | na |
| | Asteraceae | *Acanthospermum hispidum* [b] | Star Burr |
| | Asteraceae | *Cyanthillium cinereum* | na |
| | Asteraceae | *Peripleura spechtii (Vittadinia spechtii)* | na |
| | Asteraceae | *Pluchea punctata* [c] | na |
| | Asteraceae | *Pterocaulon verbascifolium* | na |
| | Blechnaceae | *Blechnum orientale* | na |
| | Boraginaceae | *Trichodesma zeylanicum* | na |
| | Cannabaceae | *Trema tomentosa* | Poison Peach |
| | Caryophyllaceae | *Polycarpaea corymbosa* | na |
| | Caryophyllaceae | *Polycarpaea spirostylis* | na |
| | Centrolepidaceae | *Centrolepis banksii* | na |
| | Centrolepidaceae | *Centrolepis exserta* | na |
| | Chrysobalanaceae | *Parinari nonda* | Nonda Plum |
| | Cleomaceae | *Arivela viscosa* | na |
| | Combretaceae | *Terminalia aridicola* subsp. *chillagoensis* | na |
| | Convolvulaceae | *Bonamia media* | na |
| | Convolvulaceae | *Cuscuta chinensis* | na |
| | Convolvulaceae | *Evolvulus alsinoides* var. *decumbens* | na |
| | Convolvulaceae | *Evolvulus alsinoides* var. indet. | na |
| | Convolvulaceae | *Ipomoea abrupta* | na |
| | Convolvulaceae | *Ipomoea eriocarpa* | na |
| | Convolvulaceae | *Ipomoea plebeia* | na |
| | Convolvulaceae | *Jacquemontia paniculata* | na |
| | Convolvulaceae | *Polymeria* sp. (Chillagoe K.R.McDonald KRM328) | na |
| | Cupressaceae | *Callitris intratropica* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Cyperaceae | *Anthelepis undulata* | na |
| | Cyperaceae | *Machaerina rubiginosa* | na |
| | Cyperaceae | *Cyperus castaneus* | na |
| | Cyperaceae | *Cyperus decompositus* | na |
| | Cyperaceae | *Cyperus haspan* subsp. *juncoides* | na |
| | Cyperaceae | *Cyperus microcephalus* subsp. *microcephalus* | na |
| | Cyperaceae | *Cyperus microcephalus* subsp. *saxicola* | na |
| | Cyperaceae | *Fimbristylis dichotoma* | na |
| | Cyperaceae | *Fimbristylis nutans* | na |
| | Cyperaceae | *Fimbristylis pauciflora* | na |
| | Cyperaceae | *Fimbristylis sphaerocephala* | na |
| | Cyperaceae | *Fimbristylis trigastrocarya* | na |
| | Cyperaceae | *Fuirena umbellata* | na |
| | Cyperaceae | *Gahnia aspera* | Rough Saw-sedge |
| | Cyperaceae | *Rhynchospora brownii* | na |
| | Cyperaceae | *Rhynchospora pterochaeta* | na |
| | Cyperaceae | *Schoenus* aff. *kennyi* | na |
| | Cyperaceae | *Schoenus kennyi* | na |
| | Cyperaceae | *Scleria brownii* | na |
| | Cyperaceae | *Scleria rugosa* | na |
| | Cyperaceae | *Scleria sphacelata* | na |
| | Dilleniaceae | *Hibbertia lepidota* | na |
| | Droseraceae | *Drosera burmanni* | na |
| | Droseraceae | *Drosera lanata* | na |
| | Eriocaulaceae | *Eriocaulon fistulosum* | na |
| | Euphorbiaceae | *Cassytha filiformis* | na |
| | Euphorbiaceae | *Euphorbia biconvexa* | na |
| | Euphorbiaceae | *Euphorbia mitchelliana* var. *mitchelliana* | na |
| | Euphorbiaceae | *Euphorbia tannensis* subsp. *eremophila* | na |
| | Fabaceae | *Acacia lazaridis* | na |
| | Fabaceae | *Acacia leptostachya* | na |
| | Fabaceae | *Acacia multisiliqua* | na |
| | Fabaceae | *Acacia orthocarpa* | na |
| | Fabaceae | *Adenanthera abrosperma* | na |
| | Fabaceae | *Cajanus acutifolius* | na |
| | Fabaceae | *Cajanus marmoratus* | na |
| | Fabaceae | *Chamaecrista absus* var. *absus* | na |
| | Fabaceae | *Crotalaria brevis* | na |
| | Fabaceae | *Crotalaria juncea* | na |
| | Fabaceae | *Crotalaria medicaginea* var. *medicaginea* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Fabaceae | *Crotalaria novae-hollandiae* subsp. *novae-hollandiae* | na |
| | Fabaceae | *Crotalaria pallida* var. *obovata* | na |
| | Fabaceae | *Crotalaria verrucosa* | na |
| | Fabaceae | *Desmodium brachypodum (Oxytes brachypoda)* | na |
| | Fabaceae | *Desmodium filiforme (Grona filiformis)* | na |
| | Fabaceae | *Desmodium rhytidophyllum* | na |
| | Fabaceae | *Glycine tomentella* | na |
| | Fabaceae | *Indigofera colutea* | na |
| | Fabaceae | *Indigofera hirsuta* | na |
| | Fabaceae | *Indigofera linifolia* | na |
| | Fabaceae | *Indigofera linnaei* | na |
| | Fabaceae | *Indigofera sericovexilla* | na |
| | Fabaceae | *Jacksonia ramosissima* | na |
| | Fabaceae | *Labichea brassii* | na |
| | Fabaceae | *Labichea rupestris* | na |
| | Fabaceae | *Leptosema oxylobioides* | na |
| | Fabaceae | *Mirbelia viminalis* | na |
| | Fabaceae | *Rhynchosia minima* var. *minima* | na |
| | Fabaceae | *Senna leptoclada* | na |
| | Fabaceae | *Senna occidentalis* [b] | Coffee Senna |
| | Fabaceae | *Senna oligoclada* | na |
| | Fabaceae | *Sesbania cannabina* var. *cannabina* | na |
| | Fabaceae | *Tephrosia astragaloides* | na |
| | Fabaceae | *Tephrosia conspicua* | na |
| | Fabaceae | *Tephrosia* sp. (Pannikan Springs A.R.Bean+ 5612) | na |
| | Fabaceae | *Vachellia clarksoniana* | na |
| | Fabaceae | *Zornia adenophora* | na |
| | Fabaceae | *Zornia stirlingii* | na |
| | Gleicheniaceae | *Dicranopteris linearis* | na |
| | Goodeniaceae | *Dampiera adpressa* | na |
| | Goodeniaceae | *Goodenia gracilis* | na |
| | Goodeniaceae | *Scaevola* aff. *revoluta* | na |
| | Haloragaceae | *Gonocarpus acanthocarpus* | na |
| | Hypericaceae | *Hypericum gramineum* | na |
| | Lamiaceae | *Anisomeles ornans* | na |
| | Lamiaceae | *Callicarpa candicans* | na |
| | Lamiaceae | *Hemigenia* sp. (White Mountains D.G.Fell DF1379) | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Lamiaceae | *Mesosphaerum suaveolens* [b] | Hyptis |
| | Lamiaceae | *Ocimum caryophyllinum* | na |
| | Lamiaceae | *Prostanthera* sp. Gilbert River (M.D.Godwin+ C4040) | na |
| | Lamiaceae | *Salvia misella* [b] | na |
| | Lindsaeaceae | *Lindsaea ensifolia* subsp. *ensifolia* | na |
| | Loganiaceae | *Mitrasacme nudicaulis* var. *nudicaulis* | na |
| | Loranthaceae | *Diplatia grandibractea* | na |
| | Lycopodiaceae | *Palhinhaea cernua* | na |
| | Malvacea | *Melhania oblongifolia* | na |
| | Malvaceae | *Abutilon hannii* | na |
| | Malvaceae | *Corchorus pumilio* | na |
| | Malvaceae | *Corchorus sericeus* subsp. *densiflorus* | na |
| | Malvaceae | *Corchorus sidoides* | na |
| | Malvaceae | *Dicarpidium monoicum* | na |
| | Malvaceae | *Hibiscus leptocladus* | na |
| | Malvaceae | *Hibiscus meraukensis* | na |
| | Malvaceae | *Hibiscus setulosus* | na |
| | Malvaceae | *Malvastrum americanum* | na |
| | Malvaceae | *Seringia adenolasia* | na |
| | Malvaceae | *Sida acuta* [b] | na |
| | Malvaceae | *Sida cordifolia* [b] | Flannel Weed |
| | Malvaceae | *Sida hackettiana* | na |
| | Malvaceae | *Sida macropoda* | na |
| | Malvaceae | *Sida rohlenae* | na |
| | Malvaceae | *Triumfetta* aff. *micracantha* | na |
| | Malvaceae | *Triumfetta micracantha* | na |
| | Malvaceae | *Triumfetta pentandra* [b] | na |
| | Melastomataceae | *Melastoma malabathricum* subsp. *malabathricum (M. affine)* | na |
| | Meliaceae | *Turraea pubescens* | na |
| | Menispermaceae | *Tinospora smilacina* | na |
| | Myrtaceae | *Calytrix leptophylla* | na |
| | Myrtaceae | *Corymbia gilbertensis* | na |
| | Myrtaceae | *Eucalyptus ammophila* | na |
| | Myrtaceae | *Eucalyptus camaldulensis* | na |
| | Myrtaceae | *Eucalyptus chartaboma* | na |
| | Myrtaceae | *Eucalyptus leptophleba* | Molloy Box |
| | Myrtaceae | *Eucalyptus provecta* | na |
| | Myrtaceae | *Corymbia setosa* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Myrtaceae | *Kardomia squarrulosa* [c] | na |
| | Myrtaceae | *Leptospermum pallidum* | na |
| | Myrtaceae | *Lithomyrtus hypoleuca* | na |
| | Myrtaceae | *Lithomyrtus microphylla* | na |
| | Myrtaceae | *Lithomyrtus retusa* | na |
| | Myrtaceae | *Lophostemon grandiflorus* subsp. *riparius* | Northern Swamp Mahogany |
| | Myrtaceae | *Lophostemon suaveolens* | na |
| | Myrtaceae | *Melaleuca fluviatilis* | na |
| | Myrtaceae | *Melaleuca foliolosa* | na |
| | Myrtaceae | *Melaleuca nervosa* subsp. *nervosa* | na |
| | Myrtaceae | *Syzygium eucalyptoides* subsp. *eucalyptoides* | na |
| | Myrtaceae | *Xanthostemon umbrosus* | na |
| | Olacaceae | *Ximenia americana* | Wild Plum |
| | Onagraceae | *Ludwigia octovalvis* | na |
| | Pandanaceae | *Pandanus spiralis* | na |
| | Phyllanthaceae | *Flueggea leucopyrus* | na |
| | Phyllanthaceae | *Phyllanthus hebecarpus (P. carpentariae)* | na |
| | Phyllanthaceae | *Synostemon elachophyllus* subsp. *elachophyllus* | na |
| | Picrodendraceae | *Petalostigma pubescens* | Quinine Tree |
| | Plantaginaceae | *Scoparia dulcis* [b] | na |
| | Plantaginaceae | *Stemodia lythrifolia* | na |
| | Poaceae | *Aristida burraensis* | na |
| | Poaceae | *Aristida calycina* var. *calycina* | na |
| | Poaceae | *Aristida sciuroides* | na |
| | Poaceae | *Arundinella setosa* | na |
| | Poaceae | *Cleistochloa subjuncea* | na |
| | Poaceae | *Cymbopogon obtectus* | na |
| | Poaceae | *Cymbopogon refractus* | na |
| | Poaceae | *Digitaria breviglumis* | na |
| | Poaceae | *Digitaria minima* | na |
| | Poaceae | *Ectrosia agrostoides* | na |
| | Poaceae | *Ectrosia confusa* | na |
| | Poaceae | *Enneapogon lindleyanus* | na |
| | Poaceae | *Enneapogon nigricans* | na |
| | Poaceae | *Eragrostis fallax* | na |
| | Poaceae | *Eragrostis schultzii* | na |
| | Poaceae | *Eriachne ?humilis* | na |
| | Poaceae | *Eriachne mucronata* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Poaceae | *Eriachne obtusa* | na |
| | Poaceae | *Eriachne pallescens* var. *pallescens* | na |
| | Poaceae | *Eriachne* sp. Dugald River (Dugald River B.K.Simon+ 3007) | na |
| | Poaceae | *Eriachne stipacea* | na |
| | Poaceae | *Eriachne vesiculosa* | na |
| | Poaceae | *Heteropogon triticeus* | na |
| | Poaceae | *Panicum effusum* | na |
| | Poaceae | *Panicum trichoides* | na |
| | Poaceae | *Paspalidium distans* | na |
| | Poaceae | *Perotis rara* | na |
| | Poaceae | *Schizachyrium fragile* | na |
| | Poaceae | *Sporobolus australasicus* | na |
| | Poaceae | *Sporobolus jacquemontii* [b] | American Rat's Tail Grass |
| | Poaceae | *Sporobolus pulchellus* | na |
| | Poaceae | *Themeda avenacea* | na |
| | Poaceae | *Triodia bitextura* | na |
| | Poaceae | *Triodia microstachya* | na |
| | Poaceae | *Triodia molesta* | na |
| | Poaceae | *Triodia pungens* | na |
| | Poaceae | *Triodia* sp. Bush Blitz Rungulla 1 | na |
| | Poaceae | *Tripogonella loliiformis* | na |
| | Poaceae | *Urochloa holosericea* subsp. *holosericea* | na |
| | Polygalaceae | *Comesperma pallidum* | na |
| | Pontederiaceae | *Monochoria cyanea (Pontederia cyanea)* | na |
| | Portulacaceae | *Portulaca pilosa* [b] | na |
| | Proteaceae | *Grevillea decora* subsp. *decora* | na |
| | Proteaceae | *Grevillea glauca* | Bushman's Clothes Peg |
| | Proteaceae | *Grevillea mimosoides* | na |
| | Proteaceae | *Xylomelum scottianum* | na |
| | Pteridaceae | *Cheilanthes brownii* | na |
| | Pteridaceae | *Cheilanthes distans* | na |
| | Pteridaceae | *Cheilanthes sieberi* | na |
| | Pteridaceae | *Pellaea muelleri (Paraceterach muelleri)* | na |
| | Rhamnaceae | *Cryptandra ?pogonoloba* subsp. *pogonoloba* | na |
| | Rhamnaceae | *Cryptandra pogonoloba* subsp. *pogonoloba* | na |
| | Rubiaceae | *Gardenia tessellaris* | na |
| | Rubiaceae | *Larsenaikia ochreata* | na |
| | Rubiaceae | *Pavetta granitica* | na |

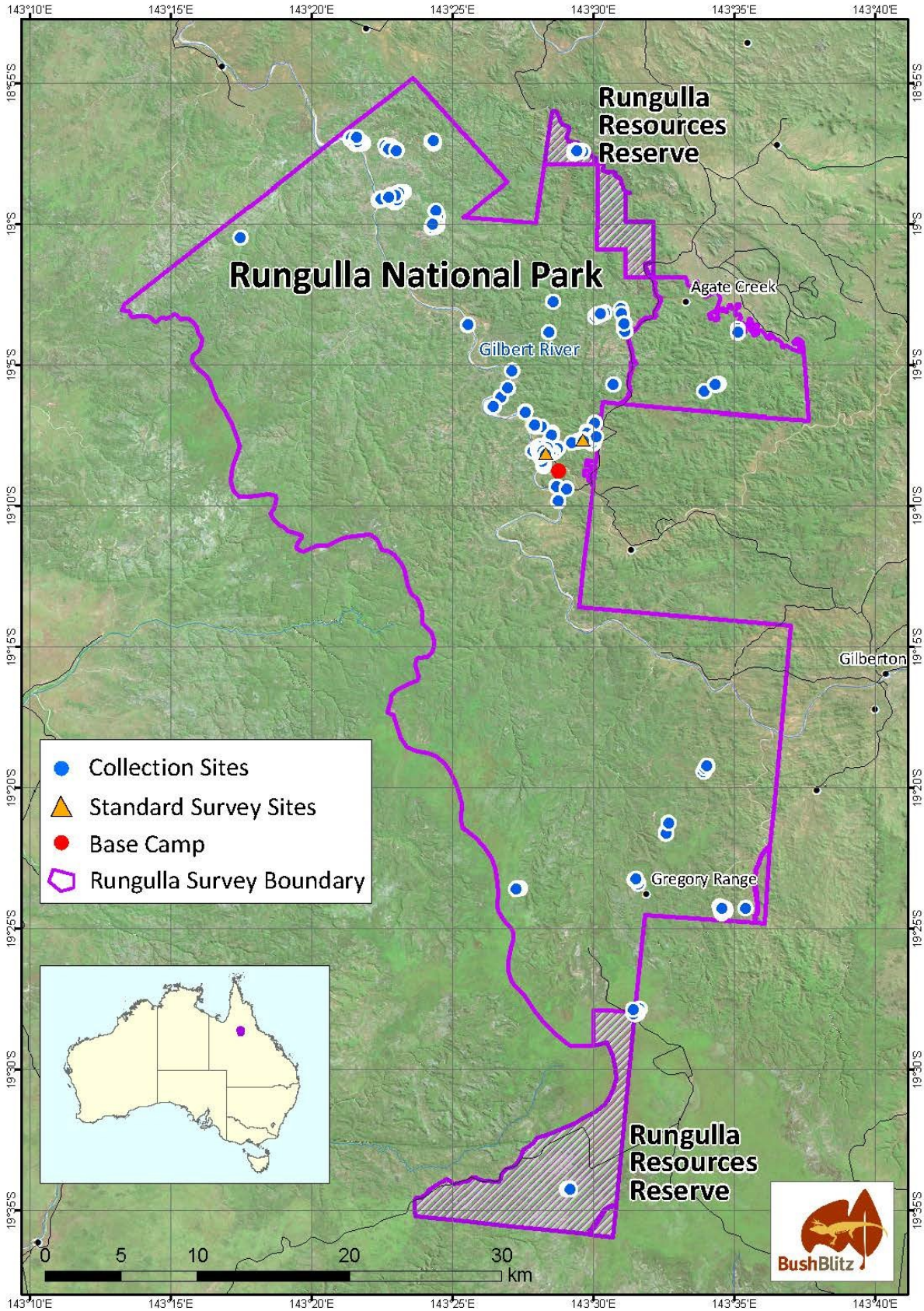
| Group | Family | Species | Common name |
|---|---|---|---|
| | Rubiaceae | *Richardia scabra* [b] | na |
| | Rubiaceae | *Spermacoce* sp. Bush Blitz Rungulla 1 | na |
| | Rubiaceae | *Spermacoce* sp. Bush Blitz Rungulla 2 | na |
| | Rubiaceae | *Synaptantha tillaeacea* | na |
| | Rutaceae | *Boronia bowmanii* | na |
| | Rutaceae | *Cyanothamnus occidentalis* | na |
| | Rutaceae | *Cyanothamnus warangensis* | na |
| | Rutaceae | *Drummondita calida* [c] | na |
| | Rutaceae | *Geijera salicifolia* | Broad-leaved Wilga |
| | Salicaceae | *Homalium brachybotrys* | na |
| | Sapindaceae | *Dodonaea filifolia* | na |
| | Sapindaceae | *Dodonaea hispidula* var. *hispidula* | na |
| | Sapindaceae | *Dodonaea oxyptera* | na |
| | Sapotaceae | *Planchonella pohlmaniana* | na |
| | Sapotaceae | *Sersalisia sericea* | na |
| | Solanaceae | *Datura ferox* [b] | Thorn Apple |
| | Solanaceae | *Solanum carduiforme* [c] | na |
| | Solanaceae | *Solanum crebrispinum* | na |
| | Stylidiaceae | *Stylidium eriorrhizum* | na |
| | Stylidiaceae | *Stylidium tenerum* | na |
| | Violaceae | *Afrohybanthus enneaspermus (Pigea enneasperma)* | na |
| | Violaceae | *Afrohybanthus stellarioides (Pigea stellarioides)* | na |
| | Vitaceae | *Causonis trifolia* | na |
| | Xanthorrhoeaceae | *Xanthorrhoea johnsonii* | Grass Tree |
| | Xyridaceae | *Xyris complanata* | na |
| | Zygophyllaceae | *Tribulopsis pentandra* | na |
| **Mosses** | Fissidentaceae | *Fissidens perobtusus* | na |
| | Leucobryaceae | *Campylopus* sp. Bush Blitz Rungulla 1 | na |
| **Fungi** | Auriculariaceae | *Auricularia cornea* | Hairy Wood Ear |
| | Auriculariaceae | *Auricularia* aff. *pusio* (undescribed) | Savanna Tripe Fungus |
| | Boletaceae | *Crocinoboletus* sp. Bush Blitz Rungulla 1 (undescribed) | na |
| | Boletaceae | *Tylopilus griseipurpureus* | na |
| | Corticiaceae | *Punctularia strigosozonata* | na |
| | Dacrymycetaceae | *Dacryopinax spathularia* | Fan-shaped Jelly Fungus |
| | Geastraceae | *Geastrum* sp. Bush Blitz Rungulla 1 (undescribed) [a] | na |
| | Polyporales incertae sedis | *Campylomyces tabacinus* | na |

| Group | Family | Species | Common name |
|---|---|---|---|
| | Gloeophyllaceae | *Gloeophyllum* sp. Bush Blitz Rungulla 1 (?undescribed) | na |
| | Gloeophyllaceae | *Gloeophyllum* sp. Bush Blitz Rungulla 2 (?undescribed) | na |
| | Hymenochaetaceae | *Coltriciella* sp. Bush Blitz Rungulla 1 (undescribed) [a] | na |
| | Hymenochaetaceae | *Coltriciella* sp. Bush Blitz Rungulla 2 (undescribed) [a] | na |
| | Hymenochaetaceae | *Fomitiporia* sp. Bush Blitz Rungulla 1 (undescribed) [a] | na |
| | Hymenochaetaceae | *Fulvifomes ?resinaceus* | na |
| | Hymenochaetaceae | *Phellinus* sp. Bush Blitz Rungulla 1 (undescribed) | na |
| | Irpicaceae | *Gloeoporus chlorinus* | na |
| | Irpicaceae | *Irpex flavus (=Flavodon flavus)* | Yellow Teeth |
| | Nidulariaceae | *Cyathus stercoreus* [b] | na |
| | Nigrofomitaceae | *Trichaptum* sp. Bush Blitz Rungulla 1 (undescribed) | na |
| | Omphalotaceae | *Gymnopus similis* | na |
| | Panaceae | *Panus* aff. *fulvus* | na |
| | Peniophoraceae | *Asterostroma cervicolor* | na |
| | Peniophoraceae | *Duportella tristicula* | na |
| | Phanerochaetaceae | *Phlebiopsis crassa* | na |
| | Polyporaceae | *Funalia* aff. *caperata* | na |
| | Polyporaceae | *Perenniporia* aff. *aurantiaca* (undescribed) | na |
| | Polyporaceae | *Perenniporia* sp. Bush Blitz Rungulla 1 (undescribed) | na |
| | Polyporaceae | *Polyporus arcularius (=Lentinus arcularius)* | Spring Polypore |
| | Polyporaceae | *Polyporus* aff. *thailandensis* | na |
| | Polyporaceae | *Pycnoporus coccineus* | Scarlet Bracket Fungus |
| | Polyporaceae | *Pycnoporus* sp. Bush Blitz Rungulla 1 (undescribed) | na |
| | Polyporaceae | *Trametes hirsuta* | na |
| | Polyporaceae | *Trametes marianna* | na |
| | Schizophyllaceae | *Schizophyllum commune* | Split Gill |
| | Sclerodermataceae | *Pisolithus albus* | White Dye-ball Fungus |
| | Trimorphomycetaceae | *Saitozyma podzolica* | na |
| | Ustilaginaceae | *Pericladium grewiae* | na |
| | Ustilaginaceae | *Triodiomyces ?altilis* | na |
| | Xylariaceae | *Daldinia eschscholzii* | na |

**a** Putative new species. **b** Introduced and/or pest species. **c** Listed as threatened under the *Nature Conservation Act 1992* (Queensland). **na** Not available.

# Appendix B: Collection sites

**Map B1 Map of collection sites**



# Glossary

| Term | Definition |
|---|---|
| ALA | Atlas of Living Australia |
| Biome | A major ecological community, extending over a large area and usually characterised by a dominant vegetation type. |
| Bioregion | A geographical area defined not by political boundaries but by ecological systems |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| EPBC Act | *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) |
| Funga | A collective term for all the fungi present in a region |
| Genus (plural genera) | A taxonomic category that ranks between family and species, consisting of related species (e.g. *Acacia*). |
| Host plant | A species of plant that is used by larvae of insects as food and a place to develop. |
| Introduced | Not indigenous; not native to the area in which it now occurs. |
| Lineage | A sequence of species each of which is considered to have evolved from its predecessor. |
| Pest species | A species that has the potential to have a negative environmental, social or economic impact. |
| Perennial | Any plant that lives for several years |
| Putative new species | An unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz. |
| QM | Queensland Museum |
| QPWS | Queensland Parks and Wildlife Service |
| Range extension | Increase in the known distribution or area of occurrence of a species. |
| Taxon (plural taxa) | A member of any particular taxonomic group (e.g. a species, genus, family). |
| Taxonomy | The categorisation and naming of species. The science of identifying and naming species, as well as grouping them based on their relatedness. |
| Threatened | Fauna or flora that are listed under Section 178 of the EPBC Act (or equivalent State legislation) in any one of the following categories – extinct, extinct in the wild, critically endangered, endangered, vulnerable, conservation dependent. |
| Type specimen(s) (holotype, syntypes) | The specimen (or set of specimens) on which the description and name of a new species is based. |
| Undescribed taxon | A taxon (usually a species) that has not yet been formally described and named. |
| UNSW | University of New South Wales |
| Vascular plants | A lineage of plants that possess well-developed veins (vascular tissue) in their stems, roots and leaves. Vascular plants include the majority of familiar land plants: flowering plants, ferns, conifers, cycads and fern allies, but not mosses, liverworts or algae. |
| Vouchers (voucher specimens) | Any specimen, usually a dead animal or preserved plant sample, that serves as a basis of study and is retained as a reference. |

# References

Chapman, AD 2009, Numbers of Living Species in Australia and the World 2nd edn, Australian Biological Resources Study, Canberra, accessed 13 September 2021.

State of Queensland 2020, Rungulla National Park and Rungulla Resources Reserve Management Statement 2020 [1.8MB], Queensland Parks and Wildlife Service, Department of Environment and Science, accessed 24 July 2023.