

# A flora and fauna survey of the Wyndham Sandy Creek Nature Refuge near Mt Garnet in north Queensland

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## Abstract

The North Queensland Natural History Group conducts flora and fauna surveys of properties using the volunteer efforts of members. Here, we report on a survey of the western half of Wyndham Sandy Creek Nature Refuge near Mt Garnet over six days in November 2017, with motion-sensor cameras left in place until January 2018. The vegetation, reptiles and amphibians present in six 2-ha plots in granite landscapes were assessed, incidental observations noted, and ten motion-sensor cameras left in place for more than two months. We identified variation in vegetation on granite substrates associated with slope and rock cover, and recorded 90 species of woody plant, 48 birds, fourteen reptiles, six amphibians and seven mammals. Sixteen faunal species were detected in images from motion-sensor cameras including six not otherwise recorded. Four plant species recorded are strongly associated with an area of endemism centred on Irvinebank, two of them being listed as threatened. Prevalence of one of these, the leguminous shrub Large-flowered Lamprolobium (*Lamprolobium grandiflorum*) is particularly noteworthy as it has a highly restricted range and is listed by the IUCN as Endangered. Wyndham Sandy Creek is the first conservation reserve from which the species has been recorded. This survey demonstrates the value of even short-term surveys conducted and recorded within a systematic framework. A professionally prepared video of the survey can be viewed at <https://mynortherngulf.org/wildlife-management-2/> (select "The Pinnacle Field Weekend").

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## Introduction

As a core part of its activities, the North Queensland Natural History Group (NQNHG) periodically undertakes flora and fauna surveys of leasehold or private properties in the region at the invitation of lessees, managers or owners. In this

and some other cases, these have been coordinated and supported by Northern Gulf Resource Management Group's Wildlife Management Project. Activities are advertised

through NQNHG's network and members and friends camp on-site for several nights.

The value of these surveys is high, as there are few other organisations and government departments doing surveys on leasehold and private properties in the region so knowledge of their fauna and flora is relatively poor. While findings from previous surveys may have been submitted as spot records to the Queensland Government's database of fauna (WildNet, <https://data.qld.gov.au/dataset?tags=WildNet>) or the Atlas of Living Australia (<https://www.ala.org.au/>), reports describing the survey methods and search effort, and providing local syntheses, have not been published. To monitor the state and trends of fauna across our landscape it is important that the survey methods and search effort are known so that surveys can be compared.

In this paper we provide a first published report arising from one of these surveys, that of Wyndham Sandy Creek Nature Refuge surveyed in November 2017.

## Methods

The Refuge (17°33'S, 145°7'30"E; Fig. 1) is leasehold land 14 km north of Mt Garnet in north Queensland, Australia. It is an IUCN Category VI reserve comprising 1,263 ha that was designated in 2009 (Protected Planet 2014-2018). It is sometimes referred to as "The Pinnacle", referring to Excelsior Pinnacle (Fig. 2), a central feature of the Refuge.

NQNHG surveyed Wyndham Sandy Creek from 9–14 Nov. 2017, concentrating on the western half of the refuge centred on Excelsior Pinnacle (Fig. 1) and this report relates only to that western portion. Mean annual rainfall at Mt Garnet is 829 mm with an average of less than 25 mm falling in each of the six months from May to October inclusive. However, 172 mm of rain was recorded in the October just prior to the survey ([www.bom.gov.au](http://www.bom.gov.au), viewed 6 Oct. 2018).

### Study area

The western half of the Wyndham Sandy Creek Nature Refuge comprises the upper parts of the Rankin and Wyndham Creek catchments (Fig. 1) which flow generally south to merge and eventually join the Herbert River. The northern boundary of the Refuge is the Great Dividing Range (Fig. 3) at elevations of about 800 m ASL with peaks to 830 m, with the study area sloping southwards

to 740 m. Excelsior Pinnacle (Fig. 2, 836 m) is isolated from the Great Divide by 1.3 km.

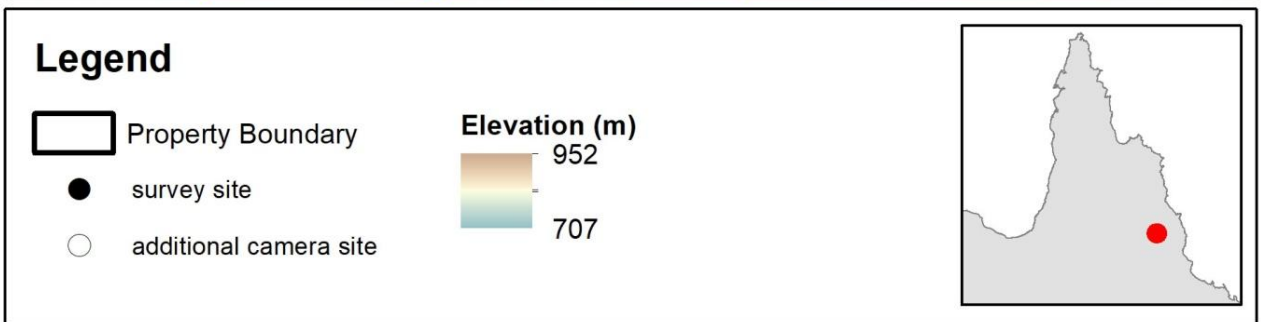
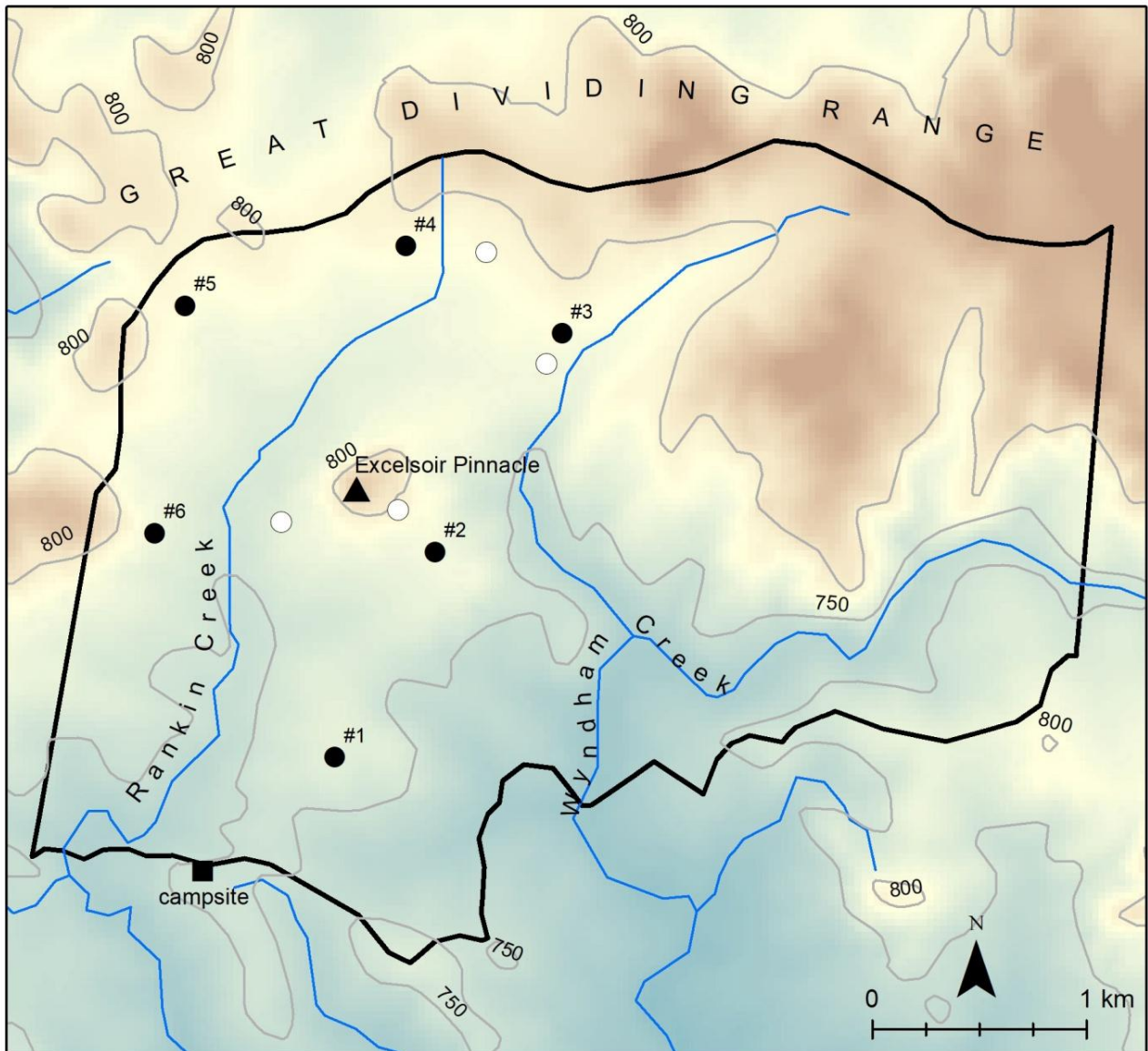
Most of the study area is underlain by granite, with two types present in plots (Table 1). Granite was obvious in form of emergent boulders in many places both on peaks (Fig. 3 is an extreme case) and in incised gullies, but in places in the north in particular it appears to be overlain by infertile Tertiary colluvium which was apparently shallow and of granitic origin as suggested by Regional Ecosystem mapping. A smaller area in the south of the study area have gravelly soils on Hodgkinson Province metamorphics.

Most of the study area is covered by woodland but with open woodland and shrubland on particularly skeletal sites, woody plant cover appearing to be more or less fully intact. The ground layer was generally in reasonable condition but with evidence of past and light current grazing and considerable colonisation by the non-native pasture plants Round-leaved Cassia (*Chamaecrista rotundifolia*; also known as Wynn Cassia) and Stylo (*Stylosanthes* sp.).

Five Regional Ecosystems (REs) have been mapped for the western portion of the Refuge (Table 2). The considerable majority of the area is mapped as a 70/30% mix of REs 9.11.3a and 9.11.10, with a lesser area of 9.12.20 around and to the east of Excelsior Pinnacle and 9.12.7a/9.5.16 confined to the north. However, these proved to be substantially inaccurate spatially and, in once case floristically – see Discussion.

### Field methods

Six 2-ha plots were selected by MSA on a previous visit to represent a cross-section of the granite country that is a feature of the Refuge – and far more widespread than RE mapping suggests. These were widely dispersed through the study area with nearest-neighbour distances of from 0.8 to 1.3 km (Fig. 1). Vegetation in each plot was described as the visually estimated % cover class of each of the woody plant species present. Rock cover was scored in the same manner. The height and cover class of vegetation layers – trees (canopy), small trees (sub-canopy or mid-layer), shrubs (woody plants generally less than 3 m tall) and herbaceous ground layer – was also estimated. Cover classes were <0.1%, 0.1 to 1%, 1 to 5%, 5 to 10%, 10 to 25%, 25 to 50%, 50 to 75% and 75 to 100%. The nature of the surface soil, slope, height of

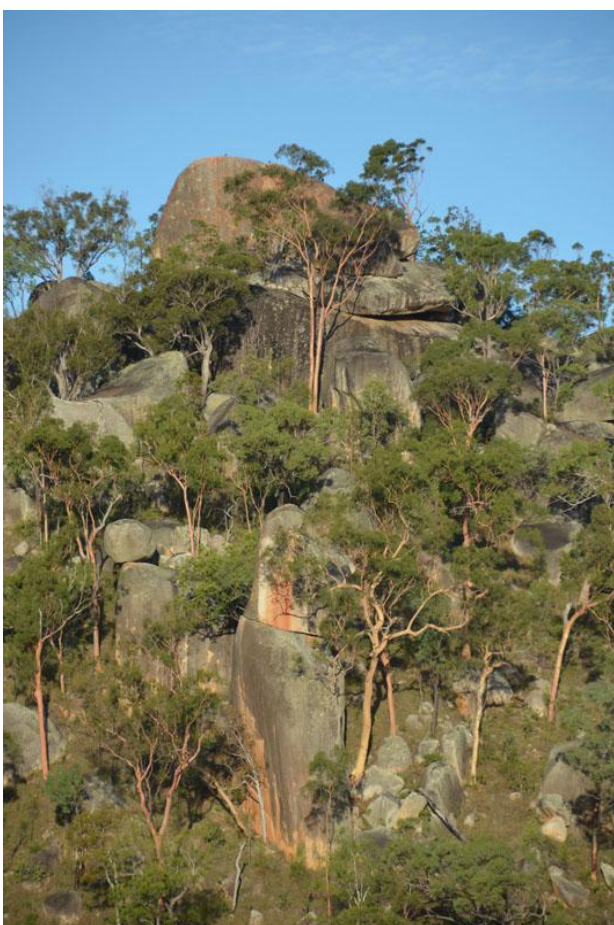


**Figure 1. Wyndham Sandy Creek Nature Refuge showing survey sites and key features.**  
Map prepared by Steve Murphy.



**Figure 2. Excelsior Pinnacle, Wyndham Sandy Creek Nature Refuge, viewed from the Great Dividing Range to the north-east.**

Excelsior Pinnacle is a boulderous granite outcrop although boulders are here concealed by trees. All landscape and plant photos are by Don Franklin.



**Figure 3. Unnamed granite peak on the Great Dividing Range, northern edge of Wyndham Sandy Creek Nature Refuge.**

The pinkish-barked trees are Lemon-scented Gum (*Corymbia citriodora* subsp. *citriodora*).

vegetation layers and evidence relating to land condition (e.g. weeds, fire, cattle, regeneration) were noted.

One diurnal and one nocturnal search for reptiles, amphibians and mammals was conducted in each plot, comprising 30 person-minutes of observation. Limited attendance meant we did not have the personnel available to conduct further diurnal or nocturnal searches nor conduct systematic bird surveys of the plots as has been usual on Natural History Group camps. Fauna detected during these searches and also observed incidentally were further inhibited by cool, windy weather, cool conditions being particularly inhibitory of reptile activity. Incidental sightings of additional and interesting vertebrate species and woody plants were noted.

Ten motion-sensor cameras (Reconyx HC550 Hyperfire) were deployed, one in each plot and four elsewhere within the Refuge (Fig. 1). Each was mounted on a sapling 25 cm above the ground pointing at a bait station (rolled oats and peanut butter) c. 1 m away. Five of these were deployed on 12 Nov. 2017 and five more on 13 Nov. 2017; all were retrieved on 21 Jan. 2018, 69 or 70 days later.

Lists of species observed are provided a supplementary Excel file. Plant scientific names follow Queensland Herbarium (2017), mammal names follow Menkhorst & Knight (2001), bird

**Table 1. Summary landform and vegetation statistics for six 2-ha plots on granitic substrates in Wyndham Sandy Creek Nature Refuge.**

All plots had underlying granite but the gentle slopes in Plots #4 and #5 may indicate shallow overlying Tertiary colluvium (an interpretation suggested by Regional Ecosystem mapping) probably of granitic origin.

Character	Plot #1	Plot #2	Plot #3	Plot #4	Plot #5	Plot #6
<b>latitude</b>	-17.5603°	-17.5516°	-17.5424°	-17.5387°	-17.5412°	-17.5508°
<b>longitude</b>	145.1239°	145.1281°	145.1334°	145.1268°	145.1176°	145.1163°
<b>granite type</b>	Excelsior	Excelsior	Black Prince	Excelsior	Excelsior	Black Prince
<b>rock cover</b>	25–50%	50–75%	5–10%	<1%	<1%	1–5%
<b>topography</b>	moderate slope and bouldery hill	moderate slope with incised stream and bouldery hill	gentle slope with deeply incised gully	gentle slope and minor gully	gentle to moderate slope and minor gully	gentle to moderate slope
<b>tree cover (est. height)</b>	10–25% (15 m)	10–25% (12–17 m)	10–25% (10–15 m)	10–25% (10–15 m)	25–50% (16 m)	10–25% (12 m)
<b>small tree cover (est. height)</b>	25–50% (3–5 m)	5–10% (4 m)	10–25% (3.5–7 m)	25–50% (4–6 m)	25–50% (3–3.5 m)	10–25% (4–5 m)
<b>shrub cover (est. height)</b>	25–50% (1–2 m)	25–50% (0.5–1 m)	10–25% (0.5–1 m)	25–50% (0.8 m)	25–50% (0.5–1 m)	10–25% (0.5 m)
<b>ground layer cover</b>	10–25%	1–5%	10–25%	50–75%	25–50%	25–50%
<b>main tree species</b>	<i>Eucalyptus ?cullenii</i> , <i>Corymbia leichhardtii</i> , <i>Callitris intratropica</i>	<i>E. pachycalyx</i> , <i>Cor.</i> <i>leichhardtii</i> , <i>Cal.</i> <i>intratropica</i>	<i>Cor.</i> <i>leichhardtii</i> , <i>E. pachycalyx</i> , <i>Cal.</i> <i>intratropica</i>	<i>Cor.</i> <i>leichhardtii</i>	<i>Cor.</i> <i>leichhardtii</i> , <i>Cor.</i> <i>ellipsoidea</i>	<i>E. ?cullenii</i> , <i>Cor.</i> <i>leichhardtii</i>
<b>number of woody species</b>	24	37	33	21	25	27

names follow Christidis & Boles (2008) and scientific names of reptiles and amphibians follow the Australian Faunal Directory (ABRS 2009 [with updates]).

#### Data analysis

For plots, granite types were identified using mapped surface geology in Queensland Globe (SoQ 2018) intersected with plot coordinates.

To illustrate the similarity of plots according to their woody plant composition, cover classes were converted to numeric scores (1,2,3 .... paralleling the classes above) and plots ordinated using Non-metric Multi-Dimensional Scaling with the Bray-Curtis similarity measure.

**Table 2. Regional Ecosystems (REs) mapped for the western portion of the Wyndham Sandy Creek Nature Refuge (SoQ 2018).**

RE	Short description (DEHP 2016)	Notes
9.5.16	<i>Eucalyptus tetradonta</i> +/- <i>Erythrophleum chlorostachys</i> woodland on Tertiary remnants	mapped as minor component (10%) intermingled with 9.12.7a
9.11.3(a)	<i>Eucalyptus cullenii</i> or <i>E. staigeriana</i> +/- <i>Corymbia clarksoniana</i> woodland on skeletal soils on metamorphic hills	mapped as intermingled with 9.11.10 (70/30%). Sub-type a. does not include <i>E. staigeriana</i>
9.11.10	<i>Eucalyptus cloeziana</i> , <i>Corymbia citriodora</i> subsp. <i>citriodora</i> , <i>E. portuensis</i> and <i>E. cullenii</i> mixed woodland on steep dissected hills on highly metalliferous metamorphic rocks	mapped as intermingled with 9.11.3a (30/70%)
9.12.7(a)	<i>Eucalyptus cullenii</i> +/- <i>Corymbia leichhardtii</i> +/- <i>C. erythrophloia</i> woodland on igneous rocks	variously mapped alone (a small area) or intermingled with 9.5.16 (90/10%)
9.12.20	<i>Eucalyptus pachycalyx</i> +/- <i>E. cloeziana</i> +/- <i>Corymbia leichhardtii</i> woodland on steep igneous hills	

## Results

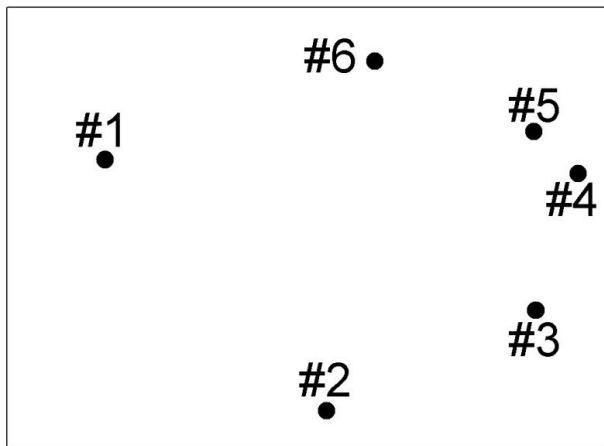
### Plots - vegetation

Fifty-seven woody plant species were recorded in plots, with an average of 27.8 species per plot (range 21 to 37; Table 1). Four species (*Acacia wickhamii* subsp. *cassitera*, *Corymbia leichhardtii*, *Persoonia falcata*, *Petalostigma pubescens*) were present in every plot, with *C. leichhardtii* (Fig. 4) rated as a dominant tree in every plot. All plots had at least 10% shrub cover and only one had more than 50% cover of grasses and forbs (the ground layer of Table 1).

Plots #1 and #2 had the most distinct woody plant composition (Fig. 5), both plots having considerable slope and boulder outcrops. The more gently sloping and less rocky Plots #3 to #6, and especially Plots #4 and #5 which were probably on Tertiary colluvium, showed greater similarity. Examination of floristic data suggests only limited specific drivers especially with regard to the similarity of Plots #4 and #5. The strongest overall driver of the pattern evident in Fig. 5 appears to be the high prevalence (cover >10%) of the tall shrub *Petalostigma banksii* in Plots #3 to #6 but its complete absence from Plots #1 and 2. Plot #1 was the only plot from which the tree *E. pachycalyx* and shrub or small tree *E. shirleyi* were absent. Plots #1 and #2 were the only ones from which the small trees *Melaleuca nervosa* and *M. viridiflora*, along



**Figure 4. Leichhardt's Yellowjacket (*Corymbia leichhardtii*) with its shaggy orange bark was widespread on granite soils in Wyndham Sandy Creek Nature Refuge and present in every survey plot.**



**Figure 5. Ordination of woody plant composition of six 2-ha plots in Wyndham Sandy Creek Nature Refuge.**

Ordination represents relative difference between plots, with those that are closer in the graph having a more similar woody plant composition. The graph axes have no meaning.

with *P. banksii*, were absent. (Note however that the Bray-Curtis similarity measure employed to generate Fig. 5 gives no weight to mutual absence of species, only relative abundance and presence-absence matches.) It is thus evident that, while the cover of shrubs and small trees was broadly similar across plots, these plant forms differed in composition with slope and rock cover (and thus drainage, perhaps), and this appears to be the major driver of the relative difference in plots shown in Fig. 5.

### Plants

In total, we identified 90 species of woody plant including 15 species of wattle (*Acacia* and *Vachellia*; Leguminosae [Mimosaceae]), 14 eucalypts (*Corymbia* and *Eucalyptus*; Myrtaceae) and eight species of Proteaceae (five *Grevillea* and one each of *Hakea*, *Persoonia* and *Xylomelum*).

Some particularly interesting plants were those endemic, or nearly so, to the Herberton-Irvinebank region. These included abundant Pumpkin Gum (*Eucalyptus pachycalyx* subsp. *pachycalyx*, Myrtaceae; Fig. 6; present in five survey plots) and Large-flowered Lamprolobium (*Lamprolobium grandiflorum*, Leguminosae [Fabaceae]; Fig. 7; present in four survey plots) as well as some individuals of the Mt Misery *Grevillea* (*Grevillea glossadenia*, Proteaceae; one plot) and the tiny wattle *Acacia longipendunculata* – northern population (Leguminosae [Mimosaceae], two



**Figure 6. The northern subspecies (*pachycalyx*) of Pumpkin Gum (*Eucalyptus pachycalyx*) is known only from the Irvinebank district.**

Photographed in Plot #2, Wyndham Sandy Creek Nature Refuge.

plots). Of these, Large-flowered Lamprolobium is listed by the International Union for Conservation of Nature as Endangered (Malcolm 2012) and known only from a small area between Mt Garnet and Lappa, while the Mt Misery *Grevillea* is listed as Vulnerable at state level (Queensland Herbarium 2017).

Two of the eucalypts found constitute minor but significant extensions to known ranges. River Red Gum (*E. camaldulensis* subsp. *acuta*), clearly distinguished from Forest Red Gum (*E. tereticornis*) by its shorter flower bud cap (operculum) along with bluer leaves, poorer growth form and bark colour, was moderately common along Rankin Creek. This is the first reported occurrence of the species in the Herbert River catchment (DCF unpublished data), though it is present along California Creek 17 km to the west of Rankin Creek on the other side of the Great Dividing Range in the Mitchell River catchment (DCF unpublished observation).



**Figure 7. Large-flowered Lamprolobium (*Lamprolobium grandiflorum*) is listed as Endangered by the IUCN. Photographed in Plot #2, Wyndham Sandy Creek Nature Refuge.**

The other eucalypt of note is Queensland Peppermint (*E. exserta*; Fig. 8; fruit seen; present in three survey plots), which was found widely though sparingly scattered on shallow granite rock pavements in the north of the Refuge. A stand is

known 11 km south-west of Mt Garnet (see Fig. 2 in Franklin & Sanders 2017). The Refuge stands are a 24 km range extension and, we believe, the northernmost known stand of the species anywhere.



**Figure 8. One of a number of Queensland Peppermint (*Eucalyptus exserta*) found in Wyndham Sandy Creek Nature Refuge by members of the North Queensland Natural History Group, this one in Plot #5.**

The occurrence in the Refuge is the northernmost recorded occurrence of the species which ranges widely to the south through much of Queensland and just into northern New South Wales.



We were treated to a fine show of flowering by the Tabletop Wattle (*A. wickhamii* subsp. *cassitera*;

Fig. 9) and also the Flat-stem Wattle (*A. calyculata*; Fig. 10).



Figure 9. Tabletop Wattle (*A. wickhamii* subsp. *cassitera*) in flower in the Wyndham Sandy Creek Nature Refuge, 12 Nov. 2017.



Figure 10. Flat-stem Wattle (*Acacia calyculata*) was flowering well in the Wyndham Sandy Creek Nature Refuge in November.

## Fauna

During the 6-day survey and subsequent camera survey along with brief visits to set the survey up and clear the cameras, we identified 48 species of birds, fourteen reptiles, six amphibians and seven mammals; two further mammals, both rodents, were detected by motion-sensor camera but not certainly identified. Of these totals, seven mammal (four certainly identified), nine bird and two (possibly three) reptile species were detected in images taken by the motion-sensor cameras (e.g. Fig. 11), including three mammal, two bird and two reptiles species not detected during the long weekend (Table 3). Active diurnal plot searches yielded only three skink species (the rock-dwelling Jewelled Rainbow Skink *Carlia jarnoldae*, the tree-dwelling Elegant Snake-eyed Skink *Cryptoblepharus pulcher*, and the Slender Snake-eyed Skink *Proablepharus tenuis*), whilst spotlight plot searches yielded one gecko (Dubious Dtella *Gehyra dubia*) and the Cane Toad (*Rhinella marina*).

A Bearded Dragon (*Pogona barbata*) was sighted on a small tree in sandy country at night. This species is not commonly sighted in the far north of Queensland (or Australia) although there are numbers of historical records from the region. Moist conditions favoured amphibian activity, with

two frog species seen (Common Green Tree Frog *Litoria caerulea*, Ornate Burrowing Frog *Platyplectrum ornatum*) and a further three species heard (Bumpy Rocket Frog *Litoria inermis* [Fig. 12], Laughing Tree Frog *L. rothi*, Little Red Tree Frog *L. rubella*). One snake, the small nocturnal Carpentaria Snake (*Cryptophis boschmai*), was found late at night at the edge of a track.

Of interest among birds was a single Painted Button-quail (*Turnix varius*) detected by motion-sensor camera and readily identified among button-quail by its red eye – a species not so commonly recorded in north Queensland though perhaps locally abundant in drier open forests. One Australian Bustard (*Ardeotis australis*) was sighted amongst rocks near the base of the Excelsior Pinnacle, unusual habitat for this species. A single Rufous Fantail (*Rhipidura rufifrons*) observed in scarcely-developed riparian vine-thicket was a little unusual in such dry vegetation.

## Discussion

Our study demonstrates the value of semi-systematic surveys even on a small temporal and spatial scale (six plots plus incidentals over a long weekend). We have demonstrated that the Refuge contains four plants strongly associated with a restricted area of endemism centred on the



Figure 11. Rufous Bettong (*Aepyprymnus rufescens*) photographed by motion-sensor camera in the Wyndham Sandy Creek Nature Refuge.

**Table 3. Fauna detected in images by ten motion-sensor cameras deployed simultaneously for 69 or 70 days each.**

Camera numbers (#) correspond to plot nos.; additional cameras are indicated "x".

Species	Cameras	Total cameras	N.o.D.*
<i>Mammals</i>			
Common Brushtail Possum, <i>Trichosurus vulpecula</i>	#3,6,x	3	x
Rufous Bettong, <i>Aepyprymnus rufescens</i>	#3	1	
kangaroo, <i>Macropus</i> sp.	#1	1	
Black Wallaby, <i>Wallabia bicolor</i>	#1,2,3,4,x,x	6	x
rat, possibly Pale Field Rat, <i>Rattus tunneyi</i>	x	1	x
unidentified small rodent	#4	1	
Pig, <i>Sus scrofa</i>	#5,6,x	3	
<i>Birds</i>			
Common Bronzewing, <i>Phaps chalcoptera</i>	#3,4,x	3	
Squatter Pigeon, <i>Geophaps scripta</i>	#3,4,5,x	4	
Peaceful Dove, <i>Geopelia striata</i>	x	1	
Painted Button-quail, <i>Turnix varius</i>	x	1	x
Great Bowerbird, <i>Ptilonorhynchus nuchalis</i>	#3,x	2	x
Grey-crowned Babbler, <i>Pomatostomus temporalis</i>	x,x	2	
Grey Butcherbird, <i>Cracticus torquatus</i>	x	1	
Australian Magpie, <i>C. tibicen</i>	#1,2,3,x	4	
Pied Currawong, <i>Strepera graculina</i>	x	1	
<i>Reptiles</i>			
Freckled Monitor, <i>Varanus tristis</i>	x	1	x
monitor sp., possibly <i>V. tristis</i>	x,x	2	
Frill-necked Lizard, <i>Chlamydosaurus kingii</i>	#1	1	x

\* N.o.D. = Not otherwise detected.

**Figure 12. Bumpy Rocket Frog (*Litoria inermis*) photographed at Wyndham Sandy Creek by Michael Anthony.**

This common species is often the only frog active as country dries out, remaining close to dwindling pools of water.



Herberton–Irvinebank area (see also Craven & Ford 2004; Ford & Conn 2013; Gleed & Franklin 2018). The Refuge is 15 km south-west of Irvinebank and on the extreme southern edge of the ranges that feature in the area. These plants include two species listed as threatened, both of which are poorly if at all represented in any other conservation reserve. We also documented a variety of other woody plants and animals.

Doubtless many more species remain to be detected, as shown for fauna by additional detections using motion-sensor cameras in the two months following our camp-out. Motion-sensor cameras are a significant enhancement to general fauna surveys not only to detect additional species for relatively little effort, but specifically to detect cryptic species that might otherwise not be found regardless of effort (e.g. Jackson & Vale 2016; Ball & Mitchell 2018).

Regional ecosystem description and mapping (DEHP 2016, SoQ 2018) for the western portion of the Refuge (our study area) is problematic on three counts. First, it shows most of the study area as having metamorphic surface geology (REs 9.11.3a/9.11.10; Table 2), including three of our plots, and this is not correct. Nor is it consistent with surface geology mapping in SoQ (2016) which shows only the southern c. 40% of our study area as Hodgkinson formation metamorphics and the remainder as granite, this being broadly concordant with our observations. Secondly, though we believe we identified Tertiary sandsheets overlying granite in the north of our study area, the corresponding RE (9.5.16; Table 2) lists *E. tetradonta* (Darwin Stringybark) as dominant but we did not find this species. Instead, these sites featured Leichhardt's Yellowjacket (*C. leichhardtii*) and high shrub cover (*Acacia*, *Petalostigma*), and Queensland Peppermint (*E. exserta*) also appeared associated with these sandsheets though at low density. Third, RE descriptions accord no special status to the stands of Pumpkin Gum (*E. pachycalyx* subsp. *pachycalyx*) that were widespread on granite in the area. The only possible corresponding REs (9.12.7b and 9.12.20) both have a listed biodiversity status of 'No concern at present', which fails to reflect the restricted occurrence of Pumpkin Gum and associated woodland to granite hills in the Irvinebank area and its scarce representation in conservation reserves.

Wyndham Sandy Creek Nature Refuge is a Category VI nature reserve – the lowest category which allows for “sustainable use of natural resources” (IUCN n.d.), in this case low-intensity grazing. There was no obvious evidence that this grazing has interfered with woody vegetation (though long-term impacts are plausible), but the abundance of non-native pasture plants is not ideal and may be the legacy of more intense grazing in the past.

Surveys such as this contribute to our knowledge of the flora and fauna of north Queensland, especially in pastoral districts for which such surveys have been scant. They also provide valuable encounters with outlying areas and a learning opportunity for all regardless of experience and in a collaborative communal setting.

A professionally prepared video of the survey was sponsored by the Northern Gulf Resource Management Group and can be viewed at <https://mynortherngulf.org/wildlife-management-2/> (select “The Pinnacle Field Weekend”).

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