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First confirmed record of Chestnut-backed Button-quail *Turnix castanotus* in Queensland

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Abstract. The Chestnut-backed Button-quail *Turnix castanotus* is widely distributed in monsoonal tropical woodland but previously known only from the Northern Territory and Western Australia. Here we provide the first verified record in Queensland. We observed at least eight birds during October and November 2020 at Westmoreland Station, which is located in far north-western Queensland. These observations represent a significant (~215 km) easterly range extension and are the first confirmed records of this species for Queensland. Chestnut-backed Button-quail had gone undetected in Queensland likely owing to the difficulty in locating and identifying button-quail generally and the low number of birdwatchers in the region. A potential record made by W.R. McLennan in 1910 may represent a previously unreported record of this species in Queensland. Here we describe our observations in 2020 and the habitat where the species was recorded.

Introduction

Button-quail are an understudied family of birds, being difficult to detect reliably and observe in the field (Yarwood *et al.* 2019). The Chestnut-backed Button-quail *Turnix castanotus* is no exception, with the species not yet subject to targeted ecological research and, as a consequence, one of Australia's lesser-known button-quail (Webster *et al.* 2021). Chestnut-backed Button-quail are thought to be widely distributed through the monsoonal tropics of northern Australia in both Western Australia and the Northern Territory, as well as on Melville Island and Groote Eylandt (Marchant & Higgins 1993; Atlas of Living Australia 2020; eBird 2020). Their known distribution spans from the Dampier Peninsula in Western Australia (Menkhorst *et al.* 2017) east to Borroloola (Hill 1913; Barnard 1914) on the western side of the Gulf of Carpentaria in the Northern Territory. However, the eastern extent of their distribution is unclear. The most comprehensive text to date on the species, found in Marchant & Higgins (1993), noted Borroloola as the most easterly record, and the most recent comprehensive field guide to Australian birds (Menkhorst *et al.* 2019) indicated a contemporary distribution that reaches only the Roper River and Groote Eylandt in the east. In one reference (Olsen *et al.* 1993), a potential distribution extending into Queensland is depicted in a map but in the text Borroloola is noted as the eastern-most record.

This species was considered plentiful around Borroloola (Hill 1913) and the McArthur River (Barnard 1914) during specimen-collecting trips in the early 1900s, but recent records at the eastern extremity of its range have been few. Recent records of this species include a location 30 km south-west of Borroloola in 1985, Calvert Hills in November 1991 (Atlas of Living Australia 2020), and Pungalina-Seven Emu Wildlife Sanctuary in 2017 (Australian Wildlife Conservancy unpubl. data). The latter two represent significant eastern range extensions at the time of observation. Uncertainty in the species' eastern distributional limits may be related to difficulties associated with accessing habitat in this region of the Gulf of Carpentaria. Furthermore, the species is most vocal, and therefore detectable, during the wet season (Webster *et al.* 2021) when access is even more difficult.

Throughout their distribution, Chestnut-backed Button-quail are associated with savanna woodland with a sparse understorey and much grass cover, typically occurring on flat or undulating country with a rocky or gravelly substrate (Boekel 1976; Andrew 1992; Marchant & Higgins 1993; Ward & Young 2014). The autecology of this species is poorly documented but is likely similar to that of other button-quail.

Here we document an easterly range extension of ~215 km from the previously published eastern distribution limit of Borroloola (Marchant & Higgins 1993) and the first confirmed record of the Chestnut-backed Button-quail in Queensland. The habitat where the birds were recorded is described and the possibility of other suitable habitat within the state of Queensland is discussed. Additionally, we bring to light an unreported potential record of this species on Gregory Downs and Augustus Downs in Queensland, made by William McLennan in 1910 (McLennan 1913).

Study area and methods

Satellite imagery and spatial environmental data were studied to identify potentially suitable Chestnut-backed Button-quail habitat in Queensland. Based on our previous experience with the species in the Northern Territory, as well as expert opinion (N. Jackett & G. Swann pers. comm.), suitable habitat was described as areas that are topographically complex and support an open woodland vegetation community on a skeletal substrate. Habitat with these characteristics was located in Queensland using Queensland's Regional Ecosystem mapping system, Version 11.1 (Queensland Herbarium 2019), which classifies areas based on their bioregion, geology, landform and vegetation community. Suitable habitat was

identified on Westmoreland Station in the extreme north-west of Queensland, and we conducted field surveys to determine if Chestnut-backed Button-quail were present.

The observations were conducted on two separate days, 24 October and 15 November 2020. We traversed ridge-tops in areas that were suspected to be suitable habitat according to the habitat features present in satellite imagery and regional ecosystem mapping. The duration of each search was *c*. 3 hours. Whilst traversing the ridges, particular attention was paid to the ground-cover (grasses) and understorey layers. This was done to locate suitable Chestnut-backed Button-quail habitat, which we associated with widely spaced perennial grasses and the small shrub Quinine Bush *Petalostigma quadriloculare*, based on observations in the Northern Territory. Upon locating suitable habitat, the area was examined for platelets, the foraging scrapes created by button-quail, and a recording of the advertising *oom* of the species (see Webster *et al.* 2021) was played for 15 minutes using a portable speaker (JBL GO2, Harman International Industries, Stamford, USA). Careful observation was undertaken during the call-playback for any response to the recording.

At the site where Chestnut-backed Button-quail were observed, the habitat was described, including landform and substrate and identification of the vegetation for all strata. Collected vegetation samples were stored in paper envelopes and later identified using a range of keys and field guides (Milson 2000; Queensland Herbarium 2019; Centre for Australian National Biodiversity Research 2020).

Results

Chestnut-backed Button-quail were detected on the pastoral property Westmoreland Station in the Gulf of Carpentaria, Queensland (Figure 1), initially on the morning of 24 October and again on the afternoon of 15 November 2020. On the initial visit, call-playback using an advertising *oom* of the target species was attempted in an area of suitable habitat. After playing one series of advertising vocalisations (*c*. 35 seconds), a female Chestnut-backed Button-quail was heard replying. This bird continued to reply to the playback for 20 minutes before coming into view, when it was photographed and identification confirmed as a female Chestnut-backed Button-quail (Figure 2). On this occasion only one individual was observed.

Following this observation, several button-quail platelets and a roost were detected within ~20 m of the sighting. The platelets were made in the substrate of leaf-litter and coarse gravel, and measured ~12 cm in diameter (Figure 3a). A roost was detected at the base of a small tussock of perennial grass and comprised a small scratching ~12 cm in diameter and 20 faecal pellets (Figure 3b), similar to roosts of other button-quail species (PW unpubl. data). No other button-quail species was detected in this habitat, although two Red-chested Button-quail *T. pyrrhothorax* were detected on the lower slopes of the ridge in moderately dense Black Speargrass *Heteropogon contortus*. The Red-chested Button-quail were seen only in flight but their smaller size, in combination

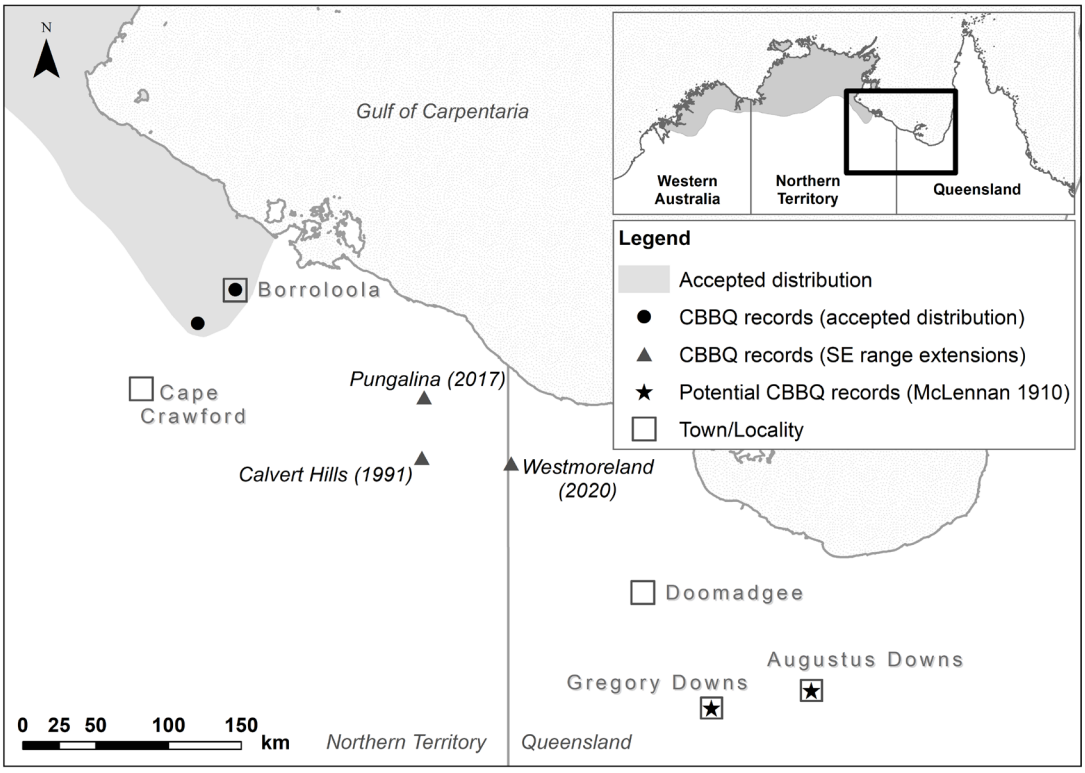

Figure 1. Map of the distribution of the Chestnut-backed Button-quail (CBBQ) (grey shading) from Hill (1913), Barnard (1914) and Marchant & Higgins (1993). Historic records of Hill (1913) and Barnard (1914) near Borroloola, and the 1985 record 30 km south-west (Atlas of Living Australia 2020) (black circles) represent the most south-easterly accepted records. Recent records on Calvert Hills Station (Atlas of Living Australia 2020), Pungalina-Seven Emu (Australian Wildlife Conservancy unpubl. data) and our observations on Westmoreland in Queensland (triangles) are further east. Potential observations made by McLennan in 1910 at Gregory Downs and Augustus Downs (McLennan 1913) are indicated by stars. SE = south-east.

Figure 2. Chestnut-backed Button-quail photographed on the initial visit 24 October 2020 on Westmoreland Station, Queensland: the first documented evidence of the species' occurrence in Queensland. Note the diagnostic features of this species, namely a large bill, yellow iris, and a chestnut back. Photo: P.T.D. Webster

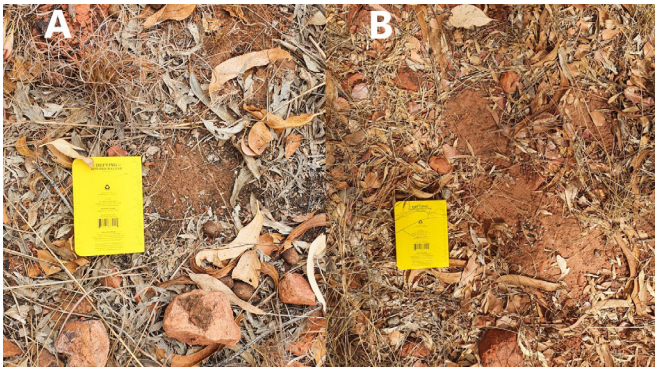

Figure 3. A platelet and roost found in the immediate area that a Chestnut-backed Button-quail was observed on Westmoreland Station, Queensland. (A) Typical button-quail platelet, a perfectly circular scratching with the substrate distributed evenly around the periphery of the scratching. (B) Typical button-quail roost, characterised by an accumulation of faeces in a platelet alongside a perennial grass tussock. Photos: P.T.D. Webster

with the orange-tinged flanks and grey-brown back, was sufficient detail to confirm their identification.

On the second site visit on 15 November, two vocal responses were heard at the same location where the first bird had been seen but the bird did not come into view during or after playing the advertising *oom* of the species. After leaving this specific site, a covey of seven Chestnut-backed Button-quail was detected and flushed 300 m further to the west of the initial detection. The birds were seen only in flight but were immediately identifiable as Chestnut-backed Button-quail by their size, coloration and behaviour. They were medium-sized button-quail, smaller than the Painted Button-quail *T. varius* but larger than Red-chested Button-quail. In flight, they appeared a rich chestnut colour, which was most obvious on the back and rump. Several platelets and faecal pellets were detected in the immediate area of the flushed covey. The faecal pellets were of the same shape, size and consistency of those found at the initial site.

Our observations occurred atop a prominent low ridge that ran east–west, straddling the Northern Territory–

Figure 4. Habitat at the site where Chestnut-backed Button-quail were detected in October 2020 on Westmoreland Station, Queensland. Note the sparse canopy, rocky substrate and the areas of bare earth that are present. Photo: P.T.D. Webster

Queensland border. This landform is extensive in the Northern Territory but extends only a short distance into Queensland. There was a prominent change in vegetation on the ridge, with a more open canopy and sparser understorey and ground-cover. The habitat was broadly defined as open woodland on lateritic gravel and rock (Figure 4). The open canopy was composed of Darwin Stringybark *Eucalyptus tetrodonta* and Small-fruited Bloodwood *Corymbia dichromophloia*. There was a distinct low and sparse understorey dominated by Quinine Bush *Petalostigma quadriloculare* and Hop Bush *Dodonaea hispidula*. Ground-cover was moderately dense but with areas of bare ground present. It was comprised mostly of hummock and tussock perennials, with Curly Spinifex *Triodia bitextura* and Kerosene Grass *Aristida* spp. being dominant; annual grasses and forbs were present but were not a dominant feature. Other species that were present are presented in Table 1. Given that the timing of the observation and the habitat analysis were during the late dry season, some herbs and grasses were desiccated and lacked features necessary for identification. The substrate was composed of small-to-medium rocks ~5–30 cm in diameter, which were a prominent feature across the landscape. Areas of bare soil and leaf-litter were also apparent. This area is mapped as Regional Ecosystem 1.12.1x9 (Version 11.1), which is described broadly as low woodland on ranges and stony hills on shallow soils and red earths.

Discussion

The distribution and ecology of Chestnut-backed Button-quail are not well understood. It is not surprising that the species' occurrence in Queensland has gone undetected or unverified, given that the Gulf of Carpentaria is difficult to access and is not widely visited by birdwatchers. Our observations represent a significant eastward range extension and the first verified record of the species in Queensland.

Our observations occurred in open eucalypt woodland habitat with a mixture of perennial grasses and low shrubs on a rocky skeletal substrate. Though our understanding

Table 1. The plants recorded at the site of the Chestnut-backed Button-quail observations on Westmoreland Station, Queensland. Species are grouped into structural layers and dominant species are shown in bold.

Structural layer	*Species*	
	Common name	*Scientific name*
Canopy	**Darwin Stringybark**	***Eucalyptus tetrodonta***
	Small-fruited Bloodwood	***Corymbia dichromophloia***
	Darwin Woollybutt	*Eucalyptus miniata*
	Cooktown Ironwood	*Erythrophleum chlorostachys*
	Emu Apple	*Owenia vernicosa*
Understorey	**Quinine Bush**	***Petalostigma quadriloculare***
	Hop Bush	***Dodonaea hispidula***
		Acacia asperulacea
	Pink Turkey Bush	*Calytrix exstipulata*
	Joolal	*Terminalia canescens*
Ground-covers/grasses	**Curly Spinifex**	***Triodia bitextura***
	Erect Kerosene Grass	***Aristida holathera***
	Northern Kerosene Grass	*Aristida hygrometrica*
	Plume Sorghum	*Sarga plumosum*
	Silky Oil Grass	*Cymbopogon bombycinus*
	Wanderrie Grass	*Eriachne melicacea*
	Fire Grass	*Schizachyrium fragile*
		Yakirra muelleri

of this species' habitat requirements is limited, given the paucity of research undertaken on the species, the observations occurred in habitat similar to descriptions from early naturalists in the Northern Territory (Le Souëf 1902; Hartert 1905; Hill 1913; Barnard 1914). Our records suggest that throughout their distribution this species is likely reliant on the open eucalypt habitat described here, but more research is necessary. This type of habitat, though not extensive in the Gulf of Carpentaria region of Queensland, extends further east than where Chestnut-backed Button-quail were recorded in this report. The ridge where the observation occurred extends only 7.5 km east into Queensland before it drops into alluvial country at Settlement Creek. There is further potentially suitable habitat on another line of ridges to the south that extends >20 km east into Queensland and may represent more easterly suitable habitat.

We note that we are speculating that Chestnut-backed Button-quail are reliant upon open woodland on undulating terrain, which remains to be proven. There may be additional habitat types utilised by this species that differ from what is described here and in previous reports. An investigation into the exact habitat requirements is warranted, as it will enable a clearer understanding of this species' potential distribution. Furthermore, the impact of fire history on this species is not understood. The site where we recorded Chestnut-backed Button-quail in Queensland was burnt on three occasions in the period 2000–2019 (in 2007, 2009 and 2018: NAFI 2021). The impact of fire on distribution and occurrence of this species requires further research.

A potential record of the Chestnut-backed Button-quail in Queensland was made by William McLennan during a collecting trip in north-western Queensland during 1910. It is uncertain whether at the time McLennan had previous experience with this species or with other similar button-quail on which to base his identification. Certainly, later in his career he became very familiar with other species of button-quail (McLennan 1922). A letter from him to Neville Cayley (author of *What Bird is That?*) (McLennan 1913) alludes to observations made on Gregory Downs and Augustus Downs (Figure 1) but contains no further detail. The letter, which is held at the Queensland Museum Library, Brisbane, was uncovered by Mary Barram during unrelated research. In it McLennan (1913) wrote "Chestnut-backed Quail... occasionally noted at Augustus Downs on the Leichardt River; and Gregory Downs on the Gregory R.". McLennan's trip was on behalf of ornithologist William Macgillivray. In his synopsis of McLennan's expedition, Macgillivray (1914) made no mention of Chestnut-backed Button-quail from the Gulf Country of Queensland, only Little Button-quail *T. velox* and Red-backed Button-quail *T. maculosus.* Interestingly, McLennan's record was not mentioned in Cayley's publication (*What Bird is That?:* Cayley 1931) but the distribution was described as from

the Kimberley in the west to Arnhem Land in the east. If they are proven to be accurate, the reports by McLennan on Gregory and Augustus Downs may suggest that this species has or had a much wider distribution in Queensland than previously thought. Both of these properties support areas of open woodland that could be suitable habitat for the species. It appears that this report has gone unreported in the literature, and is not noted in any field guides nor in the Queensland Museum's atlas of frogs, reptiles, birds and mammals (Raven & Ingram 1991). It is possible that McLennan's reports were thought to be erroneous and therefore ignored, but it is also plausible that they have simply been overlooked. Detecting Chestnut-backed Button-quail on Westmoreland Station suggests that the reports made by McLennan may be accurate, given that similar savanna habitat extends further east into Queensland. Therefore, further investigation into the species' eastern distributional limits is warranted, particularly in the vicinity of McLennan's observations.

It is difficult to ascertain if our 2020 record of Chestnut-backed Button-quail represents a resident population or whether the species is a nomadic or vagrant visitor to Queensland. Our evidence in combination with McLennan's reports suggests that this population is resident in Queensland. Firstly, the habitat that supports this species in Queensland is consistent with descriptions of suitable habitat from the Northern Territory and Western Australia (Le Souëf 1902; Hartert 1905; Hill 1913; Barnard 1914; Marchant & Higgins 1993; Ward & Young 2014). This habitat type reaches its eastern extremity in Queensland before it is replaced by lower alluvial grassland in the Gulf Plains bioregion. Secondly, the species was detected during our two field surveys at the site, revealing that at least eight individuals were present and engaging in territorial and/or foraging behaviours. The first observation of a single individual occurred within the first 2 hours of searching on 24 October, and eight individuals were detected when revisiting the site on 15 November. The species was quickly and easily detected, suggesting that it may be common in the area. Thirdly, this species is thought to be a resident where it occurs in Western Australia (N. Jackett & G. Swann pers. comm.) and the Northern Territory (Marchant & Higgins 1993). A nomadic or potentially migratory ecology has been suggested for some species of Australian button-quail (Crouther & Crouther 1999) but the data to support this are minimal, and nomadism has not been suggested for Chestnut-backed Button-quail. Lastly, the discovery of a potential record of the species in Queensland (McLennan 1913) by an extremely skilled and experienced field naturalist (Mason & Pfitzner 2020) suggests that the species may have a much wider distribution than previously thought. We suggest that Chestnut-backed Button-quail should be considered resident in Queensland, though only in the extreme north-west of the state. The species has likely gone undetected because of the very low visitation of birdwatchers to the area and the difficulty in detecting and identifying button-quail. Visiting and local observers of the north-western Gulf Country of Queensland should be aware of the possibility of encountering this species. Given the uncovered reports by McLennan, further search effort is required in the north-west of the state to determine the extent of occurrence of the species in Queensland.

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References

Andrew, D. (1992). Observations of Chestnut-backed Button-quail. *Wingspan* **8**, 14.

Atlas of Living Australia (2020). Atlas of Living Australia. Available online: http://www.ala.org.au/page.

Barnard, G. (1914). Northern Territory birds. *Emu* **14**, 39–57.

Boekel, C. (1976). Ten months on Gove Peninsula. *Australian Bird Watcher* **6**, 231–245.

Cayley, N. (1931). *What Bird is That?* Angus & Robertson, Sydney.

Centre for Australian National Biodiversity Research (2020). EUCLID. Available online: https://apps.lucidcentral.org/euclid/text/intro/about.htm.

Crouther, M. & Crouther, K. (1999). Quail that go bump in the night. *Corella* **23**, 43–47.

eBird (2020). eBird: An online database of bird distribution and abundance. Available online: http://www.ebird.org.

Hartert, E. (1905). List of birds collected in North-western Australia and Arnhem-land by Mr J. T. Tunney. *Novitates Zoologicae* **12**, 194–242.

Hill, G.F. (1913). Ornithological notes, Barclay Expedition. *Emu* **12**, 238–262.

Le Souëf, D. (1902). Descriptions of birds'-eggs from the Port Darwin District, Northern Australia. *Emu* **2**, 85–96.

Macgillivray, W. (1914). Notes on some north Queensland birds. *Emu* **13**, 132–186.

Marchant, S. & Higgins, P. (Eds) (1993). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 2: Raptors to Lapwings.* Oxford University Press, Melbourne.

Mason, I. & Pfitzner, G. (2020). *Passions in Ornithology: A Century of Australian Egg Collectors*. Ian J. Mason, Canberra.

McLennan, W. (1913). Cayley's Birds of Australia: Form for Recording Field Notes. Queensland Museum Library, Brisbane.

McLennan, W. (1922). Diary of a collecting trip to Coen District Cape York Peninsula on behalf of H. L. White. State Library of Queensland, Brisbane.

Menkhorst, P., Rogers D., Clarke, R., Davies, J., Marsack, P. & Franklin, K. (2017). *The Australian Bird Guide*. CSIRO Publishing, Melbourne.

Milson, J. (2000). *Pasture Plants of North-west Queensland*. Department of Primary Industries, Brisbane.

NAFI (2021). North Australia & Rangelands Fire Information. Available online: https://firenorth.org.au/nafi3/.

Olsen, P., Chrome, F. & Olsen, J. (1993). *Birds of Prey and Ground Birds of Australia*. Angus & Robertson, Sydney.

Queensland Herbarium (2019). Regional Ecosystem Description Database (REDD). Queensland Department of Environment & Science, Brisbane.

Raven, R. & Ingram, G. (1991). *An Atlas of Queensland's Frogs, Reptiles, Birds and Mammals*. Board of Trustees, Queensland Museum, Brisbane.

Ward, S.J. & Young, S. (2014). A bird in the hand is not always easily identified: Description of downy chicks of Chestnut-backed Button-quail (*Turnix castanotus*) from Cobourg Peninsula, Northern Territory, Australia. *Northern Territory Naturalis*t **25**, 7–11.

Webster, P.T.D., Jackett, N.A., Swann, G., Leseberg, N.P., Murphy, S.A. & Watson, J.E.M. (2021). Descriptions of the vocalisations of the Chestnut-backed Button-quail *Turnix castanotus*. *Australian Field Ornithology* **38**, 137–144.

Yarwood, M., Weston, M. & Symonds, M. (2019). Biological determinants of research effort on Australian birds: A comparative analysis. *Emu - Austral Ornithology* **119**, 38–44.

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