

QUAIL THAT GO BUMP IN THE NIGHT

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Annual irruptions of quail and button-quail, mostly Red-backed Button-quail, have been observed at Eungella township, elevation 725 metres in the Clarke Range near Mackay, Queensland. The birds appear at night, usually after about 2200 hours, but they seem to move only on certain nights in thick fog with a little light rain. Over an eight year period, 200 individual birds of six species have been hand captured when attracted to lights. They were measured and banded, and released alive. Summarized morphometric data are presented. The paper covers observations of this phenomenon and discusses the possibility of a migration pattern. Some comparisons are made with reported similar occurrences overseas.

INTRODUCTION

Button-quail (largely Red-backed *Turnix maculosa*, but also Red-chested *T. pyrrhothorax*, and Painted *T. varia*) periodically irrupt at Eungella in relatively large numbers on some nights of the summer wet season. During an irruption on the night of 24 January 1995 neighbours travelled some 10 kilometres along a range road largely through rainforest without seeing any quail, but when they reached the lighted street in Eungella village, where bright tennis court lights were in use, hundreds of birds were clustered on the ground. It was necessary for one person to walk ahead of the vehicle chasing and lifting birds from the roadway for approximately half a kilometre in the well-lit area. Next morning there were few to be seen although the remains of at least 17 different birds (13 Red-backed, 1 Red-chested, 2 Painted and 1 Brown *Coturnix ypsilophora*) were recovered from a 30 metre section of the footpath. Some were road-kills, others prey to Southern Boobook Owl *Ninox novaeseelandiae* or Barking Owl *N. connivens* and a feral cat (pers. obs.) which exploit the streetlighting for hunting. As far as we can discover, large numbers of button-quail land only within the village and areas close to its lighting. Similar events, though sometimes less spectacular, have occurred in each of the years 1991 to 1998.

Irruptions of Red-chested Button-quail and occasional large populations of Red-backed Button-quail have been recorded in various parts of Australia (Marchant and Higgins 1993). Movements of button-quail in small numbers at night together with numerous other bird species have been reported (Sutton 1990; Marchant and Higgins 1993). However, large movement of these species at altitude in foggy weather has not been reported in Australia, although the phenomenon is known in Africa (Backhurst and Pearson 1992) and other countries (McClure 1984).

STUDY AREA

The village of Eungella (21°08'S, 148°29'E) is situated approximately 80 kilometres west of the coastal city of Mackay, Queensland, at an altitude of 725 metres a.s.l. in the rainforest covered Clarke Range

(Fig. 1). To reach Eungella the road travels west from Mackay through the sugar-cane growing areas of the Pioneer River and its tributaries. The flat land in the valley becomes progressively more confined by the low foothills as the road proceeds westwards, until just west of the township of Finch Hatton where the terrain climbs very steeply from 60 metres to 725 metres altitude up the escarpment to a saddle in the Clarke Range. The settlement of some 50 houses is spread along the edge of the escarpment in this saddle. At its highest point the range reaches 1259 metres a.s.l. at Mt William about 25 kilometres north from the village.

As one approaches through the valley at night, the lights of the village can be seen from a distance of more than 30 kilometres on clear nights. Frequent dense fogs are a feature of the edge of the range and on such nights the lights appear as a reflected glow when seen from the valley below. The light is augmented by a floodlit tennis-court which is only 100 metres from the steep sides of the range. Surrounding the court is an area of mown parkland forming a convenient landing pad for birds (and, at times, helicopters)

METHODS

The birds are mostly caught using a hand held net and torch, although some are so dazed they can be caught by hand. Typically they begin to arrive about 2200 hours, with numbers tapering off after 2400 hours. The button-quail do not call in flight as far as we can discern, but alert us to their presence by bumping on walls, windows and roofs. Inspection of the road outside our house then provides the best trapping under a street light. On some nights birds seem to be flying, landing and exploding in all directions. The percentage of the flock that one person can trap under these conditions is probably very low. Because it is almost impossible to predict when the quail will arrive, we have been unable to take advantage of offers of help from other people interested in the project.

Mist-nets have been trialled and abandoned as being far less efficient than hand netting in the limited time the birds are active; only a small number of birds and small bats were caught by this method. The very few birds netted were difficult and time-consuming to retrieve in the darkness. Removing small bats accidentally caught in the nets would try anyone's patience.

Birds were weighed, measured and in some cases photographed before release. Birds were sexed using a combination of plumage and weight (e.g. female Red-backed Button-quail have much more vivid colouration and are consistently 35 to 40 per cent heavier than males). Weights were determined with a Pesola spring balance, accuracy ± 0.5 g. Head measurements were obtained with Bergeon dial vernier callipers, accuracy ± 0.1 mm. A Toledo stopped stainless steel rule with accuracy of 1 mm was used to determine wing measurements.

It has been found essential that birds are released into the darkness facing away from the houselights or they continue to crash into walls, lighted windows and white ceilings.

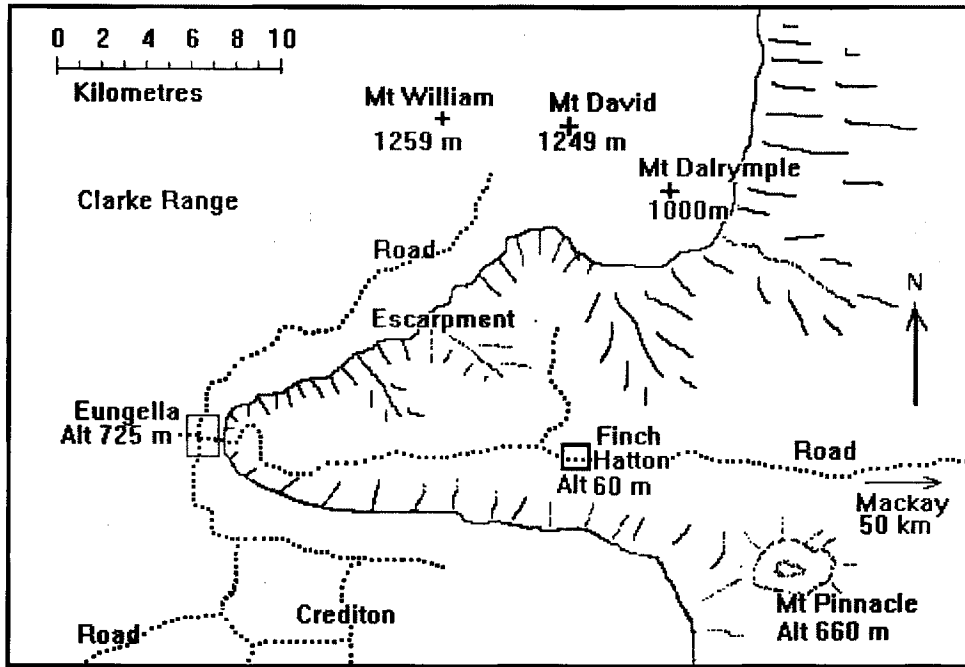


Figure 1. Showing topography of Clarke Range and Eungella Township.

RESULTS

Over the last 8 years we have caught 200 birds as shown in Tables 1 and 2.

The absence of data for the year 1993 does not indicate that the phenomenon did not occur, but rather that we were travelling interstate at the time. Our neighbours confirmed that large numbers of quail were seen during our absence.

It is known that button-quail have a very short juvenile stage, and this may explain why almost all birds captured were already in adult plumage and were recorded as age 1+. A female Red-backed Button-quail found dead after the night of 24 January 1995 revealed on dissection, a convoluted oviduct and granular ovaries (10 x 5 mm) i.e. it was in breeding condition.

Tables 3, 4, 5 and 6 (see page 46) show some of the data obtained from banding to date.

The data presented are reasonably comparable with that of Marchant and Higgins (1993) but comparison is limited by the use of museum specimens for much of their data.

Standard Deviation is shown only for Red-backed Button-quail where a substantial sample number could be

tested. For the other birds, where only smaller samples were available, mean and range are given.

DISCUSSION

Although we have been keeping notes since March 1990, we have not yet solved the question of what triggers these influxes of quail. They are associated with the wet season, mainly in January and February, with a few events in March and April and one in May of 1995. They are usually, but not always, preceded by the first period of heavy monsoon rain following a dry winter (e.g. 70–100 mm in a few days) in the lowlands rather than on the range. We have been unable to detect any correlation between the timing of these flights and phases of the moon as shown on the calendar.

Still nights, with very thick fog (visibility sometimes down to 5 metres) and a little drizzly rain are common at Eungella. On a very few such nights a great stirring of disoriented flight by a fascinating array of birds takes place. When these conditions occur we watch for a probable influx of quail, starting at around 2200 hours. As well as the quail, Magpie Geese *Anseranas semipalmata*, Wandering Whistling Ducks *Dendrocygna arcuata* and

TABLE 1
Number and sex of quail caught at Eungella over the 8 year period.

Species	Male	Female	Unknown	Total
Red-backed Button-quail <i>Turnix maculosa</i>	99	55	2	156
Red-chested Button-quail <i>Turnix pyrrhоторax</i>	6	8		14
Painted Button-quail <i>Turnix varia</i>	6	8	1	15
Little Button-quail <i>Turnix velox</i>		1	1	2
King Quail <i>Coturnix chinensis</i>	4	3		7
Brown Quail <i>Coturnix ypsilophora</i>	3	2	1	6

TABLE 2

Species, sex and numbers of quail caught on specified dates. M = male; F = female; U = sex unknown.

Date	Red-backed	Red-chested	Painted	Little	King	Brown	Total
26/1/90	7M, 4F, 2U	1M, 1F		1F, 1U			17
1/1/91	1M						1
9/1/91	6M, 4F						10
13/1/91	3M, 1F		1F				5
14/1/91	10M, 5F		1F		1M		17
15/1/91	6M, 6F		1F			1F	14
16/1/91	1F		1F				2
17/1/91	1M						1
19/1/91						2M	2
30/1/91						1M	1
11/3/91	2M, 1F				1F		4
4/4/91	3M, 4F				1M		8
15/2/92	1M						1
2/3/92	4M, 4F						8
19/1/93		1M					1
20/1/93		1M					1
13/1/94	6M, 1F	1M			1F		9
15/1/94	1F						1
31/1/94			1F				1
6/2/94	5M, 1F	1F	3M		1M		11
8/2/94	7M, 2F	3F	1M				13
10/2/94						1F	1
16/2/94			1M				1
18/2/94		1M					1
7/3/94	1M					1U	2
5/5/94					1M		1
6/5/94	1M, 1F						2
14/5/94	1F						1
16/5/94	1M						1
23/1/95	1M		1F				2
24/1/95			1M				1
1/2/95	1M	1M, 1F					3
2/2/95	1M	1F					2
23/2/95	1M						1
3/4/95	1M						1
14/3/96	13M, 3F	1F					17
28/1/97	6M						6
11/2/97	2F		1U				3
30/12/97	1M						1
31/12/97	4M, 7F						11
18/1/98	4M, 5F		2F				11
18/4/98	1M, 1F				1F		3
TOTAL	156	14	15	2	7	6	200

Plumed Whistling Ducks *D. eytoni*, Australian Wood Ducks *Chenonetta jubata*, Black-winged Stilts *Himantopus himantopus*, Nankeen Night Herons *Nycticorax caledonicus* wheel within the low clouds, wildly calling but invisible. One night we heard Common Greenshank *Tringa nebularia*, and another night calls like shorebirds (possibly oystercatchers *Haematopus* spp.), but these remain a mystery of the fog. Occasionally ducks and geese may land briefly on roofs and roadways. A Spotless Crake *Porzana tabuensis* and a White-browed Crake *P. cinerea*, Buff-banded Rail *Gallirallus philippensis* and Superb Fruit-Doves *Ptilinopus superbis* have also been caught on nights when quail movements occurred.

The quail crash into lighted windows and walls usually without causing themselves any serious injury. Once on the ground they are disoriented and are fairly easily caught using a hand net. Street lights attract large numbers of the birds. Unfortunately, feral cats and owls quickly become aware of their presence, and their predation is evident by small piles of feathers next morning.

By far the most common quail caught is the Red-backed Button-quail (156 birds out of the total of 200 caught in the eight year period). Red-chested Button-quail are regular visitors but in much fewer numbers. Only two Little Button-quail *Turnix velox* have been seen.

Brown Quail are more or less permanent residents, and Painted Button-quail are seen in all the summer months. Few Brown Quail are found at night, and Painted Button-quail are caught in low numbers. At infrequent intervals, King Quail are trapped during darkness but very rarely seen in daylight.

Male Red-backed Button-quail are generally more timid, slower and less wiley than females. Females are brighter in colour, heavier, more active and tend to struggle more vigorously in the hand, being more alert to the presence of the hunter. When alarmed, females fly further than males before landing. Morris and Kurtz (1977) noted similar characteristics in Red-chested Button-quail causing a bias in the sex ratio of birds caught for banding. We have

TABLE 3

Data collected for Red-backed Button-quail *Turnix maculosa*.

	Weight		HB		WL	
	Male	Female	Male	Female	Male	Female
Mean	33.3	46.1	30.9	33.3	70.1	77.1
SD	3.05	4.99	1.02	1.30	3.59	3.26
Range	27-39	36-60	28.4-33	31.2-39.5	60-78	67-82
n	97	53	97	33	96	33

Weights are shown in grams. HB = Head plus bill length in millimetres; WL = wing length (flattened straightened wing, maximum chord) in millimetres; 'n' is the number of individuals in the sample.

TABLE 4

Data collected for Red-chested Button-quail *Turnix pyrrhorostrax*.

	Weight		HB		WL	
	Male	Female	Male	Female	Male	Female
Mean	38.1	50.1	33.7	33.6	68.2	77.9
Range	35-42	45-55	30.4-32.1	32.8-34.6	64-71	75-82
n	4	8	4	8	4	8

Weights are shown in grams. HB = Head plus bill length in millimetres; WL = wing length (flattened straightened wing, maximum chord) in millimetres; 'n' is the number of individuals in the sample.

TABLE 5

Data collected for Painted Button-quail *Turnix varia*.

	Weight		HB		WL	
	Male	Female	Male	Female	Male	Female
Mean	70.8	93.9	37.4	40.1	95.5	99.6
Range	63-78	82-112	34.8-38.8	37.5-41.5	94-97	95-105
n	6	7	6	7	6	7

Weights are shown in grams. HB = Head plus bill length in millimetres; WL = wing length (flattened straightened wing, maximum chord) in millimetres; 'n' is the number of individuals in the sample.

TABLE 6

Data collected for King Quail *Coturnix chinensis*.

	Weight		HB		WL	
	Male	Female	Male	Female	Male	Female
Mean	36.3	39.3	29.2	29.2	70	70.3
Range	34-39	36-42	28.1-30	27.9-30	69-71	69-72
n	4	3	4	3	4	3

Weights are shown in grams. HB = Head plus bill length in millimetres; WL = wing length (flattened straightened wing, maximum chord) in millimetres; 'n' is the number of individuals in the sample.

trapped 99 male Red-backed Button-quail but only 55 females. Some of the button-quail but none of the other night-flying birds remain in the village when daylight comes. During the wetter months particularly when days remain damp and overcast and of generally low light intensity, small numbers of Red-backed and Painted Button-quail can be seen on the lawns of gardens, parkland and roadways through the village but the bulk of the night fliers move on almost immediately. Those that stay move about feeding quietly on seeds and small insects in the grass. On one occasion a female Red-backed was seen systematically eating a swarm of ants.

No birds banded at night (even in the Brown Quail and Painted Button-quail that we regard as resident species) have ever been recovered more than one or two days beyond the date of banding.

Birds moving in daylight may fall prey to Kookaburras *Dacelo novaeguineae*, Brown Goshawks *Accipiter fasciatus*, Grey Goshawks *A. novaehollandiae*, and Collared Sparrowhawks *A. cirrhocephalus* which regularly patrol this area. Kookaburras are more likely to take birds already injured (pers. obs.).

The limited success of mist netting for us may be due to the way the birds fly in the fog. When disturbed or released, the birds fly almost vertically upwards, and then descend just as abruptly some distance away; they do not fly horizontally in a way that makes mist netting productive. This flying characteristic leads us to speculate whether the birds are flying above the fog and simply drop into pools of light reflected from street lights, windows and tennis court lights. Why they are flying and where they were planning to go remains an interesting mystery.

Since we cannot see the birds in flight we cannot state with accuracy in which direction the flocks (if such they are) are travelling. Our general impression is that they move from north-east to south-west, i.e. up from the coastal valley to the inland tableland. The bulk of the birds land on the east side of the house; very few ever fly into windows from any other direction.

Interestingly, Peter Britton provided information on occurrences in East Africa where some comparisons can be made with our experience. At Ngulia in Kenya, the lights of a game lodge attracted huge numbers of nocturnal migrants on nights of heavy mist or light rain. In the years 1969–1990, 115 000 birds were banded (Backhurst and Pearson 1992). Amongst these were over 1 000 Harlequin Quail *C. delegorgui* and small but regular catches of Kurrichane Button-quail *T. sylvatica*. This lodge was built in an eastward facing dip in a range. Pearson and Backhurst (1976) commented that local topography was quite significant as other lodges in the region did not experience similar nocturnal groundings. The authors considered that the birds were caught on their annual north-south migration as they ascended the north-facing escarpment. The topography of the Clarke Range around the Eungella township has some similarities to that at Ngulia as may be seen from the map in Figure 1. A long escarpment stretches roughly north-east from the township, and the escarpment south of the township runs roughly east-west. The effect for any birds flying from the north would be to channel them along the northern escarpment to the Eungella township where they would find a low saddle giving them access to a high grassland plateau and thence to the Central Queensland plains around Nebo. Our experience suggests that some form of north-south movement is a distinct possibility. Ideal breeding areas exist to the north in coastal grasslands and canefields and Red-backed Button-quail have been seen in these areas. Whether or when they make a return journey is not known from our experience because the topography for south-north travellers would force them to take a different track far from the Eungella township.

The attraction of quail and other migrating birds to lights on certain misty mountain sites has been well reported from other countries. As well as the Kenyan phenomenon already discussed there are other reliable reports of native people using lights to attract birds which are then netted for food. McClure (1984) describes the way people in the Philippines and Malaysia use fires and pressure lanterns in low gaps in foggy mountains to attract quail and many other species to waiting nets. There is even a Biblical reference to quail flying in to an Israelite camp in enormous numbers where they were eagerly hand caught (Numbers 11: 31). Collisions of many species including quail with lighthouses are a well-reported phenomenon world-wide. Draffan, Garnett and Malone (1983) noted

sightings of many birds at Torres Strait lighthouses on misty, overcast nights.

In Australian ornithological literature there are a number of records that 'the various species of button-quail irrupt periodically'. These all seem to be sporadic events thought to be related to unusually favourable conditions of food supply or concentration of numbers due to drought and fires. Despite enquiries in similar geographic areas and habitats along the eastern coast of Australia, we have not uncovered observations directly comparable to ours where the irruption is an anticipated annual occurrence. Andree Griffin (pers. comm.) who has lived at Paluma for many years has not recorded any large influx of quail at that location which has some topographic similarities to Eungella. Observers who live in similar locations elsewhere e.g. Cliff Frith on the Atherton Tablelands and Don Seton on the Bunya Mountains report that they have not seen any comparable influxes although small numbers of these species do occur in their localities (pers. comm.).

It remains our hope that one of our banded birds will be retrapped when it reaches wherever it goes. Only then will we begin to understand whether or not the birds are migrating to some ancient pattern or simply flying blind in the fog. Unfortunately, quail are ideal snack size for owls, hawks, kookaburras and feral cats so the number of banded birds that finally complete the journey is probably very small. We live in hope.

We are convinced that only a little is known as yet of this interesting and secretive group of birds and would be very interested to hear of any similar occurrences in Australia.

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