

THE SUNBIRD

Volume 34 No. 1

ISSN 1037-258X

July 2004

PRESENCE AND DISTRIBUTION OF AUSTRALIAN BRUSH-TURKEYS IN THE GREATER BRISBANE REGION

DARRYL N. JONES, ROY SONNENBURG AND KRISTEN E. SINDEN

ABSTRACT

Between February 2002 and March 2003 Birds Queensland (BQ) initiated a survey of the presence and distribution of the Australian Brush-turkey *Alectura lathami* within the Greater Brisbane Region. Members and the public were invited to participate in the survey. One hundred and twenty six correspondents made a total of 242 reports. Brush-turkeys were reported from 73 Brisbane suburbs and nest mounds were commonly mentioned. Compared to a survey conducted in 1980-1981, the general range of the species has not changed greatly within the region but it is now present in many more suburbs, including some far from well-established breeding populations. Given the high rates of chick predation, the apparent expansion of this species within the suburbs of Brisbane is remarkable and would repay further investigation.

INTRODUCTION

Although currently widespread and abundant in Brisbane and environs (Woodall 2002), the Australian Brush-turkey *Alectura lathami* population has been markedly variable within this area over the last 50 years. During the 1950-60s, the species was regarded as shy and elusive and was known primarily from the D'Aguilar Range NW of the city (Vernon 1968). Vernon (1968: 29) also noted that it had formerly been "common close to the city years ago" but that by the mid-1960s was seen only occasionally in the outer western suburbs. Tellingly, Jack's (1938) earlier comprehensive account of the birds of the Mt Coot-tha reserve does not even mention the

species. This absence of Brush-turkeys from locations close to human habitation has been attributed primarily to hunting pressure, with the species being a favoured "game bird" during the first half of the twentieth century and before (Jones & Everding 1991).

Having been locally rare and unapproachable in the Brisbane region, the Brush-turkey made a rapid and dramatic recovery, apparently around the mid-to-late 1970s. Whether or not this was related to the enactment of legislation in the early 1970s providing protection to all native bird species (Jones & Everding 1991) is unclear. Nonetheless, the appearance of significant numbers of Brush-turkeys in numerous Brisbane suburbs, mainly adjacent to the forests of Mt Coot-tha, was sufficient to interest the then Queensland National Parks and Wildlife Service (Harris 1979). Peter Ogilvie's unpublished report of 1979 provides a valuable insight into the timing of the bird's arrival in these areas. For example, he reports individuals first being noted in Corinda in 1972, Indooroopilly in 1974, and Chapel Hill around 1979, with mounds and damage to gardens being recorded soon after (P. Ogilvie, unpublished data). The largest numbers of mounds reported at the time were from The Gap. Residents of this suburb indicated that they had been aware of relatively shy birds frequenting *Lantana* thickets in 1963 but that by 1979 the birds were noticeably tamer, some even drinking from milk bottles (P. Ogilvie, unpublished data).

About a decade later (1980-1981), the Wildlife Preservation Society of Queensland (WPSQ) conducted the Brisbane Wildlife Survey, an atlas-style survey of all species in the Greater Brisbane area (see Davies 1983). This survey found Brush-turkeys to be present in 27 Brisbane suburbs, and noted "It has clearly returned to much of its former range with the establishment and growth of gardens" (WPSQ 1983).

Earlier surveys by BQ (then Queensland Ornithological Society (QOS)) also provide useful background to the changing abundance of the species. The QOS 1973 annual bird count of the Brisbane area recorded only four individuals, all but one being from areas W of Ipswich (QOS 1974). In the 1979-80 Garden Bird Survey (Woodall 1995), Brush-turkeys are not mentioned specifically in the text, although small numbers were included in the tabulated data. By the 1999-2000 survey, sightings had increased by 22% by site and 12% by week, the species having the eighth largest increase during the previous 20-year period (Woodall 2002).

Jones & Everding's (1991) investigation of the ecology of suburban Brush-turkeys in the Brisbane area during 1989-90 also included information on their distribution. This was based largely on reports made by the public to the Queensland Parks and Wildlife Service. It provided a snapshot of the presence of the species at the time, as well as an assessment of the potential positive and negative influences affecting Brush-turkeys living within this human-dominated environment. They were reported from 39 suburbs, including several from locations or habitats unlikely to have traditionally supported the species (see Jones *et al.* 1995). It was speculated that at least some of these had resulted from intentional relocations by people (Jones & Everding 1991). Although this study found the species to be widespread and abundant in the area, a comparison of reproductive success of bushland versus suburban birds found the latter to be far less productive. Given the apparently poor survival of hatchlings in the wild (recently confirmed by Göth & Vogel 2002, 2003), it was suggested that the long-term survival of the Brush-turkey in suburban Brisbane should not be assumed (Jones & Everding 1991).

Birds Queensland initiated the present study to reassess the presence and distribution of the Brush-turkey in the Greater Brisbane Region. It was motivated in part, by the perception that, far from declining, the species' population was growing and spreading (Woodall 2002). The aims of the study were to obtain a detailed picture of the presence and abundance of the Australian Brush-turkey throughout the Greater Brisbane region during 2002-3, to compare these findings to earlier surveys and to assess whether its numbers and distribution had increased during the previous decade.

METHODS

Sightings of Brush-turkeys were invited from members of Birds Queensland and the public via announcements at the monthly meetings of BQ, notices in newsletters and over the media. R Sonneberg established an automated telephone hot-line and email address dedicated specifically to receiving reports of the sightings. People making reports were encouraged to record an exact location (preferably with GPS or longitude and latitude co-ordinates), the number and sex of birds, whether chicks or mounds were present, and any other relevant information.

The survey ran for 14 months from February 2002 to March 2003. All data was sent to the Suburban Wildlife Research Group at Griffith University for analysis. K. Sinden checked the locations and GPS information against a Brisbane geographical database using ArcView software.

RESULTS

A total of 126 correspondents provided 242 separate reports during the survey. Most (74 or 59%) correspondents made a single report while 24 made 2-7 reports. Three people contributed 11 (R. Sonnenburg), 13 (D. Muir) and 52 (I. Venables) reports from throughout the region. (A full list of correspondents and a detailed map of reports, including all grid and GPS data, has been included in the report provided separately for QOS (Jones *et al.* 2004).

Small groups of birds (between two and four, or 'several') were most often reported (147 or 61%) although 63 (26%) reports were of single birds. Birds 'sexed' by correspondents were most commonly male (20%), of unknown sex (13%) or female (7%) respectively. Group sizes ranged from 1 to '20+'. Only six reports (2.5%) mentioned the presence of chicks, although 62 (25%) reported a nest mound.

Reports were from a total of 49 postcode districts (4000 to 4503) and 73 specific suburbs (Table 1) ranging from the Brisbane CBD (Spring Hill, Petrie Terrace and Brisbane Botanic Gardens), to Ironbark (51 km W of the Brisbane GPO), Carindale (12 km E), Petrie (27 km N) and Cornubia (32 km S).

The greatest frequencies of reports were from locations known to support large breeding populations (suburbs adjacent to Brisbane Forest Park such as The Gap, Toowong, Indooroopilly, Chapel Hill and Brookfield). Those populations identified as 'recently established' during 1989-90 (Jones & Everding 1991) in or adjacent to Toohey Forest Park such as Tarragindi and Upper Mount Gravatt, and those in Cornubia had prospered, with birds apparently expanding into neighbouring suburbs.

The most significant finding was the presence of Brush-turkeys in suburbs far from any previously known breeding population. Brush-turkeys were reported from the N and SE of the region, as well as from inner suburbs not previously known to support the species. The largest areas where the birds have not established populations are rural districts to the east of the city in the Redlands Shire.

DISCUSSION

This survey shows that the Australian Brush-turkey now occurs in most areas of Brisbane, including the CBD with minimal habitat such as the Brisbane Botanic Gardens and the Queensland University of Technology Gardens Point Campus. Although the differing methods used in early

Table 1: Suburbs (listed by postcode) in the Greater Brisbane Area where the Australian Brush-turkey was reported between August 2002 and March 2003.

Northern Suburbs			Southern Suburbs		
Suburb	Postcode	Reports	Suburb	Postcode	Reports
Spring Hill	4000	6	Seventeen Mile Rocks	4073	3
Herston	4006	4	Jindalee	4074	3
Hamilton	4007	1	Chelmer	4074	1
Nundah	4012	12	Graceville	4075	1
Wavell Heights	4012	1	Sherwood	4075	3
Taigum	4018	1	Oxley	4075	2
Windsor	4030	1	Highgate Hill	4101	10
Kedron	4031	1	West End	4101	1
Chernside	4032	1	Tennyson	4105	1
Aspley	4034	3	Moorooka	4105	4
Carslisle	4034	1	Sunnybank	4109	4
Zillmere	4034	1	Pallara	4110	1
Albany Creek	4035	4	Nathan	4111	1
Alderley	4051	2	Algeria	4115	1
Stafford	4053	4	Holland Park	4121	1
Everton Hills	4053	3	Tarragindi	4121	5
Ferry Grove	4055	5	Upper Mt. Gravatt	4122	2
Ferry Hills	4055	1	Springwood	4127	1
Red Hill	4059	3	Shailer Park	4128	1
Kelvin Grove	4059	1	Cornubia	4130	1
Newmarket	4060	1			
Ashgrove	4060	2	Eastern Suburbs		
The Gap	4061	8	Carina	4152	2
Paddington	4064	5	Carindale	4152	2
Bardon	4065	5	Belmont Hills	4153	1
			Burbank	4156	1
Western Suburbs			East Brisbane	4169	1
Toowong	4066	17	Norman Park	4170	1
Auchenflower	4066	4	Balmoral	4171	3
St. Lucia	4067	9	Hawthorne	4171	1
Kenmore	4067	16			
Indooroopilly	4068	22	Other Suburbs - West		
Chelmer	4068	2	Goodna	4300	1
Taringa	4068	7	Carole Park	4300	1
Pinjarra Hills	4069	1	Ironbark	4306	2
Chappel Hill	4069	8			
Fig Tree Pocket	4069	1	Other Suburbs - North		
Brookfield	4069	5	Bray Park	4500	1
			Cashmere	4500	2
			Lawnton	4501	1
			Petrie	4502	1
			Whiteside	4503	2

surveys make comparisons with the present study problematic, it appears certain that the species has spread dramatically across Brisbane. It has successfully moved from former strongholds, such as the suburbs adjacent to Brisbane Forest Park, into others some distance from bushland refuges. For example, reports of Brush-turkeys from Taigum, Algeester, Springwood and Carole Park suggest that the birds are capable of travelling considerable distances through apparently inhospitable environments and breeding with a minimum amount of bushland.

The information from the 1980-1 Brisbane Wildlife Survey (WPSQ 1983) provides the most reliable data for comparison. Although Brush-turkeys were reported from almost twice as many suburbs during the present survey (73 versus 37) the range of the species appears not to have changed markedly. In 1980-1 birds were reported from Chermside and Nudgee in the N, Rochedale and Springwood to the S, and several sites W along the Brisbane River near Ipswich, as in the present study, and also Gumdale and Mt Cotton where no birds were reported in the present study. The Brisbane Wildlife Survey was an atlas-style study, with the Brisbane region being divided into grid-squares, all of which were visited (Davies 1983). In contrast, all or most reports made during the present survey were based on opportunistic sightings rather than any systematic coverage of the region.

The comprehensiveness of the survey and the conspicuousness of the Brush-turkey, suggest that an absence of the species from a location may be reliably interpreted as the species not being present, rather than simply being overlooked. If so, the main phenomenon to occur in the previous 20 years has been the movement of Brush-turkeys into previously unoccupied suburbs. The reporting of mounds from these new locations also indicates that breeding populations are present and not isolated individuals.

The causes of this expansion by the Brush-turkey into the Greater Brisbane Region have not been investigated but previous research suggests two likely influences. First, reproduction in this species depends upon the construction, maintenance and defence of large incubation mounds by an adult male (Jones 1988a, 1990). Although Brush-turkeys in the suburban environment are flexible in their choice of mound sites (Jones & Everding 1991) many locations are unsuitable or sub-optimal (Jones 1988b). Poorly sited nest mounds may be less attractive to females (Jones 1997), or increase egg and hatchling mortality (Jones 1988c, Göth & Vogel 2002). The vigorous defence of preferred mound sites by dominant male Brush-turkeys ensures that young males move well away from their natal mound in search of suitable sites for their own mounds (Jones 1990).

Recent years of drought in Brisbane have prevented successful reproduction (D. Jones unpublished data) by reducing food for females and preventing incubation mounds from generating sufficient heat (see Jones 1988a, b, 1995). The effect of these conditions has caused young males to move away from established high-density populations into the surrounding suburbs. The dense vegetation along the Brisbane River and its many tributaries appears also to have assisted the spread of the species.

Translocation by humans, mentioned explicitly by Jones & Everding (1991), is the second explanation for the expansion of the Brush-turkey. Although illegal, it is often done (see Craven *et al.* 1998). Survey respondents confirmed this suspicion in the case of Brush-turkeys, witnessing directly the release of birds. Their destruction of gardens is a typical reason given for translocation (Jones *et al.* 1993) and their removal is deemed more acceptable than euthanasia. Licenced pest control operators who capture and relocate specific animals for paying members of the public may also have contributed. Although they are required to release birds only in locations specified by the relevant wildlife agency, it is possible that at least some releases occur elsewhere.

The origin of particular populations is uncertain but the population in Toohey Forest Park, for example, almost certainly started through translocation. Before 1980 Brush-turkeys were unknown from this large suburban reserve. It consists of dry *Eucalyptus* forest and woodland without permanent water, and is incapable of supporting a wild Brush-turkey population because the leaf-litter would not support incubation (Jones 1988b). Since the arrival of Brush-turkeys in the 1980s (Catterall 1988) the population has grown and spread by establishing mounds in adjacent well-vegetated gardens. New mound sites were then located in the surrounding suburbs, with the result that Brush-turkeys are a common sight in the neighbouring suburbs of Tarragindi, Moorooka and Sunnybank.

Jones & Everding (1991) speculated that breeding in the suburbs risked an extraordinarily high rate of juvenile mortality due to predation (Jones 1988c). Göth & Vogel (2002) found that predation, especially by feral cats, was likely to remove almost all hatchlings. Only in areas where chicks can find refuge in dense thickets are survival rates above zero.

Given a high density of cats, a lack of protective thickets, the ubiquity of roads and traffic, and a variety of other negative features in Brisbane's suburbs, the continuing survival of the Brush-turkey appears noteworthy. That the population is growing and expanding its range locally is

remarkable, especially as many other species of native wildlife appear unable to cope with greater urbanisation (Sewell & Catterall 1998) and most other species of megapode are declining alarmingly (Jones *et al.* 1995). Detailed investigation of reasons for the success of the Australian Brush-turkey would be particularly valuable.

ACKNOWLEDGMENTS

We are extremely grateful to Birds Queensland for initiating and promoting this survey and to Ric Nattrass for his personal involvement and advice. We owe the greatest thanks to the many Birds Queensland members and private individuals who took the trouble to send in their reports. We also thank Peter Ogilvie and the Wildlife Preservation Society of Queensland for access to valuable unpublished data and information. We also acknowledge the many constructive comments of the manuscript provided by Philip Veerman.

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DARRYL JONES, Australian School of Environmental Studies, Griffith University, Nathan QLD 4111 D.Jones@griffith.edu.au

ROY SONNENBURG, 93 Hewitt Street, Nundah, QLD 4012

KRISTEN E. SINDEN, Environment and Parks, Brisbane City Council, Ann Street, Brisbane, QLD 4001