

Range expansion of the Crested Pigeon, *Ocyphaps lophotes*, in South Australia

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Abstract

While the Crested Pigeon is widely known to have expanded its range in south-eastern Australia during the 1920s and 1930s, in South Australia's pastoral areas the process began as early as the 1890s, extending into the northern and central Flinders Ranges during the first two decades of the 20th century. Occupation of the Gawler Ranges and other pastoral regions continued through the 1920s with a southerly expansion into the Murray Mallee taking place over that and the succeeding decade. By the early 1940s the species was common in most agricultural areas but its spread and increase in numbers continued into the southern Mount Lofty Ranges, southern Eyre Peninsula and the South-east up to the present day. Only Kangaroo Island and some desert areas remain to be occupied. Factors pertinent to the successful expansion of this species are discussed.

INTRODUCTION

The Crested Pigeon, *Ocyphaps lophotes*, (Temminck, 1822) was described from a specimen said to have been taken from west of the Blue Mountains in New South Wales (NSW). Schodde and Mason (1997) thought that it might have been collected near Bathurst but McAllan (2003) provided persuasive evidence that it was collected during Oxley's expedition along the Lachlan and probably on 3 July 1817 north-east of the present town of Booligal.

Gould (1840-1848) considered the Crested Pigeon to be one of the "loveliest in its tribe", "not surpassed in beauty by any other form from any part of the world". He added that it could only be

seen by "enterprising countrymen" "prepared to leave the haunts of civilised man and wander in the wilds of the distant interior". He himself had encountered Captain Sturt's (1833) "Crested Pigeon of the [Macquarie] Marshes" and recorded its breeding on the lower Namoi during his extended expedition into the interior of NSW in 1839. Gould stressed its relationship with wetlands of the inland rivers and added, presumably on the evidence of his brother-in-law, Charles Coxen, that it was only rarely seen on the Liverpool Plains on the western slope of the Great Dividing Range. Likewise Frederick Strange (1851), who collected for Gould, described its "habitation (as) the basin of the interior of Australia" and found it abundant on "the flooded flats that skirt the Murray and Darling Rivers".

Just over one half century later Mathews (1910-1911) had received records from north-western, northern and central Australia and gave its distribution loosely as "Australia generally", although with only one record from southern Victoria. North (1913-1914) was more precise in stating that it was "strictly an inland species and (was) not found in the coastal districts". In relation to South Australia (SA) he observed that it was to be found "in the northern parts" of the State.

Higgins and Davies (1996) outlined a continent-wide expansion of range for the species, which in eastern Australia extended to the east and south towards the coast during the 1920s and 1930s; further details were provided in their references. More recent summaries are provided

by Johnstone and Storr (1998) for Western Australia, by Cooper, McAllan and Curtis (2014) for New South Wales and by Dooley (2014) for Victoria. Historical changes in range and/or status across the continent are shown in Australian Bird Atlas maps by Blakers, Davies and Reilly (1984) and by Barrett *et al.* (2003) but none of those sources provided details of the Crested Pigeon's range expansion in SA.

This paper reviews the changed status and range of the species in SA from colonial times, through the early twentieth century, when it was regarded as chiefly a northern bird, to the present day when it is common through much of the State (SAOA 2008).

METHODS

I have sought records of the Crested Pigeon from reports of early exploration in SA, including those reported in colonial newspapers (when not replicated elsewhere), from documents and skin and egg clutch specimens in the South Australian Museum, Adelaide (SAMA) and from published observations in the *South Australian Ornithologist* and elsewhere.

RESULTS

The 19th century

In early colonial times in Australia the pigeon familiar to settlers was the widespread Common Bronzewing, *Phaps chalcoptera*. By contrast the Crested Pigeon was unknown other than to those who had travelled to "the distant interior" (Gould 1840-1848, 1865). Even after federation, North (1913-1914) agreed that "of all the Australian Pigeons no species is better known than the common Bronze-wing, for it is generally distributed over most parts of the continent", whereas the Crested Pigeon was still "strictly an inland species."

E.J. Eyre was the first to attempt to penetrate into the interior of SA and in his most extended exploration reached the northern extremity

of the Flinders Ranges before crossing Eyre Peninsula and finding his way to King George Sound in 1841. In his account Eyre (1845), made no reference to the Crested Pigeon, which he had seen earlier on his journey from Sydney to Adelaide (Anon 1838), but he did see "pigeons" beyond Crystal Brook and again west of Fowlers Bay. He also commented on their value as dietary items. Sturt's (1849) culinary judgement was that the Common Bronzewing was "a plump bird, and capital to eat", but the Crested Pigeon was not, "its flesh being neither tender nor well flavoured". Eyre's pigeons were most likely of the familiar and well flavoured variety.

Sturt (1833) took two Crested Pigeon specimens from the Murray and recorded them west of its junction with the Darling in 1830; at least one specimen survived for a century in the Museum of Edinburgh University (Stenhouse 1930). The earliest fully documented records of the Crested Pigeon in SA were among 267 bird skins sent from the Province in 1843 to the British Museum by Governor George Grey (AB personal data). The pigeon specimens were from the vicinity of the River Murray (BMNH 1843.7.14.15 & BMNH 1843.7.14.16). Other early reports also came only from the Murray, between the junction with the Darling (Sturt 1833), the great bend (Gould 1840-1848, Cleland 1937) and Moorundie south of present day Blanchetown (Angas in 1847, see Cleland 1946, Hamilton 1848). A newspaper item reported on the bird life seen from a paddle steamer, "ducks, teal, bronze-winged pigeons, parrots and the beautiful crested pigeon of the Murray" (Cadell 1853). The SAMA has a clutch from Pudnooka near Morgan (W. White in 1863, B3726) and another clutch from Bookpurnong near Loxton in 1880 (B29775). A possible early record from near Wellington is mentioned below.

F.W. Andrews collected Crested Pigeon specimens from around the Murray/Darling junction in 1865 (SAMA records; AB personal data) but it was not among over 65 species he obtained in the Gawler Ranges between 1871 and 1883 (Black 2014). Moreover the explorers

Hack (1857) and Bonnin in 1862 (Bonnin 1907) had not seen them during their explorations for potential pastoral country in the Gawler Ranges. The latter made several observations of birds, including pink cockatoos, shell parrots [Budgerigars], cockatoo parrots [Cockatiel], pheasants [Malleefowl], a turkey [Bustard] and pigeons [which, in the absence of any qualification, are also presumed to have been Common Bronzewings (see further evidence for this inference below)].

To the south of the Gawler Ranges Stuart shot and ate a "pigeon" while exploring between Port Augusta and Streaky Bay in August 1858; he listed (unqualified) pigeons in his northern expeditions, as well as the Spinifex Pigeon in central Australia in April 1860 and Flock Pigeons north of the Stevenson in February 1861 (Stuart 1865). Neither Stuart (*loc. cit.*), nor Waterhouse (1863) described Crested Pigeons from the successful crossing of the continent in 1861-1862.

Between 1864 and 1870 Frank Gibson collected at least 41 bird species in the Flinders Ranges from near Saltia east of Port Augusta to around Blinman and Lyndhurst but did not include the Crested Pigeon (Black 2013, AB personal data). Earlier Goyder (1857-1858) in June 1857 provided a list of birds that he saw at St Mary's Pool, North Flinders Ranges, "teal, ducks, geese, cranes, cockatoos, pigeons, shell parrots, magpies, curlews, crows, hawks, and other birds, flying about". A little later he saw pigeons to the north of the ranges on the MacDonnell Creek. As with Eyre, Bonnin and Stuart he made no reference to any feature such as a crest and would almost certainly have been referring to the widespread and familiar Common Bronzewing. Goyder did see Crested Pigeons during his "survey of the northern country" beyond Termination Hill on the north-western fringes of the Flinders Ranges in 1860 (Goyder 1860) but Babbage (1858) had seen them in that area two years earlier on his slow westerly passage to Stuart Creek and the shores of Lake Eyre South. He first saw them (following heavy winter rain) west of Lake

Torrens at Wonnomulla on 5 October 1858, evidently near present day Woolnomulla Well in the bed of Millers Creek at around 30° 08' S, 136° 12' E. He also found them further north wherever there was fresh water, perhaps in the upper reaches of Stuart Creek.

In an unpublished note-book an unidentified collector who had worked in NSW, Tasmania and SA, and in Queensland from 1858, provided slightly more direct evidence against the presence of Crested Pigeons in the Flinders Ranges (Chisholm 1944). The collector had spent some time in the Flinders Ranges, including near Mount Eyre, west of Hawker and the adjacent plains bordering Lake Torrens and, in relation to the latter, noted that he had found the (Common) Bronzewing there in great numbers but his only brief observation of the Crested Pigeon was said to have been at Wellington, on the Murray [not, it seems, Wellington on the Macquarie].

While I can find no evidence that Europeans recorded Crested Pigeons within the Flinders Ranges until the end of the 19th century, the Adnyamathanha knew the species well enough in pre-European times for it to be part of a quite complex story (John McEntee pers. comm.). It was known as 'murlambara' ('mulapara' to the Dieri of Cooper Creek) and was held to have stolen grinding stones from the Diamond Dove 'kurukuku' while the latter was absent, looking for seeds. On discovering the theft 'kurukuku' wept unceasingly and has appeared red-eyed to this day. Local grinding stones tend to flake and the sound of two flakes rattling together is similar to that of the Crested Pigeon taking flight. This story, also provided by Tunbridge (1988), places the Crested Pigeon in a malevolent role, which is unusual. My inference from this story, which is supported by McEntee, is that the Crested Pigeon was being portrayed as a foreigner, an opportunistic invader that could out-compete the local dove. Perhaps this occurred at times when inland waterholes dried or became hypersaline and forced its dispersal. Tunbridge (*loc. cit.*) provided a second version of

the story involving the Crested Pigeon, again in the role of thief, but she and McEntee believe it to be of more recent telling, since it follows the arrival of the Galah in the Flinders Ranges and employs a Dieri name for the latter, there being no local name for it (John McEntee pers. comm.).

Ernest Giles made specific reference to "Bronze-winged Pigeons" and, on seeing Spinifex Pigeons, *Lophophaps (sic) plumifera*, for the first time on the Finke River, central Australia in August 1872, remarked on its being "considerably smaller than the Sturt-pigeon" but also with a "high top-knot" (Cleland 1937). The "Sturt-pigeon" was not recorded during his travels from central Australia through the Great Victoria and Gibson Deserts although he did record "pigeons" and these are again presumed to have been Common Bronzewing (Cleland *loc. cit.*). Sturt (1849) made no precise reference to where he saw Crested Pigeons during his hazardous last exploration of the interior across the 'Stony Desert' to beyond the Diamantina but he did indicate that they occurred on the inland river systems. He mentioned pigeons without qualification in several places. His only specific reference to "bronze-wing Pigeons" was in the "box tree forest north of the stony desert with the huge well" [Goyder Lagoon] and it was presumably this species whose brief pause to drink identified a small water source that saved the small retreating party.

Andrews presented to SAMA a single Crested Pigeon specimen in 1875, taken while he was with the Lewis Lake Eyre Expedition, apparently in the later stage when exploring the Cooper Creek channels and floodplains but possibly earlier in relation to the Macumba or Warburton. This specimen is not in the collection today (AB personal data from SAMA records). A specimen in SAMA was collected at Ross's Waterhole north-west of Oodnadatta in 1894 (Horn Expedition, B8854) and egg clutches were received from Kalamurina on the Warburton (Diamantina system) in 1895 and 1897 (J. Reid, B3727, B3728). The first substantive records

from near the Flinders Ranges are of three clutches taken at "Little Lake" west of Farina and Lyndhurst in 1898 (B29777, B29778, B29779). The locality is east of Termination Hill, Willouran Range and therefore near where the species was first encountered by Babbage (1858) and Goyder (1860) although the former's sightings were to the west of the Willouran Range and the latter's very likely were also. Further south a sightseer enthused at seeing "large numbers of the beautiful native crested pigeon" at the Wintabatinyana Homestead waterhole on the Brachina and Bunyeroo floodout, 14 miles west of Edeowie siding in March 1898 (Anon 1898).

The early 20th century

The Crested Pigeon was an unfamiliar bird to the men who formed the SAOA in 1899. Its inaugural President, Dr Morgan, (1897) did not list it among birds recorded while living at Laura in the 1890s but in August 1912 he saw them at Kallioota a little east of the southern point of Lake Torrens. There he found them to be common and, perhaps because they were new to him, he made detailed observations of their forming into pairs before nesting (Morgan 1914, clutches from A. Morgan, B16344, J.M. Merryfield, B556). White (1916a) reported that on Moolooloo Station, east of Parachilna, northern Flinders Ranges in October 1915, Crested Pigeons were not plentiful but they were seen in numbers on the plains near water. He (White 1916b) also told SAOA members of seeing the species during his trip with the Museum Party to the north-east (Strzelecki and Cooper Creeks) in 1916 (specimens from Mount Hopeless, B2198, B2199, Murteree, B2164, Tinga Tingana, B2200, Carraweena, B2163) but said that they were "not nearly so numerous as further north". He referred there to his excursions in 1913 and 1914 to the ranges of central Australia and north-western SA. He had taken at least five specimens during the latter. Two were collected near Oodnadatta on 21 June 1914 (SAMA B51919 and AMNH 615972). The latter, with AMNH 615969-615971, collected at Wantapella Swamp on 20 August 1914, are part of the Mathews collection.

White had also seen them and taken three specimens for Mathews near Tent Hill about 20 km north-west of Port Augusta on 5 October 1911 (White 1912b, AMNH 616006-616008). He was assured that they had appeared there only in recent years, but he did not record them there in the following year during his journey into the Gawler Ranges (White 1913a, 1913b).

Other records of sightings and of egg and skin specimens taken between 1915 and 1920 are mostly from along the upper South Australian reaches of the River Murray (e.g. Waikerie, B51921, B51922, Loxton, Parsons, B18937, B18938), from the northern Flinders Ranges/ North East (Moolawatana, where they were said to be very numerous, McGilp, B14287, McGilp 1919, 1923) and inland rivers of the far North-east (Parsons 1921, Reese 1925). Two from further south are clutches from near Florieton on the open flood plain of Burra Creek north-west of Morgan in September 1915 (H.B. Henderson, B2140) and from near Hawker in September 1918 (Parsons, B18939). In 1917 there were reports of Crested Pigeons in mallee within 20 km of the River Murray near SA's eastern border (Morgan 1917, Parsons 1917, B22837). T.P. Sandland, an informant of Gregory Mathews (1910-1911) from Burra, regarded them as "plentiful in the flats fronting the Murray but rare in the back country".

The 1920s

Crested Pigeons were reported from further south and west during this period. Cleland (1923) saw small numbers south of Port Augusta in August 1922 but not beyond Wilmington or Port Germein. The species was listed among birds identified at the RAOU campout near Mount Remarkable in the southern Flinders Ranges in October 1922 (Cleland 1928). Neither Chenery (1902) nor White (1913b) listed the species from the Gawler Ranges, despite the latter's comprehensive collection and list of 75 species made during two months in the field, but Sutton (1924) and colleagues recorded them in August 1923 from Nonning, Coralbignie and Mount Ive,

as well as from Roopena and Wertigo on north-eastern Eyre Peninsula. Morgan took a clutch at Myall Creek, east of the Gawler Ranges in September 1925 (B17405) and in November 1925 they were seen on Wilgena Station near Tarcoola to the north of the Gawler Ranges (Cleland 1926). More southerly (Mallee) records were from Mantung, east of the Murray (Cleland 1925a) and Kinchina near Murray Bridge in December 1926 (Sutton 1927).

Eckert (2000) provided second-hand and retrospective evidence of a first report in the Strathalbyn District in late 1918 and several further observations during the next five years, after which he believed that it "established fairly widely over the district in quite a short time". Then in February 1927 Ashby (1927) saw Crested Pigeons both south of Murray Bridge and east of Wellington, having not seen them in those places in October and November the previous year. A single bird was seen at Maitland on central Yorke Peninsula in August 1927 (Souter 1928) and one appeared at Encounter Bay after a storm in August 1928 (Cleland 1929b), the same month when Crested Pigeons were seen between Laura and Clare (Cleland 1929c). Cleland (1929a) observed the species between Port Augusta and Lake Torrens in November 1928 but not south-west to Whyalla or north to Hawker and Wilpena. A year later he saw two between Watervale and Melrose but failed to record them from west or north-west of Port Augusta, as far as Tarcoola and Andamooka (Cleland 1930). At the end of the decade Darke (1929) reported that the Crested Pigeon was fairly numerous on the stations south of Mannahill and Boehm (1928) implied that they had been present on the Mount Mary Plains since 1920. Sutton (1930) recorded them near Salt Creek on the Coorong in October 1929.

Expansion through the 1920s and beyond

This period is examined on a regional basis (SAOA 2008), the best documented being Yorke Peninsula. See Table 1.

Table 1. Increasing range of the Crested Pigeon in South Australia by region (SAOA 2008).

Region	Early presumption or records of presence	When established (estimate or according to reports)
North East	At settlement presumed only in riverine habitats; perhaps more widespread by 1890s.	Perhaps established and increasing by 1919 (Moolawatana).
North West	At settlement presumed in riverine habitats (first specimen 1894); between Lake Eyre and Lake Torrens 1858, 1860; south of Lake Torrens 1911, 1912; Gawler Ranges 1923.	In the north by 1913 (White); throughout much of the region after 1930; certainly by 1947 (McGilp) but still rare in Nullarbor, Yellabinna and Great Victoria Desert.
Flinders Ranges	Western fringes of the northern Flinders 1898; within the northern ranges 1915; near Hawker 1918; Mount Remarkable 1922.	Likely 1930-1940; 1937 (Orroroo).
Lower North East	Florieton 1915; Manna Hill 1929.	1932-1937 (Florieton).
Mid North	South of Port Augusta 1922; south of Laura 1928.	Before 1946 (cf Eyre Peninsula).
River Murray	West of Darling junction 1830; possible record before 1858 at Wellington.	Upper Murray of SA before settlement; likely occupation of whole course by late 1920s.
Murray Mallee	Adjacent to upper Murray 1917; Mount Mary Plains 1920; near lower Murray 1918-1925; Pinnaroo before 1934.	1927 (Mount Mary Plains); 1943 (Pinnaroo).
Yorke Peninsula	1927.	1934-1940.
Adelaide Plains	1923-1926, 1934.	1944 (Buckland Park), 1951 (Adelaide) but increasing to peak from 1982-1996.
Mount Lofty Ranges	1928, 1935, 1942.	Before the 1970s.
Eyre Peninsula	North-east 1923, south 1946.	North 1946; south 1971 and extending; Streaky Bay 1972.
South East	Coorong 1929; upper SE 1944; Frances 1954; Bool Lagoon 1972.	Increasing southward through 1960s and 1980s and throughout SE since 2000.
Kangaroo Island	Introduced 1937, 1940.	Not established; last report 1966.

Yorke Peninsula

Souter saw a single bird at Maitland in August 1927 (as above) and again in December 1928 but not thereafter until 1931 and 1932, when numbers seen at any one time increased from two to

fifteen. Nesting was recorded in February 1933 and in each subsequent year (and observations were recorded in every month), as the species increased to become plentiful by 1940 with flocks of between 20 and 50 (Souter 1940).

Further south, on the 'foot' of the peninsula Bonnin (1930) saw his first in January 1929 and by December 1932 he was finding small flocks (Bonnin 1933). By December 1934 they were "more common than bronzewing pigeons" and were regarded as "very common" (Bonnin 1935).

Mid North (plus the northern agricultural region – southern Flinders Ranges) and Lower North-east

Near Florieton, in pastoral country north of the Murray (southern Olary Plains), Pearse (1929) observed increasing numbers of Crested Pigeons over more than a decade, reporting that in 1929 they were present in some numbers with groups of up to 12, having been unknown a few years before [but note the clutch from this place in 1915]. He reported an increase thereafter with large numbers in 1932 (Pearse 1933) and a flock of over 60 in April 1937 (Pearse 1937).

In the northern agricultural region the species was present around Orroroo from 1931 (Gray 1931) but there had been a considerable increase by 1937 (Gray 1938). The first report from Clare was of a pair in July 1933 (Shekleton 1933). They were considered relatively abundant in the "lower and upper north" by 1946 (Storr 1947a) and have been common throughout the mid north since the 1970s (Lynn Pedler, pers. comm.).

Reporting on the Lower North-east (between the River Murray and Lake Frome) Mack (1970) found the Crested Pigeon to be common, except in mallee scrub, with flocks of up to 40. The Common Bronzewing was considered uncommon over most of the region but more common in mallee, particularly in the south where up to 200 were observed at a dam on Calperum Station (Mack *loc. cit.*).

Murray Mallee

Away from mallee close to the River Murray, where the Crested Pigeon had been recorded as early as 1917, McGilp and Parsons (1937) found them to be fairly numerous and breeding near Pinnaroo in September 1936. They had first

appeared in the district "a few years before". In a later report McGilp (1937) suggested 1934 was the year when they had first been seen in the adjacent Victorian Mallee. He stated that numbers had increased greatly by March 1943 when nests could be found in roadside vegetation (McGilp 1943). In the Sutherlands – Mount Mary district, near the eastern margins of agriculture between Eudunda and Morgan, Boehm (1928) surprisingly made no observation on any change in the species' status between 1920 and 1928 although his comment on seeing flocks of 40-50 in 1927 might suggest an increase. Later Boehm (1937) detected no decrease [*sic*] in their numbers.

Adelaide Plains

Crested Pigeons were unlisted among birds recorded in the Reedbeds (Fulham, now a western suburb) by S.A. White (1919) or by his father Samuel White to that time, nor in Adelaide's parklands to 1915 (Anon 1915). In November 1923 Mellor (1923) was delighted to find a pair near his home at Lockleys, a little east of Fulham, and even more pleased when they produced two young in January 1924 (Mellor 1925). They nested again in April 1925 and a pair was present in April 1926 but by August only one could be found (Mellor 1926a, 1926b). Thereafter they were unreported until two were captured at Mitcham, a southern foothills suburb, in March 1934 and identified by Sutton (1934). Sutton's notebooks (in SAMA files) record that in December 1934 H. Wade saw one in Urrbrae near Fullarton Road and that three or four pairs were seen by an employee in the agricultural paddock "at the back" [presumably near Waite's Urrbrae Homestead]. Sutton's notes ceased at the end of July 1938 and included ten further observations of between one and three birds, in May 1935, January and November 1937 and all others between January and May 1938. Confirmation that the species had become more common in the streets of Netherby came from Wade (1938) who reported further sightings to June 1938, including ten together. In September 1934 Jarman (1935) saw two in the North Parklands and one near the

Torrens. A few were seen at Seaton, a beach-side suburb, in April 1937 (Beck 1937).

There is a lack of documentation to show what changes occurred in other suburbs through the years immediately preceding and following World War II but it seems likely that they became widely established during that time. Condon (1951) reported in January 1951 that they had been on the lawns of North Terrace almost daily since May 1950, behaving aggressively towards other (unnamed) birds. At Buckland Park on the Gawler River, Adelaide Plains, to the north of the suburbs they were assessed as fairly common in the years from 1932 to 1935 (Condon and Rix 1936) and abundant in 1944 (Anon 1944).

The prevalence of Crested Pigeons in Adelaide's parklands increased between the 1950s and 1970s (Paton 1976). A continuing census since 1976 (Whatmough, van Weenen and Tan 2013) shows that counts rose to a maximum between around 1982 and 1996 with a slight decline since that period (high counts of about 250 in 1976, 450 in 1983 and 1994, 300 in 2005, 220 in 2009 and 200 in 2011).

Mount Lofty Ranges

A solitary bird was seen at Encounter Bay (Victor Harbor) in August 1928 after a storm (Cleland 1929b) but despite Cleland's regular observations and reports from there, his next record was not until August 1947 (Cleland 1948). A little to the east, between Middleton and Goolwa, Parsons (1933) began to see two or three in "some years" to 1932, having regarded the pigeon as a northern species "until lately". Despite those reports Cleland (1945) still considered an observation of two near Goolwa in January 1945 to be noteworthy. On the Fleurieu Peninsula to the west of Encounter Bay Symon (1940) provided the earliest two reports. In December 1935 a solitary bird had been shot near Delamere where, in November 1937 he was directed to a group of six "topknot pigeons" that he found to be "idle, tame and seemingly lost"; they disappeared that afternoon. He then learnt of a small group (or

groups) of three to five birds that had been seen in several places around Yankalilla, Normanville and Rapid Bay from November 1936. In Belair National Park they were absent in 1936 but present in 1942 (Anon 1943). Between December 1943 and April 1944 there were reports from Mount Barker and Morphett Vale (Cleland 1944, Anon 1944). Undoubtedly Crested Pigeons became well established within the next decade or two. They were recorded as "widespread in all [sub]regions" in the two Bird Atlases of the Adelaide Region in 1974-1975 and 1984-1985 (Paton, Carpenter and Sinclair 1994) but without obvious change in status in the intervening decade.

Eyre Peninsula

White (1912a) spent two months on southern Eyre Peninsula, from Warunda (site of the 1909 RAOU campout) west to Lake Greenly and north to Arno Bay without recording the Crested Pigeon. Nor was it listed by Cleland who spent several days in and near Port Lincoln in May 1923 (Cleland 1925b). Sutton (1924) acknowledged their presence in the myall belt of north-eastern Eyre Peninsula in that year, as above. In October 1946 Storr (1947a) found them to be rare south of Cummins (two records of perhaps single birds over a month) compared with their abundance in the agricultural districts of the lower and upper north. In the following year he reported that they were plentiful further north beyond Yeelanna and were also present at Cowell, their numbers decreasing further south (Storr 1947b). Colin Gill (pers. comm.) confirmed that they were plentiful in the wheat country around Yeelanna in the 1950s but uncommon further south until after the extensive clearances associated with the 'soldier settlement' program took place around Wanilla through the 1960s. In 1971 Eckert (1972) found the Crested Pigeon to be quite common around Cowell, Cleve and Arno Bay and further south near Tumby Bay, Warunda and Coffin Bay. However Gill (pers. comm.) felt that they had achieved their present plentiful status in the Port Lincoln area only in the 1980s and towards the southern coast around Sleaford

a decade later. Eckert (1974) likewise found that they had become common around Streaky Bay by 1972.

The South-east

East of the Lower Lakes Crested Pigeons were recorded south-east of Meningie and at Salt Creek on the Coorong in October 1929, with nesting reported at the latter in October 1932 (Sutton 1933). In the upper South-east Harvey (1933) did not report it at Coombe but 20 were observed at Coonalpyn in April 1944 (Francis 1946). Hood (1934) did not list it for Bool Lagoon although Parsons (1933) believed that it was present by that year (somewhere) in the South-east.

Attiwill (1972) saw his first Crested Pigeon near Naracoorte in 1960 and his notebooks, held by Jack and Pat Bourne (pers. comm.) refer to observations at Frances by E.H. Learmonth in 1954 and a breeding record from Padthaway by H.F. McLay in April 1967. Attiwill (*loc. cit.*) appears to have made several subsequent breeding observations in the district and reported that it was “gradually increasing and coming south”. It was present near Bool Lagoon in 1972 and has increased steadily to the present, flocks of 50 being seen at grain silos in the district (Lynn Pedler pers. comm., Pat and Jack Bourne pers. comm.).

Further south the Crested Pigeon was very uncommon around and beyond Mount Gambier until after 2000 but it has increased steadily since then and is now very common, particularly along the coast (Bob Green pers. comm.). Some evidence of these changes is seen in historical maps published in the two Australian Bird Atlases (Blakers, Davies and Reilly 1983, Barrett *et al.* 2003).

Other regions and general observations

In May 1947 McGilp undertook an inspection of the Dog Fence separating sheep and cattle country from beyond Tarcoola in the west, north and east between Lake Eyre and Lake Torrens, around the

Northern Flinders and south of Lake Frome, east to the NSW Border. He reported Crested Pigeons as plentiful throughout (McGilp 1949).

Terrill and Rix (1950) suggested that the Crested Pigeon could be found “throughout the State with the exception of Kangaroo Island and the lower South-east.” Boehm (1955) commented that they had spread throughout the State and that their numbers then probably exceeded those of the Common Bronzewing. Condon (1962) described “an interior form which has penetrated southern settled districts (except for the lower South-east).” It had been introduced to Kangaroo Island in 1937 and 1940 but failed to become established and the most recent sighting there was in 1966 (Baxter and Berris 1995).

A measure of its abundance in 1961 is suggested by there being no limit on the number that might be taken from the wild in that year, although there was an annual quota of 100 for all other pigeons and doves combined (Condon 1961).

The Crested Pigeon is now common throughout much of mainland SA (SAOA 2008), including (relatively recently) southern Eyre Peninsula and the whole of the South-east. Only on the Nullarbor Plain and in the Yellabinna and Great Victoria Desert are there few records and very small numbers (Bransbury 1984, Black and Badman 1986, Burbidge, Casperson and Fuller 1987, Black and Longmore 2004, unpublished SAOA/DEWNR data). Its total distribution has changed only slightly since the 1970s but its abundance may have increased until and beyond the end of vegetation clearance soon after 1985.

DISCUSSION

Inferences drawn from available evidence must be tempered with the knowledge that it is incomplete and that the identified period of range expansion has been accompanied by a parallel increase in observer activity. An early broad failure of explorers other than Sturt (and later Babbage and Goyder) to record the species does

not translate to proof of its absence; nor does the frequent reference to pigeons without describing a crest necessarily prove that none of them was crested. On the other hand it is very clear from contemporaneous writing that any mention of a pigeon without qualification would most likely apply to the familiar pigeon of the period, the Common Bronzewing. It is also noteworthy that the Crested Pigeon was greatly admired by those lucky or intrepid enough to encounter it during early European Australian history and it seems probable that first observations would have been likely to prompt some specific comment, as it did when the species began to be observed in new places in the twentieth century. With those caveats it appears that until the 1890s the Crested Pigeon was known only from its strongholds in the open riverine habitats of the Murray-Darling and Lake Eyre Basins, the latter including the Diamantina and Cooper drainages as well as those associated with rivers arising in the north-western South Australian and central Australian ranges. Whether the southern Lake Eyre and western Lake Torrens drainages were part of its core territory or only occasionally occupied is less certain.

Evidence for its early presence in the Flinders Ranges is supported only in stories of the Adnyamathanha, in which it appears to have been portrayed as an irregular visitor. Otherwise the earliest records are from its northern periphery in the 1890s and expansion into the northern and central Flinders Ranges and the near north-western and lower north-eastern pastoral regions occurred through the first two decades of the 20th century. Reports were inconsistent through the 1920s, suggesting that the species was still relatively uncommon or intermittent in its occurrence during that period and probably continued to increase into the 1940s (McGilp 1949).

There is persuasive evidence that the Crested Pigeon was absent from the Gawler Ranges and north-eastern Eyre Peninsula until around 1920. Records from the Mallee near to the Murray

were restricted to around the eastern border region until around 1925 but spread to the lower Murray and Coorong was evident by the end of the decade.

Establishment on Yorke Peninsula was rapid, from an initial report in 1927 to its becoming a common species over the whole peninsula by 1934 and even more abundant by 1940.

On the southern Olary Plains (Florierton) there is evidence to suggest that, after an isolated occurrence with breeding in 1915, the species was absent (or very rare) until the 1920s with steadily increasing abundance through 1937. Numbers increased in the agricultural north (Orroroo) between 1931 and 1937 and in the heart of the Mallee (Pinnaroo) from 1934 to 1943.

In the Adelaide area there was a vagrant occurrence between 1923 and 1926 with breeding, followed by a second wave with progressive colonisation between 1932 and 1950 and even greater abundance in the 1970s and 1980s. Establishment of sizeable populations through the mid north and northern agricultural regions occurred within two decades of its arrival in Clare in 1933. Initial records in the southern Mount Lofty Ranges, Fleurieu Peninsula, central Eyre Peninsula and upper South-east ranged through the 1930s and 1940s.

In southern Eyre Peninsula it appears to have been a vagrant in the 1940s and to have become established only in the 1970s. It has occupied the lower South-east progressively since the 1960s and the most southerly parts only since the beginning of the present century. Consolidation of populations in most areas has followed over one or several decades. In many respects the range expansion of this species has run parallel to that of another former arid zone granivore, the Galah, whose status in SA is under review (AB and P. Horton in prep.).

In summary I find early evidence of expansion of the Crested Pigeon's South Australian range

in the 1890s with subsequent spread into all established pastoral areas up to the 1920s and to the agricultural (cropping) districts in the 1930s. The higher rainfall regions including forested parts of the State have generally become occupied between the 1940s and 1970s but with increasing prevalence through to the present in southern Eyre Peninsula and the lower South-east. Initial sporadic reports have included two instances where documented breeding was followed by apparent absence and a subsequent reappearance with colonisation.

The Crested Pigeon has been spectacularly successful in adapting to anthropogenic environmental change since Gould's time when he "regretted that, owing to its being exclusively an inhabitant of the plains of the interior, it can never become an object of general observation". On the contrary it can now be found readily amongst the haunts of civilised society without any requirement of particular enterprise by its citizens. Some consideration is given to an explanation for this success.

A flourishing population of a granivorous bird requires an abundance of seed and the reliable availability of free water. The widespread establishment of open water sources for stock from the 1850s through to the 1920s is a ready explanation for the expansion from its area of occupation of inland riverine habitats into occupied parts of the pastoral arid zone. By 1940 Crested Pigeons had populated many agricultural areas as native vegetation was cleared and replaced by cereal crops with nearby water sources in the form of farm dams and stock troughs. Occupation did not follow clearance and cropping immediately but came over a period of one to several decades, often with an early or even transient appearance in small numbers, and later population consolidation. Given that the Crested Pigeon's range was initially identified within the arid interior of the continent where water sources were variable and/or impermanent its capacity for nomadism would have been well developed, accounting for its occasional

appearance on the Liverpool Plains and perhaps in the periphery of the Flinders Ranges.

Several experienced observers speculated that the spread of Crested Pigeons into better watered regions was in response to drought. McGilp (1937) attributed it to "drying up of the interior" from "the ever recurring droughts and the regular stocking of the country with sheep and cattle". It is perhaps pertinent here to observe that White's observations north-west of Port Augusta in 1911 (at a dam) were in extreme drought conditions (White 1912b) but he did not see them there a year later, following drought-breaking rains (White 1913b). Boehm (1955) and Eckert (2000) related southerly reports in agricultural areas in the early 1920s to the World War One drought, Boehm referring to the years 1918-1919 and Eckert to 1914. These comments appear to overlook the reality that drought in the interior has indeed been ever recurring; in particular, the drought of 1864 to 1867, which led to the drawing of Goyder's Line, resulted in far more land degradation than any subsequent drought although worse followed the calamitous agricultural expansion of the next decade. At best this can only be a part explanation and it is not so much drought as the Crested Pigeon's strategy of dealing with drought that may be pertinent. It also fails to account for the parallel increase that has been evident through the Crested Pigeon's drought-prone core range. It is likely that the Crested Pigeon expanded into new territory only after a period of population growth. Veit (2000) drew attention to the relationship between increased vagrancy and population growth, the former providing evidence of and being driven by the latter. When conditions for the Crested Pigeon were enhanced by more reliable water availability in the early years of pastoral development its population burgeoned and, given its propensity to nomadism, the generation of vagrants was followed by colonisation wherever conditions suited it.

The familiar pigeon of early settlement, the Common Bronzewing, might also have

benefitted from the combination of cereal crops and artificial water resources but it is a species of woodlands and shrublands and declined as they were cleared so that eventually the open country adapted Crested Pigeon was found to have overtaken it. Such a reversal in numbers now applies to all occupied parts of the State except Kangaroo Island.

In a study of the diets of Crested Pigeons and Common Bronzewing near Griffith New South Wales, Frith, Brown and Barker (1974) made a number of observations when comparing the two most widely distributed pigeons in Australia. The Crested Pigeon, which favours more open and better watered woodlands and is never found far from water, had expanded into country cleared for cereal production, whereas the bronzewing, which can be found in true deserts and will fly long distances at dusk to drink, appeared to have maintained its status in the arid zone but to have declined in closely settled districts.

The Crested Pigeon showed great flexibility in its food requirements, consuming seeds and some leaves of many pastoral plants and weeds, notably Paterson's Curse/Salvation Jane, *Echium plantagineum*, and with native plants of little importance in its diet. They concluded that removal of much of the tree cover and change in the ground cover to a community of annual and usually exotic weeds plus provision of surface water favoured that species.

The Common Bronzewing was found to consume much wheat grain as well as weeds of cultivation but relied on the seeds of native plants in autumn and winter or during drought. The relevant plants, chiefly leguminous trees and shrubs, are destroyed by cultivation and their regeneration is prevented by grazing so that continued growth of 'primary industry' was operating against the Common Bronzewing while favouring the Crested Pigeon.

There might be other adaptive traits that would allow the Crested Pigeon to respond

favourably to changes brought about by European development and increased human occupation. It is characteristically an accepting and confiding bird, not so shy or wary as the Common Bronzewing (Higgins and Davies 1996 and references therein). Another potentially significant trait to which Condon (1951) alluded is aggression towards other birds. Higgins and Davies (*loc. cit.*) stated that it is one of the most aggressive of the bronze-winged pigeons when feeding and will kill others in the aviary. Those traits might bear closer study in wild populations but a combination of acceptance of human presence and assertion of its feeding space might contribute to the explanation of how the Crested Pigeon has adapted and expanded so readily into man-modified environments.

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While the Crested Pigeon is widely known to have expanded its range in south-eastern Australia during the 1920s and 1930s, in South Australia's pastoral areas the process began as early as the 1890s, extending into the northern and central Flinders Ranges during the first two decades of the 20th century. Occupation of the Gawler Ranges and other pastoral regions continued through the 1920s with a southerly expansion into the Murray Mallee taking place over that and the succeeding decade. In recent decades, the Crested Pigeon *Ocyphaps lophotes* has progressively increased its range (McAllan 2003;Black 2015), and it is now common in the Sydney region of New South Wales.