

Birds of The Greater Reedbeds, Adelaide Plains

PENNY PATON

Abstract

The Greater Reedbeds to the west of Adelaide in 1836 supported a patchwork of wetlands, woodlands and sandhills, and the complexity of the vegetation was reflected in a rich avifauna. Of the 230 bird species recorded from the Greater Reedbeds since European settlement, most were recorded up to the 1930s and many bred in the area. With the growth of Adelaide and the development of the area for agriculture and later for residential and commercial purposes, most of the wetlands and native vegetation was destroyed or highly modified. The introduction of weeds and pest animals further decimated the native plants and animals of the Reedbeds. Many bird species became extinct, many others have become rare and a few have colonised the area. From the 1970s on changing attitudes to nature conservation led to more extensive plantings of native plants in parks and gardens and, in the early 2000s, concern over sustainable water use led to the development of Aquifer Storage and Recovery systems at golf courses. The wetlands associated with these systems and the more sympathetic treatment of the rivers and creeks in the area have benefitted some waterbird species. Despite declines in native bird abundance and richness, the Greater Reedbeds remains the richest area for birds in the inner metropolitan Adelaide area, due mainly to the open space of airport land, the golf courses, the River Torrens and Patawalonga Creek and their associated wetlands, and the West Beach Trust land. Management actions to further enhance terrestrial and wetland open space for birds are provided to guide land managers in their decision making. Regular bird surveys at Adelaide Airport, two golf courses and the lower reaches of the River Torrens conducted from 1988 to the present (to 2016 at the Airport) were the impetus for this paper and they demonstrate the importance of detailed and long-term data sets. They will provide a baseline to measure future changes to avifauna in the area, particularly as we experience a hotter and drier climate due to anthropogenic climate change.

INTRODUCTION

All but obliterated under an urban landscape was a natural paradise known as the Greater Reedbeds (*sensu* Kraehenbuehl 1996) – a substantial patchwork of woodland, sandhills, reedbeds dominated by rushes and reeds (after which the area was originally named) and other wetlands to the west of Adelaide that stretched from Glenelg in the south to Seaton and Grange in the north (Figure 1). The waters of the River Torrens and other streams entered the Greater Reedbeds on its eastern border, with the overflow draining to the sea via the Patawalonga Creek and through the Old Port Reach of the Port River (Holmes and Iversen 1976). While the River Torrens, enhanced by water from its five creeks, delivered the largest amount of water to the Reedbeds, three other

streams in descending order of size, Sturt River, Brownhill Creek and Glen Osmond Creek, also flowed into these low-lying swamps (Holmes and Iversen 1976). Sand dunes along the coast confined the water until summer and autumn heat evaporated much of it (Holmes and Iversen 1976). Research by Kraehenbuehl (1996) determined that the waters of Brownhill Creek did not enter the Sturt River, but rather flooded out in a broken line onto the plains west of Plympton.

One of the best descriptions of the area comes from Samuel White whose father, John White, arrived in the fledgling colony of South Australia in 1836 and settled at Fulham, known at that time as the Reedbeds. Figure 2 shows the extent of John White's property superimposed on a more modern map. Samuel's son, (Captain)

S. A. White, recounted his father’s memory of the original environment (White 1914):

At that time much of the property was covered in a dense mass of reeds and flags, outside of which was a fringe of high dense rushes and luxuriant grasses. This, combined with belts along the river of fine timber, red gum (*Eucalyptus rostrata*) [now

E. camaldulensis] and sandhills not far off, covered with pines and banksia, and out beyond that open plains and marsh land, made a rich and diversified collecting ground, which has today practically passed away owing to the advance of civilization.

Cecil Rix (1983) painted a picture of the view from his front veranda as a child growing up on

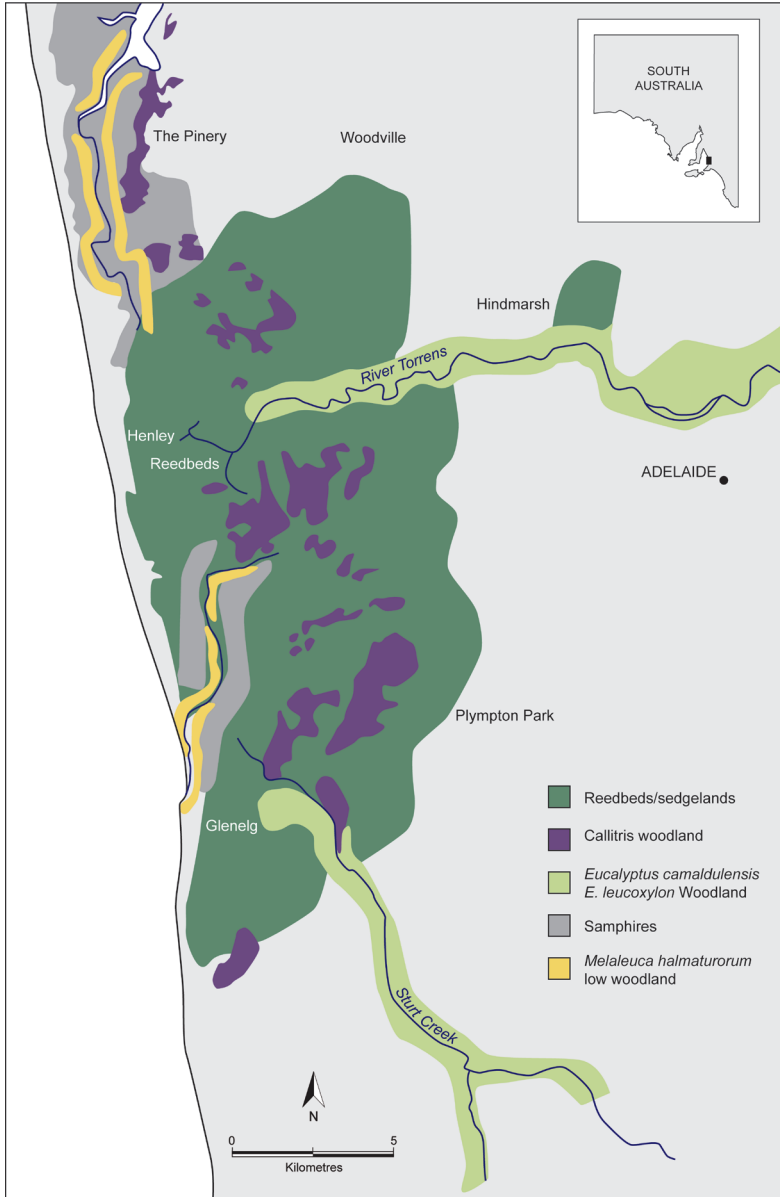


Figure 1. The extent of the Greater Reedbeds area and complementary terrestrial vegetation along watercourses and on red sandhills in 1836 (after Kraehenbuehl 1996).

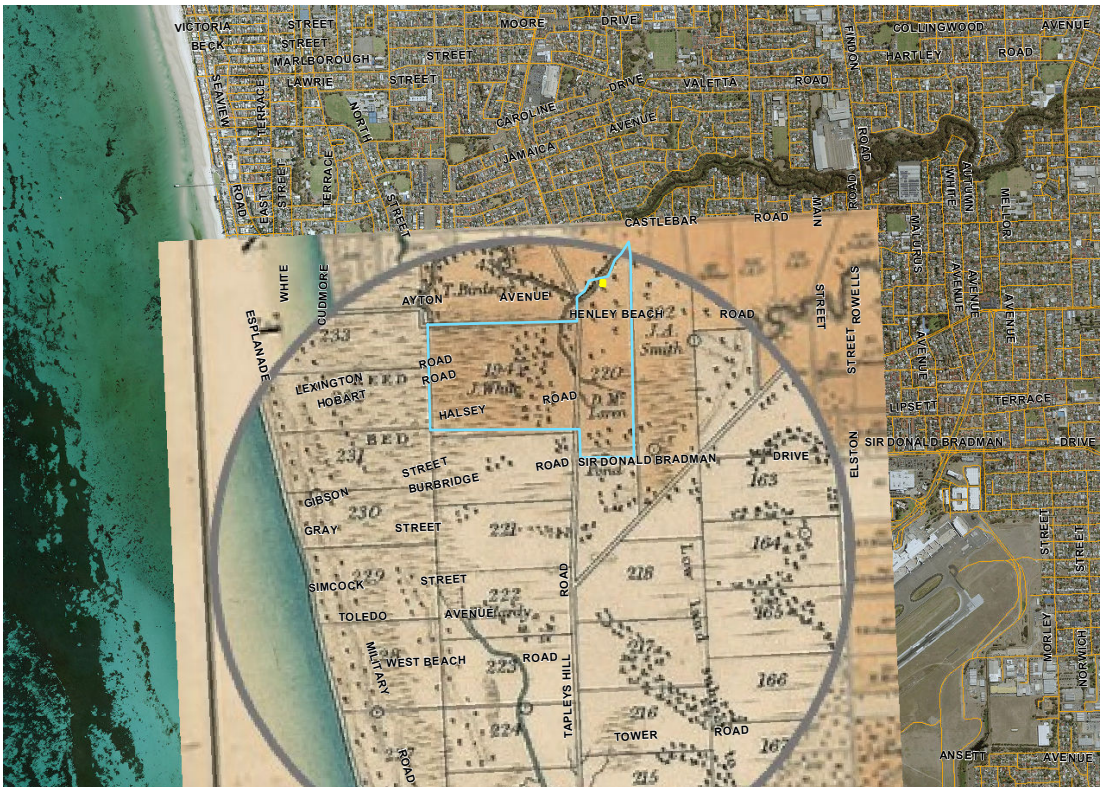


Figure 2. Western portion of 1839 map of Adelaide, superimposed on a modern map. The area outlined in blue shows the extent of John White's 'Fulham Farm' property, and the yellow square in its NE corner marks the site of 'Weetunga', the home built by Samuel White in the late 1870s.

East Terrace at Henley Beach in the period after 1910:

The view to the east was of vast expanses of grassy paddocks studded with River Red gums, a few Weeping Willows, various patches of reeds and rushes and some grazing cattle... They were old trees and certainly predated the proclamation of South Australia.

Neither S. A. White nor J. W. Mellor, ornithological cousins who lived all their lives in the Fulham and Lockleys area and wrote papers and notes on the birds they recorded and collected there, outlined the boundaries of what they called the Reedbeds. However, most of what we know of the birdlife of the Greater Reedbeds from the nineteenth century and the first thirty years of the twentieth century

comes from the observations of these two men and from White's paper on his father and grandfather's recollections (White 1919a). We can assume that many of their records came from near their homes. Kraehenbuehl (1996) mapped the extent of the swampy country which he called the Reedbeds in his figure depicting the 1836 vegetation of the Adelaide Plains. This shows a roughly rectangular area from Somerton Park, Glenelg South and Glengowrie extending northwards along the coast to Grange, Seaton and Woodville South and with its easterly extent demarcated by the current suburbs of Plympton, Marleston, Cowandilla, Underdale and Beverley.

Known as Wittongga tarto (low swampy reed country), the northern part of the Reedbeds was an important area for the Kaurna people due to the rich resources of plant and animal life,

particularly during the summer (<https://www.charlessturt.sa.gov.au/Witongga>). The more southerly section around the Sturt River was called Warriparinga and the area was described thus by William Everard in the autumn of 1838 (Dolling 1981):

a chain of freshwater lagoons overgrown with flags and bulrushes about eight feet high and abounding in wild ducks. It was a happy hunting ground where Aborigines trapped swans, pelicans, teal, bronze-winged pigeons, quail and parakeets, as well as numerous fish in and around the flooded gums, swampy areas and samphires.

Development of the Greater Reedbeds after European colonisation

The usefulness of this fertile and well-watered area was quickly recognised by the early

European colonists who established farms and gardens, growing crops, vegetables, fruit and vines as well as using pastures for grazing domestic stock. By the 1840s there were a number of farms in the district, including the Grange of 400 acres, (<https://data.environment.sa.gov.au/Content/heritage-surveys/3-Western-Adelaide-Region-Heritage-Survey.pdf>) and John White's Fulham Farm of four sections (Linn 1989). Likewise in the southern part of the Greater Reedbeds, sections were acquired and farmed in the late 1830s and 1840s, including Dr Everard's two farms along what is now Anzac Highway in Plympton (Dolling 1981). By the 1870s Frogmore Farm covered 3000 acres of the Patawalonga Creek area, made possible by 15 miles (24 km) of drains (<http://users.sa.chariot.net.au/~littoral/pat-ck/pb/pb3-2a.htm>). In the 1870s, John Fox Mellor established a farm and substantial home, Holmfirth, on the north-western corner of Tapleys Hill and Henley Beach Roads and photos



Figure 3. Photo taken from a windmill on the River Torrens looking north-west over paddocks at the back of the Mellor home 'Holmfirth', Lockleys. The photo is undated but is likely to be from the late 1800s (From the collection of the State Library of South Australia, PRG 335/109/11).

in the Mellor collection in the State Library of South Australia demonstrate the agricultural nature of the area in the late 1880s (one such photo is shown in Figure 3).

In the southern part of the Greater Reedbeds, Glenelg was the earliest town established; Glenelg was an important port and from the 1840s became a seaside resort, with a daily passenger service to Adelaide by horse-drawn cart beginning in 1845 (<https://data.environment.sa.gov.au/Content/heritage-surveys/2-Glenelg-Heritage-Survey-Stage-1-1983.pdf>). However, in the early years flooding of the track between Glenelg and Adelaide was a constant problem when the Sturt River rose. The opening of the railway to Adelaide in 1873 assured the continued growth of Glenelg as a resort and a residential area (*ibid.*). Periodic flooding from the Sturt River was a continuing problem in the middle years of the nineteenth century, when the railway was swamped and roads became impassable. In 1879 construction was completed of a 3-mile (5 km) drain to take floodwaters of the Sturt north-west into the Patawalonga (Dolling 1981). Despite this, intermittent flooding continued and, after severe flooding in 1963, the river was concreted, through the construction of the Sturt Drain between 1968 and 1972 (<https://birdssa.asn.au/location/warriparinga-wetlands-sturt/>).

Urban development in the low-lying swampy area of the northern Greater Reedbeds was curtailed until the first roads were constructed in the 1870s (http://henleyandgrangehistory.org.au/?page_id=10). From 1877 the townships of Henley and Grange sprang up but development was slow until public transport was secured in 1882, with a horse-drawn tram service operating between Adelaide and Henley, extended to Grange a few months later, and a narrow-gauge railway between Grange and Woodville. Over the next few years these small townships grew into popular seaside holiday spots. Their popularity increased with the extension of the train line to Henley in 1894

and the electrification of the tram in 1909 (*ibid.*). In the southern part of the Greater Reedbeds, townships like Glandore and Plympton Park were subdivided in the early 1880s but remained unoccupied and undeveloped for a number of years (Dolling 1981).

Despite the viaduct which carried the tramway across a flood-prone part of Henley, regular winter floods caused havoc with the tram and rail services. This was not rectified until 1937 when the River Torrens outlet via Breakout Creek was constructed. Rapid housing development followed after World War II, partly fuelled by the greater availability of motor transport. This saw Adelaide's population more than double in thirty years, from 382,000 in 1947 to 900,432 in 1976, and the urban footprint expand threefold in this same period (<https://data.environment.sa.gov.au/Content/heritage-surveys/3-Western-Adelaide-Region-Heritage-Survey.pdf>).

Most of the suburbs of the Greater Reedbeds were established prior to 1976, the exception being the last remnant of the Kidman property. For nearly a hundred years, until 1973, there was a horse stud on the northern side of the River Torrens. In 1868, William Blackler purchased the Fulham Park Estate, which at that time extended from south of Henley Beach Road to Grange Road (<http://www.charlessturt.sa.gov.au/FulhamParkStud>), and in 1874 created the Fulham Park Stud. In 1912 the estate was bought by Sir Sidney Kidman, who used the property for thoroughbred breeding. Part of the Fulham Park Stud south of the Torrens was acquired in 1935-36 by the Engineering and Water Supply Department for the construction of Breakout Creek and, in 1949, 50 acres in the north were sold to the Housing Trust, becoming the suburb of Kidman Park. Through the 1960s 70 acres were retained by the Kidman family but in 1973 all but three acres around the homestead were sold; the last three acres were subdivided in the late 1980s.

While most of the Greater Reedbeds area was subdivided for housing, commercial properties or light industry, a few areas were retained as open space. Construction of Adelaide Airport was completed in 1954 and the main runway was extended to the south-west in 1995-97. This included the rerouting of Tapleys Hill Road and a change to the area and configuration of the Patawalonga Creek and resulted in the Airport occupying 785 hectares. Over the past 20 years,

open airport land to the south-west of Adelaide Airport and north of James Melrose Road has been leased for commercial and industrial purposes, leading to a diminution in the area of this habitat. This process of reclamation of airport land for such purposes is expected to continue.

West and south-west of Adelaide Airport is West Beach Parks, a 135-hectare site, comprising two golf courses, playing fields and holiday

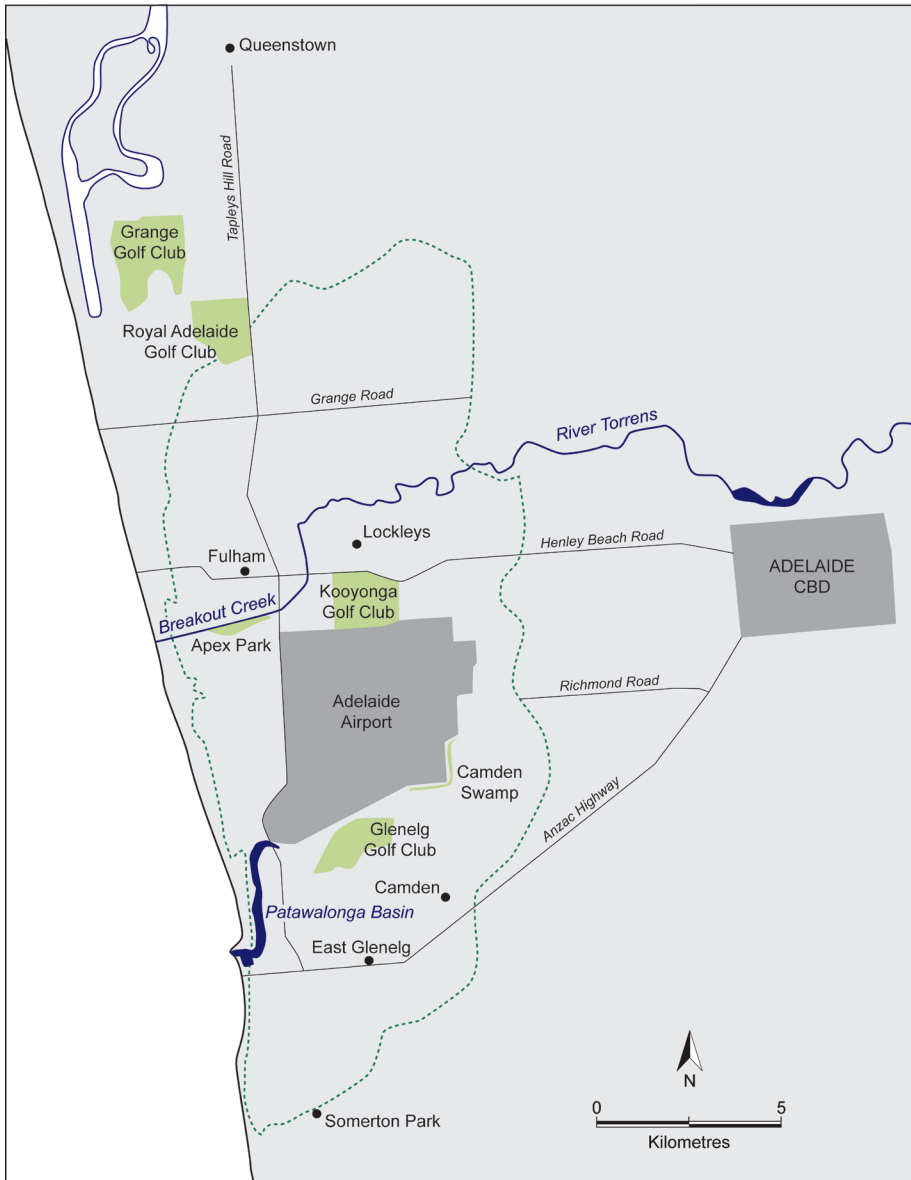


Figure 4. The Greater Reedbeds area in 2020, showing the watercourses, golf courses, Adelaide Airport, major roads and relevant suburbs. The Greater Reedbeds itself is delineated by the dotted line.

accommodation. This land is managed by the West Beach Trust, is bounded by West Beach, Military and Tapleys Hill Roads and to the south by the Patawalonga Creek, and includes a large detention basin north of Africaine Road and several smaller water bodies. On the corner of Tapleys Hill and West Beach Roads is a section of the Patawalonga Creek and environs on airport land that was restored and revegetated in the 1990s. Throughout the Greater Reedbeds are small and medium-sized ovals, public parks and gardens.

A number of golf courses dot the area, namely Glenelg, Kooyonga and Royal Adelaide (see Figure 4) and the two West Beach Parks courses, including the Patawalonga Course, at Westward Ho Golf Club. A Linear Park borders the River Torrens and in the lower reaches there have been two major redevelopments of the wetlands and river banks. In 1999 Breakout Creek Stage 1 was constructed, north of Henley Beach Road, and from 2009 to 2010 Stage 2 was implemented between Henley Beach and Tapleys Hill Roads. Horse grazing was thus restricted to the river banks between Tapleys Hill Road and the sea and the upstream areas were planted with local native plant species. Islands were created and reed and rush growth along the banks of the River Torrens has increased due to these changes.

In terms of wetlands, while most of the original Greater Reedbeds swamps have disappeared, there still exist the waters of the River Torrens, the Patawalonga Creek and a series of drains that surround and cut through the Adelaide Airport, including Brownhill Creek, which meets the Patawalonga on the southern edge of the Airport. New wetlands have recently been constructed at two golf courses as part of a region-wide Aquifer Storage and Recovery scheme. Built in 2009, the wetland at Royal Adelaide Golf Course has an area of about 1 ha and in 2010 the Glenelg Golf Club added 1.4 ha of wetlands and 50,000 plants to the course. The 7 ha Apex Park site at West Beach features

a large wetland, constructed in 1993 to detain and improve stormwater before discharge to the River Torrens. This wetland was reconstructed between early 2018 and late 2019, reducing the extent of the wetland and associated reedbeds. This was part of Breakout Creek Stage 3 and included the relocation of horse yards adjacent to Lockleys Oval to the northern side of Apex Park. While Grange Golf Course is situated in an area known as The Pinery and is north of the Greater Reedbeds (Figures 1, 4), it is worth noting that this Golf Club constructed 3 ha of vegetated pools on its eastern boundary in 2009 and provides habitat for both terrestrial and wetland birds.

Vegetation of the Greater Reedbeds

Kraehenbuehl (1996) provided a summary of the plant associations and plant species of the Greater Reedbeds area noted by early botanists and collectors, including Ferdinand von Mueller and Ralph Tate in the nineteenth century and S. A. White and J. B. Cleland in the early twentieth century. Kraehenbuehl (1996) listed 129 plant taxa from the Reedbeds, but we can be sure that there were many more species. Of these 129 taxa, at least 73 (about 57%) are extinct and many more are rare due to the almost total draining and clearance of the area. A River Red Gum *Eucalyptus camaldulensis* open forest over Lignum *Muehlenbeckia florulenta* with a sedgeland of Common Reed *Phragmites australis* and Narrowleaf Bulrush *Typha domingensis* was widespread along the River Torrens and Sturt River and around the lagoons near the coast. This association probably merged into a *Juncus/Cyperus/Isolepis* (now *Ficinia*) sedgeland around the lagoons and may have included Swamp Wattle *Acacia provincialis*. Interspersed amongst the swampy sedgelands and reedbeds were patches of Southern Cypress Pine *Callitris gracilis* and Drooping Sheoak *Allocasuarina verticillata* woodland on red sandhills (Figure 1). A low open forest of Swamp Paperbark *Melaleuca halmaturorum* with samphire flats occurred in saline and semi-saline areas on the

periphery of the reedbeds, interspersed with grasslands of rushes, reeds and salt-tolerant grasses. In the permanent and temporary waters were an array of water-loving plants such as Water-ribbons *Triglochin procerum*, water milfoils *Myriophyllum* spp. and pondweeds *Potamogeton* spp. (Kraehenbuehl 1996).

Fenner and Cleland (1935) described the geology and botany of the Adelaide coast. This publication included Cleland's notes on the flora of an area stretching from Outer Harbor in the north to Sellicks Beach in the south. He described ten different vegetation types, including the Reedbeds and the consolidated sand dunes, and gave a complete plant list based on his collections. Cleland's definition of the Reedbeds covered the area from the Port River in the north to the Patawalonga Creek in the south and is thus fairly similar to the area described as the Greater Reedbeds by Kraehenbuehl (1996). Cleland also provided maps of the coast showing the different vegetation types. Information from both these sources is combined in this paper.

Cleland (in Fenner and Cleland 1935) described the area as he knew it in the 1920s and 1930s:

The Reedbeds were formed by the waters of the Torrens, obstructed by the coastal sandhills, spreading out laterally over alluvial flats and junctioning by more definite channels with the Port River on the north and the Patawalonga on the south. Thirty or more years ago they were what their name implies, extensive swamps covered with water two to several feet deep... As a result of the destruction of the natural vegetation of our hills, the creeks flowing into the Torrens have been bringing down annually vast quantities of soil in their flood waters.... This silting combined with drainage channels has reclaimed nearly all the swamp and changed the whole face of the area.

By the 1930s little of the original swamp vegetation remained in the Reedbeds, despite

some minor flooding of the flats near the River Torrens (Cleland, in Fenner and Cleland 1935). 'Jerusalem', an area that contained native vegetation, was probably the first artificial wetland on the Adelaide Plains. In 1893 William White, S. A. White's uncle, began constructing a wetland covering two hectares on property owned by his brother, Charles, in what is now Henley Beach South (Grainger 2016). A lake and planted native vegetation provided habitat for birds and other animals but, despite the area being designated a sanctuary, illegal hunting occurred and the area was poorly maintained in its latter years. By 1919 the area was not fulfilling William White's intentions and in the mid-1930s 'Jerusalem' was drained and severely damaged by the construction of the outlet of the River Torrens (Grainger 2016).

Sand dunes once extended from about Queenstown to the north of the Reedbeds, south to the Sturt River near Camden Park, with a disjunct minor group of dunes occurring further south between East Glenelg and Somerton (Kraehenbuehl 1996). They had fared better than the swamps when Cleland described them in the mid-1930s (Fenner and Cleland 1935). The creation of the five western suburbs golf links provided some protection for the vegetation of the sand dunes and at least prevented those areas from being subdivided for housing.

Aims of this paper

This paper presents a summary of bird species recorded from the Greater Reedbeds area since 1836, documents the species that have become extinct in the area, describes species that have apparently colonised or recolonised the area after a period of extinction, as well as presenting data from thirty years of observation of birds of the Adelaide Airport and its environs, spanning 1988 to 2020.

METHODS

For the purpose of this study the Greater

Reedbeds region is the area shown as being dominated by reedbeds by Kraehenbuehl (Figure 1) and delineated by a dotted line in Figure 4. The latter figure shows the current course of the River Torrens and localities discussed in the text.

Early records

We will only ever have an incomplete picture of the birdlife of the Reedbeds, due to the early clearance of vegetation and draining of the wetlands for agriculture and the dearth of any systematic bird surveys from the early days. However, a reasonably comprehensive list was collated from the following sources.

The ornithologists S. A. White and J. W. Mellor recorded their observations and made skin and egg collections in the Reedbeds area in the late nineteenth and early twentieth centuries. White (1919a) documented bird species recorded by himself, his father and grandfather and made notes on trends in abundance, including extinctions. Another, shorter paper documented the more unusual birds seen by White (1925) over the autumn and winter of 1924. White and Mellor also contributed observations on birds seen at the Reedbeds in the 'Bird Notes' section of the *South Australian Ornithologist*. In addition, White and Mellor contributed specimens and notes to G. M. Mathews for his *Birds of Australia* (1910-1927). While White and Mellor were very competent observers, we cannot interrogate their records and White was known to make errors of omission and commission. Therefore, we need to be cautious in interpreting their data and be aware of possible errors, like White's omission of Buff-banded Rail *Hypotaenidia philippensis* from his paper (White 1919a). Rix (1983) reported this species coming to his garden on a regular basis in the early 1900s and there are records from Fulham and Lockleys from 1917 onwards (e.g. Mellor 1917a, 1918; White 1919b).

Most of the early records fall in the period

prior to the early 1930s before J. W. Mellor died in 1931 and after which S.A. White's interest in birds waned. However, there are incidental specimen and sight records in the period between 1932 and the more intensive modern recording period of 1988 to 2020. An arbitrary cut-off date of 1945 was chosen to divide the two periods, which corresponded to a large increase in the size of metropolitan Adelaide post-World War II and increased development in the study area, with the establishment of housing estates and, in 1954, the Adelaide Airport. Accordingly, the time periods considered will be 1836 to 1880 (at the end of which S. A. White and J. W. Mellor were old enough to collect specimens and document their sightings), 1880 to 1945, and 1946 to 2020. However, the results and discussion about bird distribution and abundance more closely reference the period 1988 to 2020 to align with the current author's and others' more in-depth observation period.

Specimen records from the study area (Figure 4) in the South Australian Museum, Adelaide (SAMA) were analysed and these include those collected by S. A. White and J. W. Mellor, and S. A. White's father, Samuel, and his uncle, William (Horton *et al.* 2018). Specimen records were divided into three periods: ≤ 1880 and pre- and post- 1945 to align with sight records.

Within the Reedbeds was an area known in the early 1900s as Camden Swamp. This series of swamps was visited by members of the South Australian Ornithological Association, and bird species seen there were noted in early volumes of the *South Australian Ornithologist*. J. Neil McGilp was one of the few early ornithologists to describe the exact location of Camden Swamp, on the data slip for a clutch of eggs of the Red-kneed Dotterel *Erythrogonys cinctus* (SAMA B14403) that he collected there. He placed it 'About one mile from Morphettville Racecourse in a northerly direction ... adjoining sand hills, and immediately west of Bronzewing Poultry Farm' (P. Horton pers. comm.).

This location is near the current Mooringe Avenue in North Plympton and its approximate position shown in Figure 4. Camden Swamp was drained prior to September 1936 (Sutton 1936), but Sutton noted that there was still swampy ground along Richmond Road (about 1.5 km to the north) that provided habitat for waders. The earliest records of specimens in the SAMA from Camden Swamp were Dr A. M. Morgan's collection of egg clutches of Hoary-headed Grebe *Poliiocephalus poliocephalus* and Red-kneed Dotterel on 2 October 1915.

Recent surveys

During the course of nearly thirty years' employment surveying and counting birds at Adelaide Airport, I surveyed birds at Glenelg Golf Course (GC), Kooyonga GC and along the River Torrens from just north of where it crosses under Henley Beach Road to the sea and including the Apex Park Wetland (Figure 4). The Airport was surveyed over five hours several times each month from 1988 to mid-2016, while the golf courses and River Torrens surveys occupied three to four hours in the early morning every three months, usually in February, May, August and November, from 1995 to 2020.

Bird records from two other golf courses in the area were included. Those from the Royal Adelaide GC (which straddles the boundary between the Greater Reedbeds and The Pinery) were retrieved from lists held by the administration at the Club and based largely on birds observed by golfers including my mother, Muriel Reid, a long-term club member. These lists are largely unannotated so it is impossible with most species to know how frequently or when they were observed. There is also less certainty about the accuracy of bird identification so records of rare species or those which were only recorded from the Royal Adelaide GC must be viewed with a degree of caution. While not included in the list of birds in Table 1 nor in the analysis of bird records from the Greater Reedbeds, reference is made where relevant to

birds observed at Grange GC from 1993 till mid-2009 by Derek Carter and from 1965 to 1970 by T. J. Smith.

David Edey provided me with his extensive database of birds and breeding birds of the Greater Reedbeds area from 1995 to the present. These included birds recorded for the Birds Australia atlasing scheme from 1995 to 2003, the Birds SA atlasing scheme from January 2014 to January 2015, and opportunistic observations at Ayton Road, Fulham from 1995 to 2006 and at Malurus Avenue and Mellor Park, Lockleys from 2007 to the present. From 2019 onwards eBird surveys were made for Malurus Avenue and Mellor Park, the River Torrens and Breakout Creek, Apex Park Wetland, Burbridge Road at West Beach and the West Beach Trust land immediately west of the Airport, including the West Beach Stormwater Basin, the Patawalonga Creek, the playing fields and the edges of the Westward Ho Golf Courses. Other areas surveyed by David Edey were the Brownhill Creek wetlands and adjacent paddocks south of the Airport, the Patawalonga Lake, drains and wetlands north and west of the Airport, the Lockleys Oval and parts of Grange, including Sturt's cottage environs and Kirkcaldy Park.

Birds recorded from the Greater Reedbeds area were extracted from the Bird Reports of the SAOA published in the *South Australian Ornithologist* from 1963 onwards. Further observations were extracted from Volumes 1-6 (1972-2018) of *Bird Talk*, the journal of the Adelaide Ornithologists Club, including an article describing childhood memories of the birdlife of the Greater Reedbeds by Rix (1983). Records also came from the Breakout Creek part of the River Torrens and an adjacent swamp in Fulham for the period 1974-1977 (Whatmough 1978). A survey of the River Torrens based on three visits from October 1991 to April 1992 was analysed for records from the three sections of the river that are pertinent to this study (Paton and Pedler 1999).

Table 1. Bird species recorded from the Greater Reedbeds area from all time periods (see text for details of sources). Escapees, vagrant seabirds and coastal species are excluded. Where there is only one record for a time period, the date is given in the table. Taxonomy and nomenclature follow Horton *et al.* (2020).

Column 1: species recorded prior to about 1880 (White 1919a; Gould 1865; SAMA records).

Column 2: S. A. White's records (White 1919a, 1925), assessed by White (1919a) as: episodic – EP; autumn/winter visitors – AUT; occasional – OCC; introduced – I.

Column 3: sight records and SAMA records up to 1945.

Column 4: sight records and SAMA records post-1945. Bolded records are those of P. Paton.

Columns 5, 6 and 7: observations made by Whatmough (1978), Paton and Pedler (1999) and D. Edey (unpublished personal data 1995-2020), respectively.

P – present; B – breeding; D – declining; FO – flying over; R – rare; S – skin specimen; SK – skeleton specimen; E – egg clutch specimen; SP – spirit specimen; * – introduced.

Common Name	Scientific Name	1	2	3	4	5	6	7
		≤1880	White	≤1945	≥1946	1978	1999	Edey
Emu	<i>Dromaius novaehollandiae</i>	P						
Stubble Quail	<i>Coturnix pectoralis</i>		B D	P B; S E	P			
Brown Quail	<i>Coturnix ypsilophora</i>			P B; S E	P			
Magpie Goose	<i>Anseranas semipalmata</i>	P		P R				
Chestnut Teal	<i>Anas castanea</i>		P	P	P	P	P	P
Grey Teal	<i>Anas gracilis</i>		P D	P; S	P	P	P	P
Mallard*	<i>Anas platyrhynchos</i>				P B	P	P B	P
Mallard/Pacific Black Duck	(hybrid)				P B		P B	B
Pacific Black Duck	<i>Anas superciliosa</i>		B D	P B; S E	P	P	P	B
Hardhead	<i>Aythya australis</i>		P D	P B; S	P	P		P
Musk Duck	<i>Biziura lobata</i>		P R	P	P	P		P
Muscovy Duck*	<i>Cairina moschata</i>				P			P
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>			P B R; E	P			
Maned Duck	<i>Chenonetta jubata</i>		P R	P; S	P B; S	P		B
Black Swan	<i>Cygnus atratus</i>		P D	P; S	P B	P		P
Pink-eared Duck	<i>Malacorhynchus membranaceus</i>		P D	P; S	P			P
Blue-billed Duck	<i>Oxyura australis</i>	P			P			P
Australasian Shoveler	<i>Spatula rhynchotis</i>		B D	P B; S E	P	P		B
Freckled Duck	<i>Stictonetta naevosa</i>		P D	P	P			P
Australian Shelduck	<i>Tadorna tadornoides</i>		P D	P	P			
Tawny Frogmouth	<i>Podargus strigoides</i>		P D	P B	P; SK			
Spotted Nightjar	<i>Eurostopodus argus</i>		P R	P R				
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>				P			
Pacific Swift	<i>Apus pacificus</i>		P	P R; S	P			
White-throated Needletail	<i>Hirundapus caudacutus</i>			P R	P			
Australian Bustard	<i>Ardeotis australis</i>		P D	P				
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>		P	P B R; S	P			

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Pallid Cuckoo	<i>Cacomantis pallidus</i>		P	P B; S E	P			P
Horsfield's Bronze Cuckoo	<i>Chalcites basalus</i>		P	P B; S E	P			?B
Shining Bronze Cuckoo	<i>Chalcites lucidus</i>		P D	P				
Black-eared Cuckoo	<i>Chalcites osculans</i>			P	P; S K			
Feral Pigeon*	<i>Columba livia</i>			P; S E	P B	P	P	P
Peaceful Dove	<i>Geopelia placida</i>			P B; S E				
Crested Pigeon	<i>Ocyphaps lophotes</i>			P B	P B; S S P	P	P B	P
Common Bronzewing	<i>Phaps chalcoptera</i>	P	P R	P R				
Brush Bronzewing	<i>Phaps elegans</i>				P			
Spotted Dove*	<i>Spilopelia chinensis</i>				P	P	P	B
Barbary Dove*	<i>Streptopelia risoria</i>				P			P
Eurasian Coot	<i>Fulica atra</i>		P D	P; S	P B; S	P B	P B	P
Dusky Moorhen	<i>Gallinula tenebrosa</i>		B D	P B; S	P B; S	P	P B	P
Buff-banded Rail	<i>Hypotaenidia philippensis</i>			P B; S E	P			P
Australasian Swamphen	<i>Porphyrio melanotus</i>			P B; S E	P B		P	P
Australian Crake	<i>Porzana fluminea</i>		B D	P B; S E	P; S; S K	P		P
Black-tailed Nativehen	<i>Tribonyx ventralis</i>		P D	P B; S S K	P B	P	P	P
Baillon's Crake	<i>Zapornia pusilla</i>	S	P R	P B; E	P			
Spotless Crake	<i>Zapornia tabuensis</i>		P		P			
Brolga	<i>Antigone rubicunda</i>	P						
Great Crested Grebe	<i>Podiceps cristatus</i>		P R	P	P		P	
Hoary-headed Grebe	<i>Poliiocephalus poliocephalus</i>		P D	P B; S E	P	P	P	P
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>		P R	P B	P B; E	P		P
Little Buttonquail	<i>Turnix velox</i>		B D	P B; S	P			
Bush Stonecurlew	<i>Burhinus grallarius</i>		P D	P B; S				
Banded Stilt	<i>Cladorhynchus leucocephalus</i>		P D	P				
Pied Stilt	<i>Himantopus leucocephalus</i>		B D	P B; S E	P B 1976	P B	P	P
Red-necked Avocet	<i>Recurvirostra novaehollandiae</i>		P R	P	P			P
Double-banded Plover	<i>Charadrius bicinctus</i>		P R	P	P			
Red-capped Plover	<i>Charadrius ruficapillus</i>		B	P B; S E	P B 1980			
Oriental Plover	<i>Charadrius veredus</i>				P			
Black-fronted Dotterel	<i>Elsayornis melanops</i>	E	B D	P B; E	P B	P	P	P
Red-kneed Dotterel	<i>Erythrogonys cinctus</i>		B D	P B; E	P; E	P B		P
Pacific Golden Plover	<i>Pluvialis fulva</i>				1967			
Hooded Plover	<i>Thinornis cucullatus</i>				P			
Masked Lapwing	<i>Vanellus miles</i>	E	B D	P B; S E	P B	P	P	
Banded Lapwing	<i>Vanellus tricolor</i>	E	B D	P B; E	P B; S K	P		
Australian Painted-snipe	<i>Rostratula australis</i>		P	P B; S E	P			
Plains-wanderer	<i>Pedionomus torquatus</i>			S 1902				

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Common Sandpiper	<i>Actitis hypoleucos</i>				P	P		P
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>		P	P; S SK	P	P		
Curlew Sandpiper	<i>Calidris ferruginea</i>		P	P	1969			
Red-necked Stint	<i>Calidris ruficollis</i>		P D	P; S	P	P		
Latham's Snipe	<i>Gallinago hardwickii</i>			P; S	2012	P		P
Bar-tailed Godwit	<i>Limosa lapponica</i>		P	P				
Far Eastern Curlew	<i>Numenius madagascariensis</i>		P	P				
Wood Sandpiper	<i>Tringa glareola</i>			S	P; S	P		2000
Common Greenshank	<i>Tringa nebularia</i>				P	P	P	
Marsh Sandpiper	<i>Tringa stagnatilis</i>				1967			
Australian Pratincole	<i>Stiltia isabella</i>		P	P	1965			
Silver Gull	<i>Chroicocephalus novaehollandiae</i>		P	P; S	P; SK	P	P	
Kelp Gull	<i>Larus dominicanus</i>				1969			
Pacific Gull	<i>Larus pacificus</i>		P R	P				
Whiskered Tern	<i>Chlidonias hybrida</i>			P; S	P	P		P
Australian Tern	<i>Gelochelidon macrotarsa</i>		P D	P				
Caspian Tern	<i>Hydroprogne caspia</i>		P R	P	P	P	P	P
Fairy Tern	<i>Sternula nereis</i>					P		
Greater Crested Tern	<i>Thalasseus bergii</i>		P	P	P	P		
Australasian Darter	<i>Anhinga novaehollandiae</i>				P	P		P
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>		P D	P; S	P B		P	B
Great Cormorant	<i>Phalacrocorax carbo</i>		P D	P	P	P		P
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>		P R	P; S	P	P	P	P
Pied Cormorant	<i>Phalacrocorax varius</i>		P D	P; S	P	P		P
Yellow-billed Spoonbill	<i>Platalea flavipes</i>		P R	P; S	P; S	P	P	P
Royal Spoonbill	<i>Platalea regia</i>		P D	P	P	P	P	P
Glossy Ibis	<i>Plegadis falcinellus</i>	P	P D	P	P	P		
Australian White Ibis	<i>Threskiornis molucca</i>		P D	P; S	P	P	P	P
Straw-necked Ibis	<i>Threskiornis spinicollis</i>		P	P; S	P	P		P
Great Egret	<i>Ardea alba</i>		P D	P; S	P	P	P	P
Intermediate Egret	<i>Ardea intermedia</i>				2004			
White-necked Heron	<i>Ardea pacifica</i>		P D	P B	P			
Australasian Bittern	<i>Botaurus poiciloptilus</i>		P R	P B; E				
Little Egret	<i>Egretta garzetta</i>				P			P
White-faced Heron	<i>Egretta novaehollandiae</i>	B	B D	P B; E	P B; S		P	B
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	P	P	P; S	P; S			P
Australian Pelican	<i>Pelecanus conspicillatus</i>		P D	P	P	P	P	P
Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>		P R	P	P; S			P
Brown Goshawk	<i>Accipiter fasciatus</i>		P D	P; S	P			P

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Grey Goshawk	<i>Accipiter novaehollandiae</i>	P			S 1949			
Wedge-tailed Eagle	<i>Aquila audax</i>		P D	P	P			
Swamp Harrier	<i>Circus approximans</i>		B R	P B; E	P			
Spotted Harrier	<i>Circus assimilis</i>				P			
Black-shouldered Kite	<i>Elanus axillaris</i>		B D	P B; S SK	P	P	P	P
White-bellied Sea Eagle	<i>Haliaeetus leucogaster</i>				P			P(FO)
Whistling Kite	<i>Haliastur sphenurus</i>	B	B D	P B; S	P			2020
Little Eagle	<i>Hieraaetus morphnoides</i>		P R		P			
Square-tailed Kite	<i>Lophoictinia isura</i>							2016
Black Kite	<i>Milvus migrans</i>							FO 2018
Eastern Barn Owl	<i>Tyto javanica</i>		P EP	P B; S E	P; S			
Australian Boobook	<i>Ninox boobook</i>		P D	P; S	P; S			B
Azure Kingfisher	<i>Ceyx azureus</i>		P D	P R B; S E				
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	P	P I	P B; S E	P			?B
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	P		P R				
Sacred Kingfisher	<i>Todiramphus sanctus</i>		P D	P B; S E	P			P
Rainbow Bee-eater	<i>Merops ornatus</i>		P D	P	P			
Brown Falcon	<i>Falco berigora</i>		B R	P B	P			
Nankeen Kestrel	<i>Falco cenchroides</i>		P	P B; S	P B; SK	P	P	P
Grey Falcon	<i>Falco hypoleucos</i>			P; S 1890				
Australian Hobby	<i>Falco longipennis</i>	S	P R	P; S	P B; S		P	P
Peregrine Falcon	<i>Falco peregrinus</i>		P R	P; S	P			P
Black Falcon	<i>Falco subniger</i>				P			P(FO)
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>		P D	P	P			B
Little Corella	<i>Cacatua sanguinea</i>		P EP	P	P			?B
Long-billed Corella	<i>Cacatua tenuirostris</i>				P			?B
S-c Cockatoo / L-b Corella	(hybrid)							P
Galah	<i>Eolophus roseicapilla</i>		B EP	P B; S	P; S SK	P		B
Cockatiel	<i>Nymphicus hollandicus</i>		P D	P	1969			
Yellow-tailed Black Cockatoo	<i>Zanda funerea</i>	P			P			P
Australian Ringneck	<i>Barnadius zonarius</i>			P	???			???
Musk Lorikeet	<i>Glossopsitta concinna</i>		P D	P B; S E	P	P	P	B
Swift Parrot	<i>Lathamus discolor</i>	P; S						
Budgerigar	<i>Melopsittacus undulatus</i>		B D	P B; S	P			
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	1839						
Blue-winged Parrot	<i>Neophema chrysostoma</i>				1964			
Elegant Parrot	<i>Neophema elegans</i>	P		S	???	P		
Rock Parrot	<i>Neophema petrophila</i>				P			
Purple-crowned Lorikeet	<i>Parvipsitta porphyrocephala</i>		P	P; S	P	P		P

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Little Lorikeet	<i>Paroipsitta pusilla</i>		P	P; S				
Eastern Ground Parrot	<i>Pezoporus wallicus</i>		B; S					
Adelaide (Crimson) Rosella	<i>Platycercus elegans</i> ssp.		P D	P; S	P			P
Eastern Rosella	<i>Platycercus eximius</i>		P	P; S	P			P
Crimson/Eastern Rosella	(hybrid)			P				P
Regent Parrot	<i>Polytelis anthopeplus</i>			P				
Red-rumped Parrot	<i>Psephotus haematanotus</i>		B D	P B	P			P1990s
Rainbow Lorikeet	<i>Trichoglossus moluccanus</i>		P D	P	P		P	B
Brown Treecreeper	<i>Climacteris picumnus</i>	P	P R	P B; E				
Superb Fairywren	<i>Malurus cyaneus</i>	S	P	P B; S	P B			?B
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>		P EP	P	1990			
Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>		P	P; S	P			P
Red Wattlebird	<i>Anthochaera carunculata</i>		P D	P; S	P B	P	P B	P
Little Wattlebird	<i>Anthochaera chrysoptera</i>		B	P B; S	P B	P	P B	P
Regent Honeyeater	<i>Anthochaera phrygia</i>			P R; S				
Yellow-faced Honeyeater	<i>Caligavis chrysops</i>			P R; S				
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>				2010			
White-fronted Chat	<i>Epthianura albifrons</i>		P	P B; S E	P			
Orange Chat	<i>Epthianura aurifrons</i>	S E	P R	P; S E				
Crimson Chat	<i>Epthianura tricolor</i>		P R	P				
Singing Honeyeater	<i>Gavicalis virescens</i>		P D	P; S	P	P	P	B
Noisy Miner	<i>Manorina melanocephala</i>		P	P B; S	P B	P	P B	P
Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>			P				
Black-chinned Honeyeater	<i>Melithreptus gularis</i>		P D	P; S	P			B2006
White-naped Honeyeater	<i>Melithreptus lunatus</i>		P D	P; S	P			2020
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>		B	P B; S	P B	P	P B	P
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>		P R	P; S				
White-plumed Honeyeater	<i>Ptilotula penicillata</i>	E	P D	P B; S	P B	P	P B	P
White-fronted Honeyeater	<i>Purnella albifrons</i>				P			
Spotted Pardalote	<i>Pardalotus punctatus</i>	P	P D	P B; S	P B			
Striated Pardalote	<i>Pardalotus striatus</i>		P D	P B; S E	P			?B
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>		B D	P D B; S E	P B			B
Yellow Thornbill	<i>Acanthiza nana</i>				P			P
Southern Whiteface	<i>Aphelocephala leucopsis</i>		B D	P B				
White-throated Gerygone	<i>Gerygone olivacea</i>							1995
White-browed Scrubwren	<i>Sericornis frontalis</i>		B D	P B				
Weebill	<i>Smicronis brevirostris</i>		P R	P	1997			
White-browed Babbler	<i>Pomatostomus superciliosus</i>	P	B D	P B	P			
Dusky Woodswallow	<i>Artamus cyanopterus</i>		P D	P B; S				

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Masked Woodswallow	<i>Artamus personatus</i>		B EP	P B; E				
White-browed Woodswallow	<i>Artamus superciliosus</i>		B EP	P B				
Grey Butcherbird	<i>Cracticus torquatus</i>		P R	P				
Australian Magpie	<i>Gymnorhina tibicen</i>		B	P B; S SK	P B ; S SK	P	P	P
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>		P	P; S	P	P	P	P
White-bellied Cuckooshrike	<i>Coracina papuensis</i>			P; S				
White-winged Triller	<i>Lalage tricolor</i>		B R	P B; E	P			P
Crested Shriketit	<i>Falcunculus frontatus</i>		B D	P B; S E				
Grey Shrikethrush	<i>Colluricincla harmonica</i>		B D	P B; S E	P			
Australian Golden Whistler	<i>Pachycephala pectoralis</i>		P AUT	P; S	P ; SP			P
Rufous Whistler	<i>Pachycephala rufiventris</i>	S	P AUT	P; S	P			P1990s
Olive-backed Oriole	<i>Oriolus sagittatus</i>		P AUT	P; S				
Grey Fantail	<i>Rhipidura albiscapa</i>		B AUT	P B	P			P
Willie Wagtail	<i>Rhipidura leucophrys</i>		P D	P B; S E	P B	P	P B	P
Magpielark	<i>Grallina cyanoleuca</i>		B D	P B; S	P B ; S	P	P B	P
Restless Flycatcher	<i>Myiagra inquieta</i>		P D AUT	P R; S				
Little Raven	<i>Corvus mellori</i>		P D	P B	P B ; S	P	P	B
Apostlebird	<i>Struthidea cinerea</i>				P			
Hooded Robin	<i>Melanodryas cucullata</i>			P; E				
Jacky Winter	<i>Microeca fascians</i>		P D	P B; E				
Scarlet Robin	<i>Petroica boodang</i>		P AUT	P R	P			
Red-capped Robin	<i>Petroica goodenovii</i>		P OCC	P	P			
Flame Robin	<i>Petroica phoenicea</i>	P	P AUT	P	P			
Rose Robin	<i>Petroica rosea</i>				P			
Eurasian Skylark*	<i>Alauda arvensis</i>			P	P	P		P
Horsfield's Busk Lark	<i>Mirafrja javanica</i>		P D	P B; E				
White-backed Swallow	<i>Cheramoeca leucosterna</i>		B R	P B; S E				P2013
Welcome Swallow	<i>Hirundo neoxena</i>		P	P B; S	P B	P		P
Fairy Martin	<i>Petrochelidon ariel</i>		B R	P B; E	P B	P B	P	B
Tree Martin	<i>Petrochelidon nigricans</i>		P D	P B; S E	P	P	P	P
Australian Reed Warbler	<i>Acrocephalus australis</i>		B D	P B; S E	P B		P	P
Brown Songlark	<i>Cincloramphus cruralis</i>		B D	P B; E	P	P		P
Rufous Songlark	<i>Cincloramphus mathewsi</i>		B D	P B; E				
Little Grassbird	<i>Poodytes gramineus</i>		P R	P B; E	P	P	P	B
Golden-headed Cisticola	<i>Cisticola exilis</i>	E		P B; S	P	P		
Silvereve	<i>Zosterops lateralis</i>		P	P; S	P	P		B
Common Myna*	<i>Acridotheres tristis</i>				P			
Common Starling*	<i>Sturnus vulgaris</i>			P	P ; SP	P	P B	B
Common Blackbird*	<i>Turdus merula</i>			P	P ; S SP	P	P B	B

Common Name	Scientific Name	≤1880	White	≤1945	≥1946	1978	1999	Edey
Bassian Thrush	<i>Zoothera lunulata</i>			S 1945				
Mistletoebird	<i>Dicaeum hirundinaceum</i>		P D	P; S	P			P
House Sparrow*	<i>Passer domesticus</i>			P B; S	P	P	P B	B
Red-browed Finch	<i>Neochmia temporalis</i>		B D	P B; S	P			
Beautiful Firetail	<i>Stagonopleura bella</i>	P						
Diamond Firetail	<i>Stagonopleura guttata</i>		B D	P B; S				
Zebra Finch	<i>Taeniopygia guttata</i>	E	P	P B; S	P	P		
Australian Pipit	<i>Anthus australis</i>		B D	P B; S E	P	P		P
European Goldfinch*	<i>Carduelis carduelis</i>			P	P	P		P
European Greenfinch*	<i>Chloris chloris</i>			P	P; SK	P		P

?** possible escapee from captivity; ?*** unidentified *Neophema* sp., probably *N. elegans*

RESULTS

Table 1 shows the 230 bird species and three hybrids recorded from the Greater Reedbeds area from the sources listed above. The table excludes probable escapee birds, vagrant seabirds driven inland by rough weather and birds flying over unless they were using the airspace for feeding/foraging. I have also excluded coastal species that are generally found on beaches, as White, Mellor and the early ornithologists did not record these birds and they usually occur outside the study area.

Column 1 of Table 1 is bird species recorded by White (1919a) as being seen prior to 1880 in his father's and grandfather's time, one species recorded by Gould (1865) and specimens in the SAMA collected before 1880. Regrettably this list is incomplete as White did not give a full list of species seen by his father and grandfather. Several of these species were extinct by the time S. A. White began recording, but others were seen by him or J. W. Mellor in the late nineteenth and early twentieth centuries. Column 2 lists 155 species that White and his family had recorded in the Reedbeds area (White 1919a, 1925). About half of this number (80 species) was regarded as declining (marked with a 'D') by White (1919a) and some he regarded as extinct. These latter 30 species are

marked as 'R' (rare) to indicate that S. A. White considered them to have been lost from the area, but there are later records for them, albeit some of these are vagrant records. Column 2 provides additional information based on White's papers indicating species that he regarded as episodic, occasional and autumn/winter visitors, as well as one native species that was thought to have been reintroduced. Column 3 lists bird species that S. A. White and J. W. Mellor and other observers published in the *South Australian Ornithologist* from 1914 to 1945, as well as Rix's observations for the period 1910-1930 (Rix 1983). Skin specimens and egg clutches in the SAMA collected from 1880 to 1945 are included in this column.

Column 4 combines my records from 1988 to 2020 (bolded) and published and unpublished records from the period 1946 to 2020. This includes records of birds from the Royal Adelaide GC and specimens in the SAMA collected after 1945.

Column 5 lists the species recorded from an intensive survey of the Breakout Creek section of the River Torrens and an adjacent swamp at Fulham during 1974-1977 (Whatmough 1978). There were species seen in these surveys that were not recorded by me or other observers in this time period. Column 6 records bird species

seen in three visits between October 1991 and February 1992 in the Breakout Creek section of the River Torrens (Paton and Pedler 1999). Columns 5 and 6 list birds that were present as well as those where breeding was confirmed. Column 7 lists the species seen by David Edey from 1995 to the present during his residence in Fulham and Lockleys and from searches over much of the Greater Reedbeds area accessible to the public.

Species compositions have changed significantly between time periods, with eight species becoming extinct by the 1880s, an additional 60 species later declining to extinction or extreme rarity and 16 species disappearing over many decades, only to be recorded in the past 30 years. Four bird species colonised the area during the early years of the twentieth century and five species of introduced birds and 27 native bird species were only recorded post-1945.

DISCUSSION

While most bird species can be grouped easily for discussion of their abundance and status, there are a few that cannot be slotted into the categories below. These include the Grey Falcon, which is represented only by a SAMA specimen collected in 1890 at Fulham, although a pair attempted to nest at Grange GC in October 1995 and a single bird was recorded there in February 2001 (D. Carter pers. comm.). The Grey Goshawk was recorded by Samuel White prior to 1880 (White 1919a) and there is a SAMA specimen from Fulham from 1949, but no other records. Both species can be regarded as vagrants.

Bird species that became extinct prior to 1945

Since European colonisation many bird species disappeared from the Greater Reedbeds area and, from White's (1919a) paper, eight of these were probably lost in the 1800s (Table 2). White (1919a) suggested that his father saw Magpie Geese but that he himself did not; however, Rix (1983) reported seeing four or five of this species in 1916

on what became Adelaide Airport land. There have been no further records of this species on the Adelaide Plains.

Table 2. Bird species only recorded in the Greater Reedbeds area prior to about 1900 (White 1919a; Mathews 1921-22; Gould 1865; SAMA records).

See text for further details of some species.

Emu
Brolga
Swift Parrot
Orange-bellied Parrot
Eastern Ground Parrot
Orange Chat
Crimson Chat
Beautiful Firetail

John Gould saw Orange-bellied Parrots in 1839 in the Reedbeds area: 'On visiting South Australia in winter, I there found it equally abundant on the flat, marshy grounds bordering the coast, especially between Port Adelaide and Holdfast Bay' (Gould 1865). Carpenter and Black (2015) confirm that Gould's sighting was in July of 1839 and was thus of birds wintering on the mainland. The species was not seen by S. A. White or John Mellor so was probably extinct or rare in the region by the 1890s and probably earlier as it was not recorded by White's ancestors either.

Of the Eastern Ground Parrot, White said in correspondence with Gregory Mathews (Mathews 1916-17):

These rare birds were once very common on the Adelaide plains, and both my father and his brother have spoken of the numbers the black boys snared with horsehair snares and have also spoken of the many nests these boys would find in a day and the eggs devoured by them. The birds had become extinct as far as this locality is concerned before my days of observation began...

Of the Orange Chat, White said: 'I have seen it

as far south as the Reed beds, but only on rare occasions ...' (Mathews 1921-22) and 'has not been seen for very many years' (White 1919a). While modern bird observers regard both Orange and Crimson Chats as mainly inhabitants of the arid and semi-arid parts of Australia, White's (1919a) paper asserted that both species were regular summer migrants to the samphire flats of the Reedbeds region. Observations of the Orange Chat in the Strathalbyn area from 1963 to 2007 indicated that the species was at least partially nomadic in this part of South Australia, which is about 50 km south-east of the Greater Reedbeds (Eckert 2014). The species was recorded there in 51% of these 45 years and first records for the year varied widely from late summer through to spring, with breeding occurring on several occasions in spring and late summer.

In addition to these species are two others that have disappeared but probably did not do so as early. White (1919a) noted that the Striped Honeyeater had been recorded, but did not say by whom or how often. Apart from two skins in the SAMA collected on 14 July 1912 at Wetunga (or Weetunga, the White family home built in the late 1870s), there are no other documented records for the Reedbeds, so the species can be considered extinct in the area. The Horsfield's Bush Lark was seen rarely by White (1919a) prior to 1919 and was not recorded after this by either White or Mellor, and there have been no records since that time.

A further two species are each represented only by a single SAMA specimen: a Plains-wanderer collected at Fulham in 1902 and a Bassian Thrush collected in 1945, also at Fulham. Neither species has been recorded since then and both were probably only ever occasional visitors to the Greater Reedbeds.

Bird species that disappeared prior to 1945 but have been recorded post-1980

Some bird species ceased to be recorded

Table 3. Bird species recorded in the early period in the Greater Reedbeds area, disappeared for a number of years and have been recorded in the modern period.

Musk Duck
Cape Barren Goose
Blue-billed Duck
Australasian Shoveler
Freckled Duck
Baillon's Crake
Spotless Crake
Great Crested Grebe
Australasian Grebe
Little Black Cormorant
Yellow-billed Spoonbill
Collared Sparrowhawk
Little Eagle
Yellow-tailed Black Cockatoo
White-backed Swallow
Golden-headed Cisticola

either before or during S. A. White's time as a dedicated ornithologist, up until about 1930, but have been recorded in recent times (Table 3). The development of constructed wetlands explains the reappearance of waterbirds, some of which are fairly common, like the Australasian Grebe, while others are rare or vagrant. For example, there are only two recent records of Musk Ducks: the species was reported at Adelaide Airport in 1996 and a female was at the mouth of Breakout Creek on 10 October 2014. While Australasian Shovelers are fairly rare in the Reedbeds, there is one breeding record of a pair with five ducklings on Brownhill Creek adjacent James Melrose Road on 22 October 2020.

Two species, Blue-billed Duck and Great Crested Grebe, were recorded by Samuel White but not by S. A. White, but have been reported in the modern period. One Blue-billed Duck was seen on the Patawalonga Creek west of Tapleys Hill Road on 8 September 2009 by me, three were seen in a similar area on 6 June 2017 and one in the same place on 15 October 2017 (D. Edey

pers. comm.). One Great Crested Grebe was seen on the Patawalonga Creek in early March 1991 (Rix 1992) and one bird in breeding plumage was seen in the lower reaches of the River Torrens in October-November 1991 (Paton and Pedler 1999).

Wetland restoration may also explain the two recent records of Golden-headed Cisticola, of two birds on the banks of the Outlet Channel near the swamp at Fulham in August 1975 (Whatnough 1978) and a bird I recorded in the Apex Park constructed wetland in about 2000. White (1919a) reported that this species had disappeared, but had been once very common in the Reedbeds district. The cisticola is now regarded as vagrant. A different explanation may be required for the other terrestrial species. There is only one record in the modern period of the White-backed Swallow, a single bird flying over Fulham on 17 January 2013 (D. Edey pers. comm.), so this also is a vagrant rather than a species returning to the area.

Paton *et al.* (1994) documented an increase in distribution of the Collared Sparrowhawk from 1974-75 to 1984-85 in the Southern Mount Lofty Ranges and the Adelaide Plains. So its reappearance in the Reedbeds area may be part of a more general increase in range and abundance over the second half of the twentieth century.

The Yellow-tailed Black Cockatoo was not seen by S. A. White but was recorded by his father Samuel (White 1919a), who died in 1880, so we can assume that this species disappeared from the Reedbeds before 1880. S. A. White assigned its disappearance to the clearance of Silver Banksia *Banksia marginata/Callitris gracilis/Allocasuarina verticillata* woodlands that occupied the old red consolidated sand dunes that once stretched discontinuously from Queenstown to Camden Park and even further south to Somerton (Kraehenbuehl 1996). From information on plant species occurring in these woodlands, the plant most likely to have provided food for the Yellow-tailed Black

Cockatoo is *Banksia marginata*. Other genera that the cockatoo feeds on include *Allocasuarina*, *Acacia* and *Hakea* (Higgins 1999); I cannot find any record from the sand dunes of any of the *Hakea* species that are an important food source for the cockatoos in the Mount Lofty Ranges (MLR), but *Allocasuarina verticillata* and several acacias occurred in this area and may have supplemented food from the banksias. Kraehenbuehl (1996) commented that Yellow-tailed Black Cockatoos 'once frequented the site of Kooyonga Golf Links' but does not give the source for his information.

Yellow-tailed Black Cockatoos returned to the Adelaide Plains, including the western suburbs, from the early 2000s. Singletons and small groups are now regularly sighted feeding in introduced pine trees from late October to February, with the largest total being about 50 birds at Kooyonga GC on 11 February 2017 (G. Carpenter pers. comm.). There are several alternative explanations for this changed behaviour. One is that there is an increase in numbers in the Adelaide/MLR region, thus forcing the birds to find new feeding grounds. This is unlikely as counts in 2011 and 2012 indicate a static population of about 2000 birds (Carpenter *et al.* n.d.). Another explanation is that the removal of pines in the MLR, to improve the quality of native vegetation, has reduced their food there, thus forcing them to find new areas of pines. Linked to this is the possibility that the Ash Wednesday fires in 1983 burnt substantial amounts of pine trees in the MLR that the birds were dependent on for food. Observers in the eastern foothills noted an increase in sightings of Yellow-tailed Black Cockatoos after 1983 (A. Black pers. comm.). A third explanation is that the Millennium Drought (2001-2009) severely depleted their food resources in the MLR, thus forcing them to search a wider area for food.

Linked to the two previous explanations is a fourth - that birds are coming to the plains during the breeding season as there is a dearth of food near their nesting trees in the hills

(Carpenter *et al.* n.d.). This explanation is supported by my observations at the golf courses over the past 15 years suggesting that most of the cockatoos are male birds. Presumably they are feeding on the plains and returning to the hills to feed the females when they are brooding eggs and, later the young birds, which are largely fed by male birds from about 10 days old (Higgins 1999). Another issue may be the explosion in the number of Little Corellas in the Adelaide region over the past 20 years. Large flocks of this species move across the region and can strip a pine tree of cones in about 30 minutes. They are aggressive birds and, as their flocks can number in the thousands, they may be competing with Yellow-tailed Black Cockatoos for food and for nesting hollows.

The occurrence of Yellow-tailed Black Cockatoos in areas previously unknown or after a gap of some years has occurred in other regions of Australia; for example in New South Wales, birds reappeared in the 1990s in the outer suburbs of Sydney, especially in pine plantations and golf courses (Higgins 1999).

While Cape Barren Geese occasionally occur at Adelaide Airport and on wetlands in the area, so cannot be classed as extinct, they are much less common than they were in the nineteenth century. There is a clutch of Cape Barren Goose eggs in the SAMA collected on 18 August 1903. At first these were considered likely to have come from Mellor's extensive aviaries, as there are few documented records of breeding of this species on the Australian mainland. However, notes with the clutch, which came to the Museum via the J. N. McGilp Collection, say

Thinking that this clutch was produced by domesticated Cape Barren Geese I [McGilp] asked Mr Mellor if it was so. He informed me that at one time these geese were frequently to be seen at the Reedbeds and that they bred down on the swamps. This set was almost the last taken by him; since this

date the geese have gradually cleared right away from the swamps.

Mellor's notes on the clutch state 'Nest on ground in clump of grass & reeds, composed of reed leaves, grass etc., & warmly lined with down from the bird's breast, making a complete covering for the eggs' (P. Horton pers. comm.). The only other substantiated record of breeding Cape Barren Geese on the SA mainland is from 1968 when a pair built a nest and laid eggs at Angle Swamp in the Gawler Ranges (Parker *et al.* 1985).

White (1919a) said of the Little Eagle that it was 'never plentiful' and 'never seen now', suggesting that by 1919 it was extinct in the region. Modern records come from the Adelaide Airport and all are from February to July and from the period 1990-2003, despite an observation period extending to 2016, suggesting that such incursions into the suburbs are decreasing. Apart from White's (1919a) observations, there are no reports of Little Eagles on the Adelaide Plains before the 1970s and all records since then are between summer and early winter, suggesting that this is a post-breeding dispersal of immature birds (G. Carpenter, pers. comm.).

While not strictly fitting the category of species absent between 1945 and 1980, the Rainbow Lorikeet followed a similar trend. Although noted as declining by White (1919a), it was recorded in the period up to 1945, but at some time after this it seems to have disappeared from the western suburbs of Adelaide and presumably from the Greater Reedbeds area. For example, in the intensive surveys of the River Torrens from 1974 to 1977 documented by Whatmough (1978), the species was not recorded from the Outlet Channel and was only recorded from the City of Adelaide and east thereof. From the 1970s onwards this species gradually spread to the west and increased hugely in abundance to the point in 2020 where it is one of the most common urban birds in

Table 4. Bird species that have declined in the Greater Reedbeds area, some to extinction or extreme rarity. Species in bold were recorded up to about 1945 but have not been recorded since.

Bird Species	Records from modern period
Tawny Frogmouth	1 at Kooyonga Golf Course 13/10/2014
Spotted Nightjar	
Australian Bustard	
Fan-tailed Cuckoo	1 along River Torrens 20/11/1991
Horsfield's Bronze Cuckoo	1 Apex Park 6/6/1995, 30/11/1999, 21/2/2011, 31/7/2011 & 21/7/2012; at Adelaide Airport, 2 on 9/7/2008 & 1 on 11/10/2015; at West Beach Stormwater Basin, 1 on 5/9/2000, 3 on 10/8/2017, 1 on 25/9/18; possible breeding August 2000, Fulham, and October 2017, West Beach Stormwater Basin (D. Edey pers. comm.)
Shining Bronze Cuckoo	
Peaceful Dove	
Common Bronzewing	
Bush Stonecurlew	
Banded Stilt	
Red-necked Avocet	1 on Patawalonga Creek 5/11/1992, 5/8/1993 & 23/12/1994; 2 on Patawalonga Creek 18/11/1993 & 20/9/1994; 2 on West Beach Stormwater Basin 21/6/2018 (D. Edey pers. comm.)
Red-kneed Dotterel	Fulham Swamp and Outlet Channel, 1974-77, breeding (Whatmough 1978); recorded on Patawalonga Creek regularly in early 1990s; last seen River Torrens, 18/2/2003
Australian Painted Snipe	1 in drain, Adelaide Airport, 29/8/1977; 1 on River Torrens on 18/2/2003
Sharp-tailed Sandpiper	recorded by Whatmough (1978)
Curlew Sandpiper	50+ on artificial lake at Glenelg on 22/10/1969
Red-necked Stint	recorded by Whatmough (1978)
Bar-tailed Godwit	
Far Eastern Curlew	
Australian Pratincole	1 on Patawalonga Golf Course on 10/7/1965
Pacific Gull	
Australian Tern	
Fairy Tern	recorded along the Outlet Channel or the River Torrens mouth in 1974 (Whatmough 1978)
Pied Cormorant	few records of single birds, 1974-77 (Whatmough 1978); 1 on River Torrens on 1/8/2006
White-necked Heron	1 on Glandore Oval, 3/12/2011
Australasian Bittern	1 in River Torrens outlet channel on 22/3/52 (Glover 1952)

Bird Species	Records from modern period
Azure Kingfisher	
Sacred Kingfisher	1 at Apex Park on 21/2/2011; 1 on Breakout Creek on 8/3/2014; 1 recorded at Royal Adelaide Golf Course
Rainbow Bee-eater	recorded at Royal Adelaide Golf Course in a list made in 2012
Cockatiel	5 at Glenelg on 25/10/1969
Little Lorikeet	
Red-rumped Parrot	2 at Collins Reserve, Fulham Gardens, 1990s (D. Edey pers. comm.); 1 flying over River Torrens (Breakout Creek) 25/8/2018
Brown Treecreeper	
Spiny-cheeked Honeyeater	recorded at Royal Adelaide Golf Course 1990
Regent Honeyeater	
Yellow-faced Honeyeater	
Brown-headed Honeyeater	
White-naped Honeyeater	1 at Breakout Creek on 3/3/2020 (D. Edey pers. comm.)
Southern Whiteface	
White-browed Scrubwren	
Weebill	recorded at Royal Adelaide Golf Course 1997
White-browed Babbler	present at Royal Adelaide Golf Course at least until 1972 (Glover 1973) and Grange Golf Course until 2002 (D. Carter pers. comm.)
Dusky Woodswallow	
Masked Woodswallow	
White-browed Woodswallow	
Grey Butcherbird	
White-bellied Cuckooshrike	
Crested Shriketit	
Grey Shrikethrush	1 at Kooyonga Golf Course on 18/8/1993
Olive-backed Oriole	
Restless Flycatcher	
Hooded Robin	
Jacky Winter	
Scarlet Robin	last seen at Royal Adelaide Golf Course in mid-1980s
Red-capped Robin	recorded at Royal Adelaide Golf Course in a list made in 2012
Flame Robin	1 at Adelaide Airport on 13/5/2006
Horsfield's Bush Lark	
Rufous Songlark	
Red-browed Finch	several birds at Glenelg Golf Course on 18/8/2015; 2 birds at Kooyonga Golf Course 2015 (M. Campbell pers. comm.)
Diamond Firetail	
Zebra Finch	downstream of Lockleys on 21/5/1977 (Whatmough 1978)

Adelaide and extremely common in the Greater Reedbeds area. This species breeds annually in hollows in River Red Gums and White Cedar *Melia* sp. at Mellor Park, Lockleys Oval and Malurus Avenue at Lockleys and at most times is the most abundant lorikeet in the district (D. Edey pers. comm.).

Bird species that have declined, some to extinction, since about 1945

In addition to the species discussed above as being extinct prior to 1945, 60 additional species are now either extinct or very rare in the Greater Reedbeds area (Table 4). For 32 of these there are no recent records, so they must be considered as extinct or at least functionally extinct; they are bolded in Table 4.

Some of these species were common in the 60 years following colonisation, like Brown Treecreeper, Southern Whiteface and Dusky Woodswallow. Many species were resident, or were regular visitors, and some bred in the area. For example White (1919a) says of the Masked and White-browed Woodswallows: 'Visits the district at long intervals, generally in numbers, and remains to nest'. White also documented the loss of the Spotted Nightjar from the Reedbeds area: 'This was a common bird at the Reedbeds not so many years ago, but they have now disappeared. The last one which came under my notice was in 1915. They sit upon the ground in the daytime and become easy prey to domestic cats' (Mathews 1918-19). Mellor, quoted in Mathews (1918-19), regarded the Spotted Nightjar as uncommon on the Adelaide Plains and noted that their favoured habitat was sandy country well-clothed with trees and bushes. Other species were less abundant or regular before 1945 and these include White-bellied Cuckooshrike, Hooded Robin and Grey Butcherbird.

In addition to the 32 species that are considered to be extinct, there are another 28 species for which there are very few records in the post-

1945 period and/or numbers have declined sharply over the past ten to twenty years. These species, unbolded in Table 4, are now considered vagrant to the Reedbeds area and are shown with more recent records. As with the birds that are considered extinct, many of these species were common residents or commonly visited the area in the nineteenth and early twentieth centuries. For example, White (1919a) noted that the Australasian Bittern could be 'found in numbers, their deep, weird, booming sound could be heard so frequently echoing along the thick flag and reed swamps' but that by 1919 they had disappeared. The Weebill was described as 'once plentiful; not seen for many years' by White (1919a) and there is only one recent record from the Royal Adelaide GC from 1997.

White-browed Babblers were present on both Royal Adelaide GC and Grange GC in the second half of the twentieth century but there is no record of when they disappeared from the former, the last published record being of six to eight birds on 31 May 1972 (Glover 1973). The species was last seen at Grange GC in May 2002 and is not present now (D. Carter pers. comm.). Of the Rainbow Bee-eater, White commented: 'The Bee-eater was a spring and summer migrant to the Reedbeds in years gone by. Fifteen or twenty years ago there was never a summer passed without seeing many of the Bee-eaters, now I have heard them once only in the last ten years' (Mathews 1918-19).

Of the White-necked Heron, White said: 'It always nests on the Adelaide Plains during wet winters, but never in any numbers' (Mathews 1913-14). There are no corroborating egg clutches to verify this statement regarding breeding of this species in the Reedbeds and, as there are errors in some of White's observations to Mathews, this comment needs to be treated with caution. It may be that it refers to the more common White-faced Heron, which White (1919a) reported as breeding every year in the district. Mellor (1923) reported 36 White-necked Herons on swamps at Fulham in early October 1922, suggesting

that even in the 1920s this species visited the area in large numbers. Mellor did not mention breeding of this species in the Reedbeds in his correspondence with Mathews (Mathews 1913-14).

I recorded one Cockatiel at Breakout Creek on 28 May 2003 which I considered most likely to be an escapee, but the record of five birds at Glenelg in October 1969 (Glover 1972) was most likely to be of wild birds and coincided with an influx of this species into the south of the state. This situation contrasts with White's experience: 'This was once a numerous bird in the late summer on the Adelaide plains visiting us in great numbers, and I can remember an old bird catcher netting them in hundreds. They are seldom, if ever, seen here now' (Mathews 1916-17). Mellor reported that thousands of this species were caught annually by bird-trappers from flocks that came south after the breeding season and fed on the grassy flats behind the sand dunes along the Adelaide coastline (Mathews 1916-17). He intimated that most of the captured birds were destined for the European cage bird industry. While neither White nor Mellor suggested that the Cockatiel bred in the Greater Reedbeds, the species is a spring and summer migrant to the Strathalbyn area, where it breeds locally in most years (Eckert 2000). However there has been a decline in abundance over the 45 years from 1963 to 2007 in this area (Eckert 2014).

The Fairy Tern was recorded in the mid-1970s from the River Torrens Outlet Channel or River Torrens mouth (Whatmough 1978). This species has been included in Table 4 for completeness, although it is unclear from the paper whether the birds were on the beach or inland slightly. I have only recorded this species on the beach at the outlet and only up until the early 2000s. There are two more recent records from the River Torrens mouth: one bird on 24 September 2014 and eight birds on 26 September 2017, as well as records from West Beach north of the marina in December 2000 and September 2001 (D. Edey pers. comm.). This species has experienced a

catastrophic decline in South Australia over the past twenty to thirty years (DENR 2012).

The long list of species that have disappeared or become very rare since 1945 in the Reedbeds is unsurprising due to the increased urbanisation of the Reedbeds and the greater Adelaide area from the 1930s, but more particularly post-1945. In addition, some of these species have declined in abundance and distribution more broadly in South Australia, mainly due to clearance and fragmentation of habitat.

Bird species showing declines over the 1988-2020 period

There are 17 bird species that have declined over the past 30 years of more intensive surveying of the area (Table 5). For some of these species, including the Red-rumped Parrot, White-fronted Chat, Australian Golden Whistler, Rufous Whistler, Grey Fantail and Mistletoebird, this decline may reflect a more pervasive decline across the MLR and/or Adelaide region. For others, like the Stubble Quail, Banded Lapwing and Brown Songlark, the decline may also be the result of the increasing size of the urban area of Adelaide and higher density development of the urban area. Stubble Quail were recorded only at Adelaide Airport and were last heard there in 2011.

For the Pacific Black Duck, the cause of the decline is hybridisation with Mallards. A survey of the distribution and abundance of Mallards, Pacific Black Ducks and their hybrids in South Australia in 1987 concluded that Mallards and hybrids had increased in the Adelaide region since the 1970s and that the concomitant decline in Pacific Black Duck numbers in urban Adelaide, along the River Torrens, was linked to this increase (Paton *et al.* 1992). The only recent record of Pacific Black Duck was of a pair with fledglings at Breakout Creek, Lockleys, during October and November 2014 (D. Edey pers. comm.).

For the Royal and Yellow-billed Spoonbills, Straw-necked Ibis, Spotted Pardalote, Singing Honeyeater and Yellow-rumped Thornbill, the reasons for the decline are less clear but may be due to the reasons cited above and, for the small bush birds, the impact of abundant Noisy Miners. The decline of populations and abundance of Yellow-rumped Thornbills mirrors a similar decline documented by Whatmough (1997) in the Adelaide Parklands. In the twenty-one years between 1974 and 1995, monthly surveys of the Adelaide and North Adelaide Parklands identified the demise of three out of five groups of Yellow-rumped Thornbills, leaving just two groups totalling five or six birds. The last Yellow-rumped Thornbills were recorded in the Parklands in November 1998 (R. Whatmough pers. comm.). Whatmough (1997) could not attribute this decline to habitat changes alone.

Similar declines occurred across the greater Adelaide Airport area between the late 1980s and 2000s (pers. obs.). At Kooyonga GC surveys documented up to 20 Yellow-rumped Thornbills in the early 1990s but by 2000 numbers had dropped to about five and the last birds were sighted there in 2005. At Glenelg GC more than 20 birds were recorded in the early 1990s and birds bred on the course through the 1990s and into the 2000s. There were still up to 15 birds recorded between 2001 and 2010 but numbers dropped after this and only one to three birds were seen from 2016 to the present and not on every survey. Habitat changes on the golf courses may have had some impact on this species, but counts at Kooyonga GC of Noisy Miners indicate that they have increased threefold in the thirty years from 1990 to 2020 and their aggressive behaviour may be partly responsible for the demise of the Yellow-rumped Thornbill. However, Noisy Miners mainly occur on the boundaries of Glenelg GC and thornbills have drastically declined there as well, although the process occurred ten years later. Numbers and frequency of recording of Yellow-rumped Thornbills also declined at Grange GC from about 2006 and its status there is uncertain, but

likely to be vagrant (D. Carter pers. comm.).

A small group of up to seven Yellow-rumped Thornbills occupies the West Beach Trust land and breeding behaviour was observed there in the spring of 2019 (D. Edey pers. comm.). Another group occupies the Brownhill Creek wetland and the open land north of James Melrose Road (D. Edey pers. comm.) and is presumably the source of the few birds recorded at the adjacent Glenelg GC over the past few years. Despite the persistence of these two small groups, their long-term future is uncertain given the continuing commercial and industrial infill of Adelaide Airport land along James Melrose Road and the history of decline of other populations. The decline of the Yellow-rumped Thornbill may be the result of a complex mix of greater urban size, habitat change, interaction with other bird species and the species' ecology.

Table 5. Bird species that have declined between 1988 and 2020.

Stubble Quail
Pacific Black Duck
Red-capped Plover
Banded Lapwing
Yellow-billed Spoonbill
Royal Spoonbill
Straw-necked Ibis
Red-rumped Parrot
White-fronted Chat
Singing Honeyeater
Spotted Pardalote
Yellow-rumped Thornbill
Australian Golden Whistler
Rufous Whistler
Grey Fantail
Brown Songlark
Mistletoebird

The Singing Honeyeater showed a similar pattern to the Yellow-rumped Thornbill on the golf courses for which long-term data exist. At Kooyonga GC, where Noisy Miner numbers have

increased hugely since 1990, one to three and occasionally four Singing Honeyeaters were recorded in most censuses from the early 1990s to 2000, then numbers declined from 2001 to 2005, with the last bird recorded in March 2005. At Glenelg GC, one to a few were recorded in most censuses from 1990-1995, but the frequency of reporting dropped in the early 2000s and between 2002-2009 and 2015-2018, there were no records at all. Since 2018 one or two birds have been recorded in some censuses. Singing Honeyeaters are resident and bred in December 2001 on West Beach Trust land, which is their core area and links to the coastal dune system that they also occupy (D. Edey pers. comm.).

Australian Golden Whistlers were not recorded at Adelaide Airport, but did occur singly during autumn/winter at Kooyonga and Glenelg Golf Courses in the late 1990s and early 2000s, with the last sighting being at Kooyonga GC in May 2009. At nearby Grange GC, numbers and frequency of recording declined from 2006 (D. Carter pers. comm.). There was a record of an uncoloured bird along the River Torrens Linear Park near the sea on 24 May 2018. There are a few records of one or two birds from Apex Park, Ayton Avenue at Fulham and the West Beach Stormwater Basin from 1995 to 2020 (D. Edey pers. comm.). This species typically comes down to the Adelaide Plains from the MLR in small numbers during autumn and winter. Its local decline may be due to the higher density urban development occurring in the Reedbeds area and in many suburbs of Adelaide.

Like the preceding species, Rufous Whistlers were not recorded at Adelaide Airport, but there are two records of single birds from Glenelg GC in April 1997 and November 1999 and three from Kooyonga GC, of single birds in April 1993, May 1994 and May 1996. Rufous Whistlers were sporadic at Grange GC, with the last record of two birds being in 2005 (D. Carter pers. comm.). Solitary immature Rufous Whistlers were recorded twice in the 1990s from Ayton Avenue at Fulham (D. Edey pers. comm.).

The paucity of records suggests that this species must now be regarded as a vagrant to the Reedbeds area.

According to White (1919a) and Rix (1983), the Grey Fantail was a common breeding resident until the early twentieth century and then became a rare autumn/winter migrant to the Reedbeds, as it is today. Small numbers of this species come down to the Adelaide Plains from the MLR in the autumn and winter of most years and this pattern is reflected in my records from the golf courses. At Kooyonga GC one or two birds were seen in May of nine years between 1994 and 2015 and in August of 2006, but there are no records from there since 2015. At Glenelg GC there are records spanning April to August of most years between 1991 and 2020, with up to three or four birds being recorded on some mornings. However, since 2015 there are only two records, in August 2017 and May 2020, suggesting a recent decline. Grey Fantails were recorded at Breakout Creek in 2001, at Apex Park in 2014 and 2016 and from the West Beach Stormwater Basin in 2018 and 2019 (D. Edey pers. comm.).

Mistletoebirds were not recorded at Adelaide Airport or Kooyonga GC but at Glenelg GC, where Harlequin Mistletoe *Lysiana exocarpi* was common in one section of the course, there were records of one or two birds in February-May 1995 and then in most years from 1998 to 2014. However, there have been no records since May 2014, despite regular visits. While there may have been a decline in Mistletoebirds in the area, it is also likely that the removal of some of the host trees of the mistletoe has contributed to their disappearance from the course. One or two birds were seen at Grange GC in April 1997 and April 2001, but the species was not recorded there over the next eight years (D. Carter pers. comm.). The species still visits the Greater Reedbeds area, with annual sightings from Lockleys of birds using mistletoe in an American Sweetgum *Liquidambar styraciflua* (D. Edey pers. comm.) and a record of two birds

from West Beach in June 2020 (D. Edey ebird.org).

Spotted Pardalotes were common in S. A. White's father's time but by implication less so by 1919 (White 1919a). I have only one record from Glenelg GC in November 2000 and a few records of one to two birds in May and November from Kooyonga GC between 1998 and 2015, with a breeding record from November 2000. Up to five birds were seen at Grange GC between 1996 and 2007 and they bred successfully there on several occasions, but the last record there was in April 2007 (D. Carter pers. comm.). The species is probably a vagrant to the area now.

White (1919a) indicated that Red-rumped Parrots, while once numerous and nesting in the Reedbeds, had disappeared. In fact there were a few records published by S. A. White and J. W. Mellor from Fulham and Lockleys in the early 1920s (White 1925; Mellor 1922). They were recorded twice at Grange GC in the 1960s but were not seen during a period of intensive recording from 1993 to 2009 (D. Carter pers. comm.), and are on the list of birds reported from the Royal Adelaide GC prior to 1987 but not on an updated list prepared in 2012. In over thirty years of recording birds at Adelaide Airport, at adjacent golf courses and along the Torrens River and Patawalonga Creek, I only have one record, of a single bird flying east across the River Torrens on 25 August 2018. In the absence of other records this species must be considered vagrant to the area now. It has experienced a steady decline in the parklands north and east of Adelaide and along the River Torrens near Gilberton, albeit in a slightly later period. Flocks of up to 15 birds were regularly recorded in Botanic Park from 1971 to 1974 (Paton 1976) and up to 20 were regularly recorded in open areas at Gilberton and North Adelaide through the 1980s and 1990s. Up to ten birds continued to be seen in the early 2000s with a peak of 18 at Gilberton in April 2003 and juvenile and immatures recorded in 2006, indicating breeding nearby. Numbers and recording frequency declined from

2007, until the last sighting of two pairs in North Adelaide on 13 May 2018 (pers. obs.).

While White (1919a) regarded the Red-capped Plover as common and breeding in the Reedbeds area in the early twentieth century, Whatmough (1978) only recorded a party of eight birds at the mouth of the River Torrens in the intensive survey of 1974-77. There are a few records from Adelaide Airport between 2000 and 2012, as well as records from the Patawalonga Creek between 1980 and 2012, including a breeding record in 1980. As there are no records since 2014, this species may be a vagrant to the Reedbeds area now.

Banded Lapwings were only recorded from Adelaide Airport, with small numbers present there in most months of the year from 1990 to 2000. One to two birds were seen sporadically in 2001, 2006 and 2009 and the species was last seen in February 2013.

Apart from records of resident birds in the sapphire flats near the River Torrens Outlet Channel in 1952 (Glover 1952), White-fronted Chats were recorded mainly from Adelaide Airport. Small numbers occurred there from 1990 to 1997 and then they were intermittent until the last sighting of seven birds on 17 October 2014.

Yellow-billed Spoonbills were recorded occasionally at Adelaide Airport between 1991 and 1999 and there was an isolated record on 27 November 2007 of one bird. Along the River Torrens this species was observed on only two occasions, with single birds on 20 November 2007 and 17 November 2011. The Royal Spoonbill was recorded more frequently and in larger numbers, with records at Adelaide Airport between 1993 and 1998 and again between 2012 and 2016, although the latter were mainly of one or two birds and probably the same individuals for some records. Along the River Torrens there were up to 18 birds seen at one time from 1995 to 1999, while from 2000 to 2019 the maximum number seen was seven. Both spoonbill species

have declined in numbers and frequency of observation over the last 30 years.

Straw-necked Ibis were common, especially from December to June, at Adelaide Airport in the early 1990s with a flock of up to 20 birds regularly reported. From the mid-1990s until 2007, fewer birds were recorded and they were more evenly spread throughout the year. After a four-year gap, one or two birds were again recorded there intermittently between late winter and late summer from 2011 to 2016. The River Torrens surveys also recorded a decline in this species, with 26 birds in May 1991, 15 in March 1995, 4 in February 2003, 5 in February 2004 and the last record of one individual in February 2010.

White reported a decline in the abundance of the Brown Songlark, which was a spring visitor that stayed to breed in the Reedbeds area (White 1919a). My observations of Brown Songlark in the grasslands at Adelaide Airport show that it regularly visited from 1988 to 2016, with first arrival dates in June to October. In fact, songlarks were observed in every month of the year at the airport, but the majority of records fell in the July to November period. Only one or two birds were recorded at the Airport at one time and there was a slight decline in reporting frequency after 2011. There are records from the West Beach Stormwater Basin from September 2001 and September 2018 (D. Edey pers. comm.).

Bird species that were recorded first after 1945

Table 6 lists 27 native species and five exotic species that were not recorded by S. A. White and J. W. Mellor but were recorded by me or other recent observers. The exotic species have appeared either through deliberate or accidental introduction by humans and an exploration of the appearance of the native species is presented below.

Apart from the Long-billed Corella, these native species are not common or frequently recorded

in the area and the recording of most may reflect the greater number of observers in recent times compared with a century before. This explanation may hold true for the Australasian Darter, Hooded Plover and Apostlebird. The Darter is uncommon in the Adelaide region, where there are occasional records of, particularly, single birds. Four Hooded Plover were on the Patawalonga Creek in March 1991 (Rix 1992). A group of Apostlebirds was only recorded at Royal Adelaide GC during December 1968 and January 1969 (Collison 1972; Glover 1971). There was only one record for each of Intermediate Egret, Little Egret, Square-tailed Kite, Black Kite, Oriental Plover, Pacific Golden Plover, Marsh Sandpiper, Kelp Gull, Blue-winged Parrot, Blue-faced Honeyeater and White-throated Gerygone, suggesting that these species are very rare in or vagrant to the region.

However, Little Egrets have evidently increased their range throughout Australia since 1901 (Marchant and Higgins 1990) and were not recorded in South Australia until the early 1950s (Parker *et al.* 1979). The first documented breeding of Little Egrets in the Adelaide region was in November 1984, when at least six nests with chicks and fifteen adult birds were seen in or near mangroves on a small island north of Torrens Island (Vincent and Paton 1986).

Records of the Black Falcon on the Adelaide Plains may be the result of clearance of native vegetation over much of southern South Australia. Marchant and Higgins (1993) stated that 'Clearing and establishment of pasture and crops has increased feeding habitat [for Black Falcons] in better-watered parts of range'. However, a more recent assessment of this species concluded that it is declining in the Murray-Darling Basin and is already state-listed as vulnerable in New South Wales and Victoria (Lutter and Debus 2014).

Long-billed Corellas were once restricted to the South East of South Australia (e.g. Condon 1968), but from the 1980s sightings began to

occur from the southern Fleurieu Peninsula and the Adelaide region. The Bird Report for 1982-1999 (Carpenter *et al.* 2003) noted: 'An introduced population has established in the AP [Adelaide Plains] and MLR where it often associates with the Little Corella or Galah.' This tallies with an observation in the Bird Report for 1976, which indicated that about 30 Long-billed Corellas were accidentally released in about 1975 (Reid 1980). For the years from 1991-1992, when three Long-billed Corellas were observed at the upper River Torrens, to 1999, Paton and Pedler (1999) reported the establishment of a population numbering at least 100 birds in the south-eastern suburbs of Adelaide and small numbers from all parts of suburban Adelaide. Currently large flocks of up to several hundred birds occur in the Adelaide parklands (pers. obs.). Their expansion in the Greater Reedbeds area is discussed below in the section on birds that have increased in abundance between 1988 and 2020.

The Yellow Thornbill was not recorded by White (1919a) or other early observers, which is surprising given the abundance of *Callitris* pine habitat in the old red sand dunes adjacent the Reedbeds. It is a small, inconspicuous bird easily overlooked by inexperienced observers, but its call is loud and White and Mellor were extremely competent observers. I therefore conclude that the species was not resident in the Reedbeds area in their lifetimes, although it may have been present before the largescale destruction of native pine/banksia/casuarina woodlands. Its status in the area today is uncertain; I have recorded one or two birds irregularly at Glenelg GC in 2002, 2011, 2012 and 2017, and in February 2018 three birds were seen. The species is always in the same part of the course, which is secluded and planted with native shrubs and trees, including a few Southern Cypress Pine, and the birds are often in company with Silvereyes and/or Yellow-rumped Thornbills. There is also a record of two birds in Drooping Sheoak near the Patawalonga GC on 3 October 2020 (D. Edey pers. comm.).

Table 6. Bird species first recorded for the Greater Reedbeds area after 1945.

*** introduced species**

*Mallard
*Muscovy Duck
Australian Owllet-nightjar
Brush Bronzewing
*Spotted Dove
*Barbary Dove
Oriental Plover
Pacific Golden Plover
Hooded Plover
Common Sandpiper
Common Greenshank
Marsh Sandpiper
Kelp Gull
Fairy Tern
Australasian Darter
Intermediate Egret
Little Egret
Spotted Harrier
White-bellied Sea Eagle
Square-tailed Kite
Black Kite
Black Falcon
Long-billed Corella
Blue-winged Parrot
Rock Parrot
Blue-faced Honeyeater
White-fronted Honeyeater
Yellow Thornbill
White-throated Gerygone
Apostlebird
Rose Robin
*Common Myna

The only records of Common Greenshank came from the 1974-1977 period of regular surveys along the River Torrens and were of a few birds in the Outlet Channel and adjacent swamp, mostly from October to December (Whatmough 1978). The Wood Sandpiper showed a similar occurrence in that it was reported from the Outlet Channel and adjacent swamp in the mid-1970s, with a comment that numbers had decreased from a maximum of four birds in 1974-75 and 1975-76 to two in 1976-77 and none in 1977-78 up

to December (Whatmough 1978). There were also records of Wood Sandpiper from drains along Tapleys Hill Road in February 1952, in the River Torrens Outlet Channel during February-April 1952 (Glover 1952) and from the Patawalonga Creek drain north of West Beach Road, Henley Beach, in December 2000 (D. Edey pers. comm.), and a SAMA specimen collected at Lockleys in 1960. However, this species is not included in Table 6 as there is also a SAMA specimen collected at Glenelg GC in 1938, suggesting that it was an occasional visitor to the Greater Reedbeds long before 1945.

Bird species that established in the Reedbeds in the 1920s or earlier

There are several species that arrived in the Reedbeds area during S. A. White's adulthood. White (1919a) observed that Noisy Miners had only appeared in the last six or so years, which is consistent with suggestions that they were first seen at the Reedbeds in about 1914 (Anon 1917). Mellor reported Noisy Miners breeding in 1917 at Lockleys (Mellor 1917b), with observations of two fully fledged birds being fed by adults in March of that year. Anon (1917) suggested that this species was unknown in the Adelaide district until about 1895, at which time it began extending its range over the Adelaide Plains along the foothills from the Barossa Ranges. The species was by 1917 'fairly numerous at the Reedbeds' (Anon 1917).

The aggressive nature of Noisy Miners was evident only a few years after their appearance at the Reedbeds, with Mellor (1926) noting their attacks on Common Blackbirds and an Eastern Rosella. Noisy Miners are notorious now in many urban and woodland habitats for their abundance and aggression which enables them to exclude many smaller bird species from co-existence (Debus 2008). In the MLR they are still moving south down the Fleurieu Peninsula (pers. obs.).

Two other species that colonised the Adelaide

area relatively recently were the Crested Pigeon (Black 2015) and Galah, with both species moving from more arid parts of South Australia into the more settled areas. In the early twentieth century Galahs first visited the Reedbeds in small numbers but did not stay long (White 1919a). They began nesting in the early 1920s and Mellor (1926) recorded 20 birds in August 1925, which was the largest flock he had seen to that date. The first record of Crested Pigeons from the Reedbeds was a pair seen by Mellor in his garden at Lockleys in November 1923 (Mellor 1924a). By their actions he presumed they were breeding in a nearby thicket and breeding was confirmed by the appearance of two young birds with their parents in January 1924 (Mellor 1924b).

White (1919a) recorded that Spiny-cheeked Honeyeaters visited the Reedbeds district in recent years, presumably the early twentieth century, but that they were unknown previously. In Mathews (1925-27), White said of this honeyeater, 'strange to say within the last few years it has come on to the Adelaide plains, and I have heard them calling in their wonderful way for months in the garden'. There are so few records of this species from the Reedbeds that it is likely their appearance for a few years was the result of dry conditions in their normal range and not a shift in their area of occupancy. There is only one record from the modern period, from the Royal Adelaide GC in 1990.

Bird species showing increases over the 1988-2020 period

There are a few species that have increased in abundance over the 1988-2020 period of intensive surveying by the author. These are Black Swan, Australian White Ibis, Eurasian Coot, Dusky Moorhen, Australasian Swamphen, Barbary Dove, Little Corella, Long-billed Corella and Noisy Miner. The Superb Fairywren was also more frequently recorded in the late 1990s and early 2000s and bred in the area, but then declined.

Whatmough (1978) regarded Black Swans as rare in the Outlet Channel of the River Torrens from the intensive survey of 1974-77, with only two records of a solitary bird there. Nor were they recorded in the 1991-92 survey for the River Torrens south of Henley Beach Road (Paton and Pedler 1999). For the past twenty years, a pair of swans has been regularly recorded in the Breakout Creek section of the River Torrens and/or on the Apex Park wetland. There are also breeding records for most of these twenty years in these locations, with up to five or six young produced in some years. This increase mirrors a similar increase in Black Swan numbers along the River Torrens in the city of Adelaide as well as upstream as far as Gilberton and St Peters, where a pair is frequently recorded and breeding has occurred (pers. obs.). The increase in the lower reaches of the Torrens River may reflect the improved habitat for this species due to wetland reconstruction and enhancement.

When regular surveys began at Adelaide Airport in 1988, Australian White Ibis were infrequently recorded and in low numbers. From about 1993 the frequency of recording increased and from 2005 increased again, until by 2012 the species was being seen in most censuses. The number of birds seen at one time was still small, with six or fewer being typical. Along the River Torrens small numbers of Australian White Ibis were seen infrequently in the 1990s and early 2000s, but by 2015 this species was recorded in most censuses. Numbers of birds were still small, with 16 birds being the maximum in February 2015, but typically six or fewer. This is despite the large increases in Australian White Ibis populations and the establishment of breeding colonies in the Adelaide area over the past fifteen years (Paton 2016).

Eurasian Coot, Dusky Moorhen and Australasian Swampheh were regarded by Whatmough (1978) as respectively occasional, rare and absent from the River Torrens Outlet

Channel during the 1974-1977 survey, although there were breeding records of the coot and moorhen. Likewise, Paton and Pedler (1999) found the Australasian Swampheh and Dusky Moorhen to be absent, and the Eurasian Coot rare or absent, from the two lower sections of the River in 1991-92. However, the swampheh and moorhen were common closer to Henley Beach Road, with the latter species breeding. The coot was uncommon in this reach of the River. Since that time, numbers of all three species have increased to the point where they are common from at least above Henley Beach Road to the sea and all breed regularly in this area. All three species are also common on the constructed wetlands on the golf courses and all breed on the wetlands of the Glenelg GC. Eurasian Coot were episodic at Glenelg GC from the early 1990s through to the early 2000s but, after completion of the ASR scheme in 2010, they were more frequently recorded and have bred in most years. While moorhen and swampheh numbers are relatively constant, coot numbers oscillate, with counts of up to 90 birds not unusual, especially in the section of the River Torrens downstream of Tapleys Hill Road.

A local resident believes that Barbary Doves are increasing in the Greater Reedbeds area as well as Adelaide generally and has records from Kopurlo Road at Brooklyn Park in 2014, Glen Rowan Road at Woodville South from 2017 and the corner of Esk and Fife Streets in Woodville South from December 2018 to the present (D. Edey pers. comm.).

Whatmough (1978) reported that Little Corellas were occasional at the Outlet Channel between 1974 and 1977, with a small flock visiting the banks of the river in each summer. Paton and Pedler (1999) did not record Little Corella from the lower reaches of the River Torrens in 1991-92. Records from Adelaide Airport from 1988 to 2016 show that this species was first recorded in February 1994 and from 1999 frequency of recording increased markedly. Numbers fluctuated enormously with flocks

of up to 200 being recorded in February 2010 and March 2012 but, at other times, groups of up to 20 birds were more typical. This pattern was repeated along the River Torrens and in the large eucalypts near the Lockleys Oval, where small numbers of birds, particularly in summer, appeared in about 2008. Flocks of up to 200 birds were not unusual from 2010 onwards. Little Corellas have increased markedly in the Greater Adelaide area over this same time period and to the extent that they are a major pest for some local councils, due to the noise of large flocks and the damage they inflict on infrastructure including ovals and other grassy areas.

While not increasing in such numbers as the former species, Long-billed Corellas self-introduced to the Reedbeds area, as discussed above. The species was not recorded in the 1974-1977 survey of the River Torrens in suburban Adelaide (Whatmough 1978), nor in the 1991-92 survey of the Torrens, apart from three birds in the upper Torrens valley (Paton and Pedler 1999). At Adelaide Airport they were first reported in June and July 2002 and then not again until September 2007. After this they were more regularly recorded until the end of the survey period in mid-2016. Numbers fluctuated from just a few birds to a maximum of 85 birds in March 2015. Similarly, the species occurs along the River Torrens west of Henley Beach Road, often in mixed flocks with Little Corellas. The first record was of 14 birds in February 2011 but they could have been missed in previous years in the mixed flocks of corellas. Small numbers were observed in most years after this, often with Little Corellas and usually in summer. The largest recorded numbers were 40 birds in February 2014, 34 feeding on bulbs between Tapleys Hill Road and the sea in August 2015, and 100 in eucalypts near Lockleys Oval in February 2019 in company with 100 Little Corellas.

Noisy Miners have been discussed earlier, in reference to bird species that established in

the Reedbeds area during the early twentieth century. Their numbers have increased over the last thirty years, as evidenced by the threefold increase in numbers at Kooyonga GC between 1990 and 2020. Moreover, at Grange GC there were very few Noisy Miners in 1993 when regular bird recording began but numbers have increased, possibly due to the clearance of Coastal Teatree *Leptospermum laevigatum* (D. Carter pers. comm.).

Superb Fairywrens were recorded at three golf courses between 1998 and 2005, but there was only one record at Kooyonga GC (one bird on 15 August 2002) and one bird at Grange GC (February to September 2000). The species was first recorded at Glenelg GC in May 1998 (a single bird), then a coloured male was seen twice in 1999 and once in 2000, followed by regular records of groups of birds from February 2002 till August 2005. The largest total seen on one day was 6 birds on 25 November 2002 and 19 November 2003. Evidence of breeding was found on two occasions: three juveniles accompanied a coloured male and two females on 25 November 2002 and a female was carrying nesting material on 20 September 2004. Birds were generally seen in a secluded and bushy part of the course although, after breeding in 2002, a separate group appeared to establish a couple of hundred metres away. The last record at Glenelg GC was in August 2005.

Since then, a single Superb Fairywren was at Adelaide Airport on 26 April 2016 and a few birds have been seen sporadically at Apex Park wetland since 2014. The maximum seen there was three birds (2 females and a male in eclipse plumage) on 28 February 2018. Three birds were seen there in November 2020, alleviating a concern that the major redevelopment of this site in 2018-19 may disrupt the fairywrens there. A male bird was reported on two occasions from West Beach during this time, once from Tapleys Hill Road on 3 September 2019 and once from West Beach Road on 16 September 2019 (SAOA 2020).

Escapee bird species

I have not included bird species in Table 1 that are most likely to be escapee cage birds. These are a Pale-headed Rosella *Platycercus adscitus* reported by Mellor in March 1922 (Mellor 1922) and a Major Mitchell's Cockatoo *Lophochroa leadbeateri*, also recorded by Mellor in September 1925 from Lockleys (Mellor 1926). Also excluded is an Eastern Bluebonnet *Northiella haematogaster* that was collected by S. A. White in April 1941 after his daughter Wanda saw it 'feeding on the grass seeds in the garden' (notes with the specimen, SAMA). The species had been kept in captivity for a long period and the specimen had an elongate upper mandible and long claws, making it most likely to be an aviary escapee (P. Horton, pers. comm.).

An Australian Ringneck that I observed at one of the golf courses was possibly an escapee but is included in Table 1 for reasons of completeness.

Other escapee species from the area include Superb Parrot *Polytelis swainsonii* (1 in 2008 at Lockleys), Alexandrine Parakeet *Psittacula eupatria* (1 in 2019 at Lockleys), Rose-ringed Parakeet *Psittacula krameri* (single birds at Underdale, West Beach, Henley Beach South and Lockleys from 2015 to 2020) and Rosy-faced Lovebird *Agapornis roseicollis* (1 in 1994 at Fulham) (D. Edey pers. comm.).

Introduced bird species

White (1919a) did not include introduced birds in his paper nor did he explain why he omitted them, but Mellor did report six common exotic species for the early period, namely House Sparrow, Common Starling, European Goldfinch, European Greenfinch, Eurasian Skylark and Feral Pigeon (Mellor 1919, 1920, 1924b, 1925). In addition, in passing, White did record a Common Blackbird being pursued by two Australian Magpies in May 1920, thus confirming the blackbird's presence in the Greater Reedbeds (White 1920). Four additional introduced species occur regularly in the area now: Spotted Dove,

Barbary Dove, Muscovy Duck and Mallard (which includes Khaki Campbell). Spotted Doves are abundant while the Barbary Dove was recorded by me only once, on 3 February 1999 in horse paddocks to the west of Adelaide Airport (but see other records above). Muscovy Ducks and Mallards have established wild populations on the River Torrens and on other wetlands in the district. One or two Common Mynas were recorded in the vicinity of the Adelaide Airport and Tapleys Hill Road in September and November 2011 and a single bird from Netley in December 2012 (Carpenter and Horton 2020). This introduced species is prohibited in South Australia but is occasionally reported in the Adelaide area, from deliberate introduction or accidentally through shipping or road transport.

Species richness and abundance and reasons for declines/increases

The reasons for the disappearance of so many bird species and, where the species still occur, their decline in abundance, are mainly due to wetland drainage, vegetation clearance and eventually urban infill over most of the Reedbeds in just over one hundred years. For a few individual species there were other contributing factors, for example the competitive exclusion by Noisy Miners of small bush birds but, in the long run, urbanisation may have led to the extinction or decline of those species regardless.

The numbers of species that have declined or increased do not tell the full story of the responses of avifauna to urbanisation. White and Mellor gave little indication of the numbers of individuals of each species in their bird notes and papers, but their few comments are illuminating. White (1925) described hearing the call of the Bush Stonecurlew in 1924 for the first time for a few years and noted that at one time there were up to 10 pairs nesting in one season and that the birds were plentiful. By 1924 they were no longer resident, a result that he put

down to 'population and the fox.' Likewise the Bustard, one of which appeared in June 1924, was 'often in numbers' in earlier times (White 1925). Also referring to 1924, White (1925) described the birds on his extensive swamps, listing twenty species, among them Sharp-tailed Stint [Sandpiper] 'in thousands', plentiful Australian Painted Snipe which would soon begin breeding, and Grey Teal in great numbers.

Rix (1983) painted a scene from his childhood from 1910 to 1918 of how numerous waterfowl were in the Greater Reedbeds during big flood events:

Shooting was not prevalent but when someone did fire a shot or two the effect was amazing ... I remember several occasions when this occurred and for a quarter of an hour or more, the whole of the sky over an area three to four miles long by about two miles wide, was literally filled with vast flocks of waterfowl circling, wheeling, swooping and climbing to the accompaniment of massed communication – calls blended with the sound of the rushing, whistling wings of several million birds.

Factors that White (1925, and in Mathews 1910-27) postulated had an effect on the survival of birds in the Reedbeds district were shooting, poisoning, bird catching for the aviculture trade, cats, foxes, vegetation clearance, particularly of the big timber that provided hollows, and competition for nesting hollows from the introduced Common Starling. Birds that were destroyed in large numbers included the Red Wattlebird and the Adelaide (Crimson) Rosella. White (in Mathews 1916-17) stated of the Adelaide Rosella:

These lovely parrots were once exceedingly numerous in the Mount Lofty Ranges but their ranks have been much thinned by poison and the gun: this is due to the bird being very destructive in the orchards: they are still to be found in numbers in the ranges

and many thousands are killed each year. ... They were once regular visitors to the Adelaide plains in the autumn, but they are now seldom seen.

Adelaide Rosellas are currently a common bird in the MLR, so the destruction White described may not have had a long-term effect on their population, but his mention of them regularly visiting the plains in the autumn is interesting. This regular movement is highlighted by his description of Adelaide Rosellas coming down to the plains in the autumn of 1924 and having left the Reedbeds by 26 July (White 1925). Currently Adelaide Rosellas are a common resident of the Adelaide Plains and there is no obvious seasonality to their occurrence.

Of Red Wattlebirds, White (in Mathews 1925-27) stated:

This is a widely distributed bird, but is becoming scarcer each year as they have been shot down in great numbers in the past owing to their being good eating and being troublesome at times in the orchards. From twenty to thirty years ago these birds appeared with us in the autumn on the Adelaide Plains in great numbers and their harsh note could be heard everywhere, but now an odd one or two puts in an appearance and that is all.

As with the preceding species, Red Wattlebirds have become a common resident species on the Adelaide Plains, although larger flocks move across the plains in the autumn (pers. obs.).

One species with an interesting history in the Reedbeds area is the Laughing Kookaburra. White (1919a) recorded that the species was 'numerous in the first place, then exterminated, later reintroduced; fair number about now.' He used the word 'exterminated' about this species and the Sacred Kingfisher but it is not clear whether he meant that they were persecuted or had just declined, but I suspect the latter

meaning. This is supported by a letter in the *Adelaide Observer* from 3 October 1896 in which the writer stated that kookaburras were plentiful near Adelaide fifty years prior and that their numbers had declined through the destruction of trees (<https://trove.nla.gov.au/newspaper/article/162363357>). Mellor reported the Laughing Kookaburra breeding at Lockleys in October 1917 (Mellor 1918). They are an uncommon bird in the area now, with one or two birds recorded at Kooyonga GC on a regular basis. Up to four birds (2 adults and 2 immatures bred locally) have been seen from Kooyonga GC north-east through Lockleys to the River Torrens from 2014 to the present (D. Edey pers. comm.).

Breeding species

A comparison between the two periods in terms of breeding birds is difficult to make due to incomplete records from both periods. Egg clutch data from SAMA records offer proof of breeding and White and Mellor documented breeding of some species from the earlier period, but lack of comments about breeding is not conclusive evidence for non-breeding. Likewise for the later period, breeding was noted in the course of bird surveys, but no systematic or rigorous attempts were made to document breeding.

Table 1 shows 87 breeding species in the pre-1945 period and 48 in the post-1945 period. The post-1945 list does not include a breeding record for some resident species, like Australian Pipit, suggesting that the number of breeding species is underestimated for this time period.

CONCLUSIONS

The drainage of wetlands and clearance of most of the native vegetation in the area formerly known as the Greater Reedbeds on the western Adelaide Plains has led to the extinction of many bird species and to the decline of many more. Positive influences are the creation of artificial wetlands in the Royal Adelaide and Glenelg Golf Courses, the redevelopment of the lower reaches

of the River Torrens, the retention of open areas like Adelaide Airport, the interest in planting of parks and private gardens for wildlife, and more sympathetic attitudes to the natural world. While the golf courses are predominantly managed for golfers and their sport, these open areas are planted with a variety of native and non-native plants that benefit some bird species. These factors have favoured a range of native and introduced birds and led to their colonisation or recolonisation of the area.

Other factors have also contributed to changes in the avifauna of the area, including the increase in the size of the Adelaide urban area, changes to weather patterns in South Australia and beyond, due to human-induced climate change, and ongoing native vegetation clearance in the wider region.

Notwithstanding the losses of habitat and bird species from the Greater Reedbeds, it remains the richest area for birds in the inner metropolitan Adelaide area, due mainly to the open space of Adelaide Airport, golf courses, the River Torrens and Patawalonga Creek and their associated wetlands, and the West Beach Trust land. Also important are the connections offered through the riverine systems that flow from the MLR to the coast.

The following management actions to enhance bird biodiversity are a combination of the thoughts of the author and David Edey. There is scope for attracting more bird species by the modification of existing wetlands to provide more variety of habitats, for example, gently sloping muddy and reedy banks, variations in salinity, and islands for breeding species. For some wetlands additional fringing vegetation below two metres would benefit crakes and rails and offer opportunities for breeding of terrestrial and wetland species. As it is not being used for water-based recreation, the Patawalonga Lake upstream of the boat harbour and downstream of the weir near Tapleys Hill Road is suitable for landscaping to enhance its appeal for birds.

Some low vegetation and muddy banks would complement the existing lawns and rocky banks, and shallow muddy areas in this saline environment would be attractive to some waders and terns.

The stark contrast in Noisy Miner numbers between Kooyonga and Glenelg Golf Courses is evidence of this species' attraction to park-like vegetation dominated by eucalypts. In many other ways the two courses are similar, but at Glenelg there are few eucalypt trees in the upper canopy, while at Kooyonga, eucalypts are the dominant tree. While there are other factors at play in the decline of smaller bush birds in the Greater Reedbeds over the past thirty years, the increase in Noisy Miners appears to be an important factor. Adding non-eucalyptus native trees to parks and gardens would lessen Noisy Miner dominance, as would the planting of dense low vegetation under existing trees, as this gives the smaller birds places to evade the miners. Regrettably the trend at both Kooyonga and Glenelg courses is to clear such dense low plantings in favour of links-style courses.

The area that supports the largest number and greatest richness of small bush birds is a narrow strip of habitat (50 m by 300 m) bordered by the two Westward Ho golf courses, the driving range, the Patawalonga stormwater basin and a section of the Patawalonga Creek. Found here are small resident populations of Singing Honeyeater and Yellow-rumped Thornbill and visiting Superb Fairywren, Yellow Thornbill, White-winged Triller, Grey Fantail, Golden Whistler and Horsfield's Bronze Cuckoo. With low numbers of Noisy Miners, this habitat is of low native species, including low mallee-type eucalypts and shrubs generally less than two metres tall and herbaceous plants below 30 cm in height. Such plantings in other open areas would be beneficial for a range of smaller terrestrial birds.

I hope this paper will provide a baseline so that further changes in avifauna can be measured

and reported in the future. The results show the importance of systematic and long-term data sets.

ACKNOWLEDGMENTS

David Edey gave access to his extensive database of bird sightings over thirty years and provided notes on land and water management to enhance avifaunal biodiversity. I am most grateful to him for his input, to Graham Carpenter who provided unpublished records and to David Mann who gave permission to use personal records from Kooyonga Golf Course. Derek Carter made available his detailed notes and records from Grange Golf Course from 1993 to 2009 and golfers and the administrative team at the Royal Adelaide Golf Course allowed access to their bird records from the past forty years. I am very grateful to the staff at the Kooyonga and Glenelg Golf Courses for permission to conduct bird surveys there since 1988. Likewise I acknowledge the assistance and courtesy extended to me in the conduct of bird surveys on the Adelaide Airport from 1988 to 2016. Philippa Horton of the SAMA gave access to the database of specimen records held by that institution for the Reedbeds area and improved earlier drafts of the manuscript, with many useful suggestions on style and content. As Editor she went beyond the call of duty and rigorously checked and reordered species accounts, and refined and corrected the tables. Thanks also to the three referees who made many constructive suggestions for improving drafts and directed me to additional records, and to Andrew Black in particular for his insightful comments. I am grateful to Belinda Cale for preparing Figures 1 and 4 and to Graham Carpenter for providing Figure 2.

REFERENCES

- Anon. 1917. Order Passeriformes, Family Meliphagidae, Genus Myzantha. *Myzantha melanocephala whitei* – The Noisy Minah. *South Australian Ornithologist* 3: 59-61.

- Black, A. 2015. Range expansion of the Crested Pigeon, *Ocyphaps lophotes*, in South Australia. *South Australian Ornithologist* 40: 45-61.
- Carpenter, G. and Black, A. 2015. John Gould in South Australia and a reappraisal of his type locality, 'The Belts of the Murray'. *South Australian Ornithologist* 41: 1-17.
- Carpenter, G., Black, A., Harper, D. and Horton, P. 2003. Bird Report, 1982-1999. *South Australian Ornithologist* 34: 93-151.
- Carpenter, G. and Horton, P. 2020. Bird Report, 2011-2015: Part 2, Passerines. *South Australian Ornithologist* 45: 23-36.
- Carpenter, G., Price, L. C., Bensen, C. and van Weenen, J. n.d. *Population Censuses of Yellow-tailed Black-Cockatoos in the Adelaide and Mount Lofty Ranges – Autumn 2011 and 2012*. Report prepared for the Adelaide and Mount Lofty Ranges Natural Resources Management Board.
- Collison, F. 1972. Meeting, 18.2.69. *Bird Talk* 1: 8.
- Condon, H. T. 1968. *A Handlist of the Birds of South Australia*. Second edition. SAOA.
- Debus, S. 2008. The effect of Noisy Miners on small bush birds: an unofficial cull and its outcomes. *Pacific Conservation Biology* 14: 185-190.
- DENR. 2012. *The Status of Fairy Terns in South Australia*. An unpublished report to Nature Foundation SA.
- Dolling, A. 1981. *The History of Marion on the Sturt*. Peacock Publications, Frewville, South Australia.
- Eckert, J. 2000. Birds. In *Natural History of Strathalbyn & Goolwa Districts*. Strathalbyn Naturalists Club Inc. Douglas Press, Woodville North, SA, pp. 25-86.
- Eckert, J. 2014. Arrival dates of migrant bush birds in the Strathalbyn district: a collaborative study. *South Australian Ornithologist* 39: 58-73.
- Fenner, C. and Cleland, J. B. 1935. *The Geography and Botany of the Adelaide Coast*. Rigby, Adelaide.
- Glover, B. 1952. Bird observations along the River Torrens Outlet Channel. *South Australian Naturalist* 27: 3-6.
- Glover, B. 1971. Bird Report, 1968-69. *South Australian Ornithologist* 25: 219-233.
- Glover, B. 1972. Bird Report, 1969-70 (cont.). *South Australian Ornithologist* 26: 26-33.
- Glover, B. 1973. Bird Report, 1971-72. *South Australian Ornithologist* 26: 121-125.
- Gould, J. 1865. *Handbook to the Birds of Australia*. The author, London.
- Grainger, G. 2016. Jerusalem in Fulham. *The West Torrens Historian* 8 (3): 6-7.
- Higgins, P. J. (ed.). 1999. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird*. Oxford University Press, Melbourne.
- Holmes, J. W. and Iversen, M. B. 1976. Hydrology of the Cowandilla Plains, Adelaide, before 1836. In *Natural History of the Adelaide Region*. C. R. Twidale, M. J. Tyler and B. P. Webb (eds). Royal Society of South Australia Inc., pp. 91-97.
- Horton, P., Black, A. and Blaylock, B. 2018. Ornithology at the South Australian Museum, Adelaide: 1856 to 1939. In *Contributions to the History of Australasian Ornithology. Volume 4*. W. E. Davis, H. R. Recher and W. E. Boles (eds). Memoirs of the Nuttall Ornithological Club, No. 23, Cambridge, Massachusetts, pp. 241-457.
- Horton, P., Blaylock, B. and Black, A. 2020. *Annotated List of the Birds of South Australia*. Fifth edition, Version 5.1. South Australian Museum, Adelaide. <https://www.samuseum.sa.gov.au/research/biological-sciences/birds-research>
- Kraehenbuehl, D. 1996. *Pre-European Vegetation of Adelaide: A Survey from the Gawler River to Hallett Cove*. Nature Conservation Society of South Australia Inc.,

Adelaide.

Linn, R. 1989. *Nature's Pilgrim: the Life and Journeys of Captain S. A. White, Naturalist, Author, and Conservationist*. South Australian Government Printer, Netley, South Australia.

Lutter, D. C. H. and Debus, S. J. S. 2014. Breeding behaviour and prey of Black Falcons, *Falco subniger*, including food-caching. *South Australian Ornithologist* 40: 11-30.

Marchant, S. and Higgins, P. J. (eds). 1990. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 1: Ratites to Ducks. Part B Australian Pelican to Ducks*. Oxford University Press, Melbourne.

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

Mathews, G. M. 1910-1927. *The Birds of Australia. Volumes 1-12*. Witherby & Co., London.

Mathews, G. M. 1913-14. *The Birds of Australia. Volume 3*. Witherby & Co., London. [White-necked Heron pp. 442-444.]

Mathews, G. M. 1916-17. *The Birds of Australia. Volume 6*. Witherby & Co., London. [Cockatiel pp. 239-245; Crimson Rosella pp. 304-316; Eastern Ground Parrot pp. 486-494.]

Mathews, G. M. 1918-19. *The Birds of Australia. Volume 7*. Witherby & Co., London. [Rainbow Bee-eater pp. 208-218; Spotted Nightjar (under White-throated Nightjar) pp. 221-226.]

Mathews, G. M. 1921-22. *The Birds of Australia. Volume 9*. Witherby & Co., London. [Orange Chat pp. 340-344.]

Mathews, G. M. 1925-27. *The Birds of Australia. Volume 12*. Witherby & Co., London. [Spiny-cheeked Honeyeater pp. 88-95.]

Mellor, J. W. 1917a. [Bird Notes] June 29th, 1917. *South*

Australian Ornithologist 3: 94.

Mellor, J. W. 1917b. Bird Notes. Re robins at Stirling West. *South Australian Ornithologist* 3: 81.

Mellor, J. W. 1918. [Bird Notes] October 26th, 1917. *South Australian Ornithologist* 3: 128.

Mellor, J. W. 1919. [Bird Notes] November 29th, 1918. *South Australian Ornithologist* 4: 3.

Mellor, J. W. 1920. [Bird Notes] February 28th, 1920. *South Australian Ornithologist* 5: 38.

Mellor, J. W. 1922. Bird Notes. *South Australian Ornithologist* 6: 157-158.

Mellor, J. W. 1923. Bird Notes. *South Australian Ornithologist* 7: 26.

Mellor, J. W. 1924a. Ornithological Notes. *South Australian Ornithologist* 7: 165.

Mellor, J. W. 1924b. Bird Notes. *South Australian Ornithologist* 7: 198.

Mellor, J. W. 1925. Bird Notes. *South Australian Ornithologist* 8: 130.

Mellor, J. W. 1926. Ornithological Notes. *South Australian Ornithologist* 8: 162-165.

Parker, S. A., Eckert, H. J., Ragless, G. B., Cox, J. B. and Reid, N. C. H. 1979. *An Annotated Checklist of the Birds of South Australia. Part One: Emus to Spoonbills*. South Australian Ornithological Association, Adelaide.

Parker, S. A., Eckert, H. J. and Ragless, G. B. 1985. *An Annotated Checklist of the Birds of South Australia. Part 2A: Waterfowl*. South Australian Ornithological Association, Adelaide.

Paton, D., Carpenter, G. and Sinclair, R. 1994. A second bird atlas of the Adelaide region. Part 1: Changes in the distribution of birds: 1974-75 vs 1984-85. *South Australian Ornithologist* 31: 151-193.

- Paton, J. B., Storr, R., Delroy, L. and Best, L. 1992. Patterns to the distribution and abundance of Mallards, Pacific Black Ducks and their hybrids in South Australia. *South Australian Ornithologist* 31: 103-110.
- Paton, P. A. 1976. A survey of the Adelaide Botanic Park and Gardens. *South Australian Ornithologist* 27: 131-134.
- Paton, P. A. 2016. Breeding of Australian White Ibis at St Peters, suburban Adelaide. *South Australian Ornithologist* 41: 76-79.
- Paton, P. A. and Pedler, J. A. 1999. A survey of the avifauna of the River Torrens Linear Park, Adelaide. *South Australian Ornithologist* 33: 33-46.
- Reid, J. 1980. Bird Report, 1976. *South Australian Ornithologist* 28: 127-137.
- Rix, C. 1983. Memories of the Reed Beds 1910-1930. *Bird Talk* 2: 29-37.
- Rix, C. E. 1992. An influx of birds to the Patawalonga Creek at Glenelg. *Bird Talk* 3: 75-77.
- SAOA. 2020. Bird Records. *The Birder* 253: 38.
- Sutton, J. 1936. Notes of the arrival of three migratory species. *South Australian Ornithologist* 13: 244.
- Vincent, D. J. and Paton, P. 1986. A breeding colony of Little Egrets near Torrens Island. *South Australian Ornithologist* 30: 19.
- Whatmough, R. J. 1978. Birds of the River Torrens, Adelaide. *South Australian Ornithologist* 28: 1-15.
- Whatmough, R. J. 1997. Decline of the Yellow-rumped Thornbill in an urban parkland. *South Australian Ornithologist* 32: 161-164.
- White, S. A. 1914. A sketch of the life of Samuel White – ornithologist, soldier, sailor, and explorer. *South Australian Ornithologist* 1 (3): 6-7.
- White, S. A. 1919a. Birds recorded from the early days up to the present time for the Reed Beds District. *South Australian Ornithologist* 4: 101-114.
- White, S. A. 1919b. [Bird Notes] November 29th, 1918. *South Australian Ornithologist* 4: 4.
- White, S. A. 1920. Bird Notes. *South Australian Ornithologist* 5: 87.
- White, S. A. 1925. Unusual and rare birds seen at “Wetunga” during the autumn and winter, 1924. *South Australian Ornithologist* 8: 29-31.
- <https://data.environment.sa.gov.au/Content/heritage-surveys/3-Western-Adelaide-Region-Heritage-Survey.pdf> (accessed 11 March 2018)
- <https://www.charlessturt.sa.gov.au/Witongga> (accessed 28 February 2018)
- <http://users.sa.chariot.net.au/~littoral/pat-ck/pb/pb3-2a.htm> (accessed 23 April 2020)
- <https://data.environment.sa.gov.au/Content/heritage-surveys/2-Glenelg-Heritage-Survey-Stage-1-1983.pdf> (accessed 26 April 2020)
- <https://birdssa.asn.au/location/warriparinga-wetlands-sturt> (accessed 26 April 2020)
- http://henleyandgrangehistory.org.au/?page_id=10 (accessed 11 March 2018)
- <http://www.charlessturt.sa.gov.au/FulhamParkStud> (accessed 17 March 2018)
- <https://trove.nla.gov.au/newspaper/article/162363357> (accessed 12 March 2020)

Penny Paton
47 Gilbert Street
Gilberton, SA 5081
pennypaton@adam.com.au