KANGAROO ISLAND

Glossy Black-Cockatoo 2024 Census Report

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LANDSCAPE SOUTH AUSTRALIA KANGAROO ISLAND

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ACKNOWLEDGEMENT OF COUNTRY AND SEA COUNTRY

The Kangaroo Island Landscape Board acknowledges and respects the Traditional Custodians of the Kangaroo Island region, and we also pay our respects to their Elders past, present and emerging. We acknowledge and respect the deep spiritual attachment and the relationship that Aboriginal and Torres Strait Islander people have to Country.

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The 2024 glossy black-cockatoo (GBC) population census and report were supported by the Kangaroo Island Landscape Board (KILB). Thank you to the 62 different landholders who have allowed us access to their properties and/or helped us to undertake these surveys, particularly those who were impacted by the 2019-20 bushfires. Thank you to the 39 volunteers who contributed 270 hours to the 2024 census surveys, these surveys could not have been conducted without you. In particular, thank you to Trish Mooney (Charles Darwin University) for assistance with field work. Dr Paul Rogers (KILB) provided review comments on previous versions of this report, and Josh Mulvaney who reviewed a draft version of this report.

Above: Trish Mooney (left) and Torran Welz (right) prepare to count a flock of glossy black-cockatoos. Photo credit: Sandra Leigh.

SUMMARY

- This report summarises the results of the population census for glossy black-cockatoos (GBC) (*Calyptorhynchus lathami halmaturinus*) on Kangaroo Island by staff from the Kangaroo Island Landscape Board in 2024.
- Monitoring of the population size of GBC on Kangaroo Island aligns with the regional 'Biodiversity' and 'Community' priorities outlined in the *Kangaroo Island Landscape Plan 2021-26*.
- A minimum population count of 422 GBC was recorded in 2024. This is slightly lower than counts obtained in 2020 (454), 2022 (428) and 2023 (453).
- Census surveys for glossy black-cockatoos were carried out on properties belonging to 62 different private landholders as well as public lands.
- Census surveys were carried out with assistance from 39 volunteers that contributed 270 hours of their time.
- The post-fire count data indicates the population trajectory was no longer increasing as it was pre-fire, but had stabilised.
- From a regional perspective, a decline was recorded in the population size of GBC in the fire-affected north-west region in 2024, but regional population sizes in other areas of Kangaroo Island were similar to what was recorded in 2020 immediately after the fire.
- Low numbers of fledglings were recorded in fire-affected western areas between 2022 and 2024 compared to unburnt eastern areas. This could be due to the combined effects of fewer pairs breeding and low fledgling survival in some areas.
- Raptor predation in burnt areas with reduced canopy cover continues to be the most likely explanation for lower fledgling survival.
- Priority actions to support the recovery of the GBC population on Kangaroo Island continue to be revegetation with drooping sheoak, control of nest predators and competitors, and the provision of nest boxes in key breeding areas.

INTRODUCTION

Background

The South Australian glossy black-cockatoo (*Calyptorhynchus lathami halmaturinus*; GBC) is restricted to Kangaroo Island, and is presumed extinct in its former range in the Mount Lofty Ranges and lower Fleurieu Peninsula since the 1970s (Berris *et al.* 2018). Clearance of drooping sheoak (*Allocasuarina verticillata*) feeding habitat, the primary food source of GBCs, was the likely cause of their extinction on mainland South Australia (Berris *et al.* 2018). During the early 1990s, a lack of recruitment into the adult population due to high rates of nest predation by brushtail possums (*Trichosurus vulpecula*) was causing the decline of GBC on Kangaroo Island (Garnett *et al.* 1999). Since 1995, a Recovery Program has implemented on-ground management actions to mitigate threats to the GBC on Kangaroo Island, which have included protection of nests from predators and competitors, revegetation with drooping sheoak feeding habitat and installation of nest boxes to provide additional nesting habitat. In addition to this, annual monitoring of the population size has been carried out through flock counts across Kangaroo Island during the non-breeding season to track the response of the population to management actions.

The GBC population census was initially carried out between 1995 and 2016 to track the response of the population to threat intervention measures and provided useful information on population recovery and expansion (e.g. see Berris and Barth 2020). The population census is now also providing valuable information on the effect of large-scale wildfires on the GBC population following the 2019-20 Black Summer bushfires, which burnt 54% of drooping sheoak woodlands on Kangaroo Island (Berris *et al.* 2020). It will take an estimated 15-20 years for burnt woodlands to recover and start producing the drooping sheoak seed on which GBC feed. Therefore, the GBC population is likely to have a much lower availability of feeding habitat as a result of the fires, and the population census is a valuable tool for monitoring the effect of fire and other cumulative impacts on the population trajectory of GBC. The census has been carried out 28 times over the past 32 years and provides a valuable long-term dataset that is maintained by the Kangaroo Island Landscape Board.

Objectives

The objectives of the 2024 census were to:

- determine flock sizes in all occupied GBC flock regions and estimate the minimum population size on Kangaroo Island;
- determine the number of juvenile GBC from the most recent breeding season in each of the flocks to estimate breeding productivity and fledgling survival in different areas;
- provide further information on the long-term effects of the 2019-20 bushfires on flock sizes and breeding productivity of the GBC population.

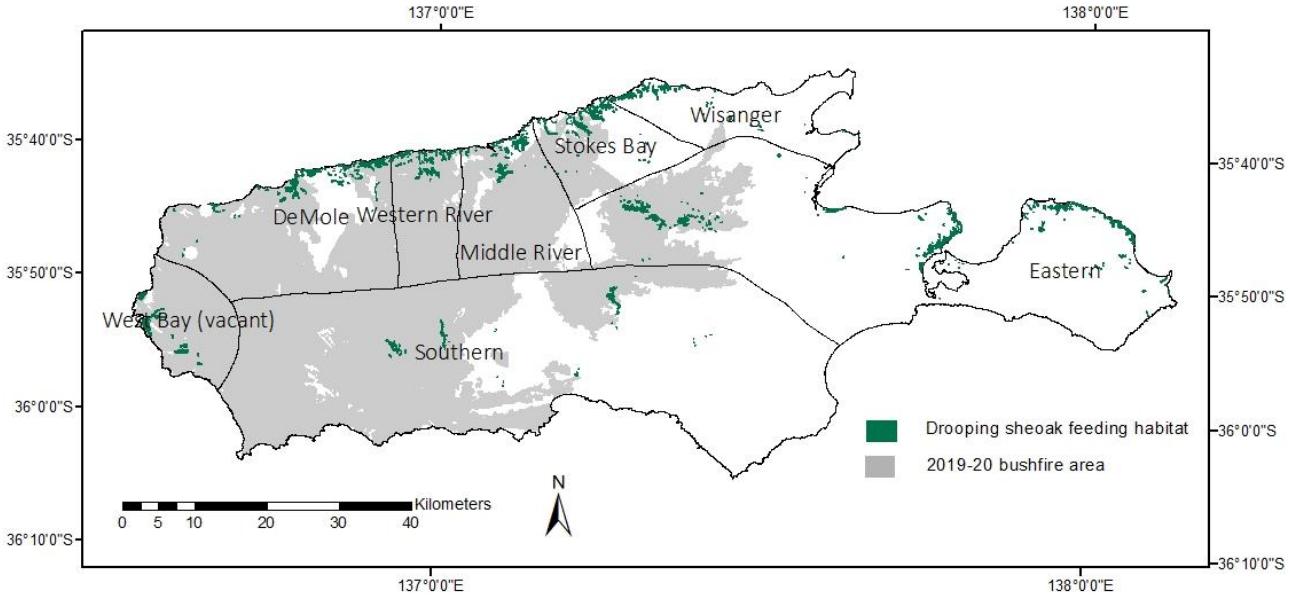

Figure 1. Map of flock regions on Kangaroo Island, as defined by Mooney and Pedler (2005), with the Eastern flock region expanded to include all of the Dudley Peninsula reflecting recent range expansion of GBCs in this flock. Green represents mapped areas of woodland dominated by drooping sheoak, and light grey represents the 2019-20 bushfire burn area.

METHODS

Population count for Kangaroo Island

Between 9 September and 27 September 2024, drooping sheoak foraging habitat on Kangaroo Island was surveyed by KILB staff for evidence of feeding by GBC. All unburnt foraging habitat in the De Mole, Western River, Middle River, Stokes Bay and Southern flock areas was checked by staff, volunteers or landholders. Some foraging habitat in the Wisanger and Eastern (Dudley Peninsula) flock regions was not searched due to time constraints and landholders familiar with glossy black-cockatoos indicated there was no evidence during the year of those areas being used. Recent feeding activity included fresh 'chewings', recognisable by their cream and green colouration, or sightings of feeding GBC were recorded. When GBC were located, the number of birds, gender and age class of individuals were recorded where possible. Once the main feeding areas in a flock region (Fig. 1) were located, staff revisited known feeding sites in the evening, and counted flocks with the assistance of volunteers as they moved out of feeding habitat to roost sites.

Staff and volunteers surveyed all flocks systematically from west to east across the island to reduce the chances of GBC moving between flocks and being double counted. In the De Mole River, Western River, Middle River, American River and Dudley Peninsula areas, searching and counts were carried out over two days and two nights to enable double counts and provide more time for searching habitat in these areas. During the survey counts, staff and volunteers were positioned in locations that enabled accurate counts of flocks as they flew to roost sites in the evenings. Surveys started at approximately 16:00 each afternoon and finished at dark. GBC were most active between 17:00 and 18:30, when they flew up to large *Eucalyptus* trees to roost.

For the purpose of this census, juvenile GBCs were defined as those <1 year old and from the current breeding season (i.e. still dependent on their parents). Juveniles were identified within the flock by their distinctive begging calls, behaviour (i.e. close to parents, begging, not feeding completely independently) and plumage. Immature GBCs were independent birds that had not yet developed adult plumage and were approximately 1-4 years of age. Binoculars and digital cameras with high zoom capabilities were used to identify birds to gender and check for the presence of a leg band. Juveniles with leg bands were known to be from monitored nests and attempts were made to identify individual banded adults and juveniles. Dates and locations of flock counts (where birds were present) during census week are shown in Table 1. Data obtained during the 2024 census were compared to long-term census data collected by the Recovery Program since 1995. Changes in total population counts, flock counts in different areas and the proportion of adults, immature and juvenile birds were compared over the years.

Table 1. Dates and areas where glossy black-cockatoos were located during the 2024 census survey.

Date	Flock region	Locations of flocks
9 & 10 September	De Mole River	Snug Cove Kangaroo Gully
11 & 12 September	Western River	Inchant Gully Middle River Coast
13 September	Southern	Murray Lagoon, Eleanor River
16 & 17 September	Middle River	Lower King George Creek area, Middle River Mouth, Middle River Gorge
18 September	Stokes Bay	Deep Gully, Gum Gully
19 September	Wisanger	Rose Cottage Road, Dashwood Bay
23 September	Eastern A - Cygnet River	Cygnet Park
24 September	Eastern A – Nepean Bay	Revegetation on Min-Oil Road
25 September	Eastern A - American River	Ballast Head to township, Muston Gully
26 & 27 September	Eastern B – Dudley Peninsula	Penneshaw township

RESULTS

Population count for Kangaroo Island

A minimum population count of 422 GBC was recorded during census surveys in 2024. This count was similar to the count recorded in 2022, but lower than the 2020 and 2023 counts (Fig. 2, Table 2). The population consisted of 16 main flocks and three trios located away from the main flocks. Flock size varied between 8 and 107 individuals. The five-year moving-average trend line has stabilised post-fire, compared to a generally increasing population trend pre-fire (Fig. 2).

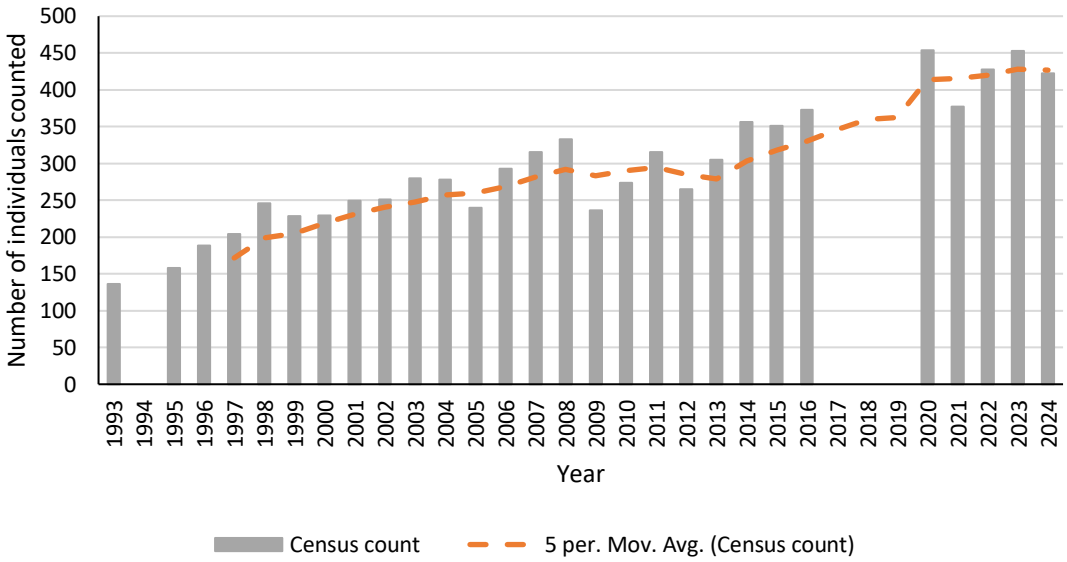

Figure 2. Census count totals between 1993 and 2024, with a five-year moving average (orange dashed line). Census counts were not carried out in 1994 and between 2017 and 2019.

Flock region counts

Much of the changes in flock sizes observed in Table 2 (i.e. lower Middle River flock size but higher Stokes Bay flock size) can be explained by the movements of individuals between adjacent flock areas on a seasonal or annual basis, which has been confirmed through band resighting data. Therefore the island was divided into three larger geographical regions, where flocks that record regular inter-flock movements of banded birds were grouped together. This enabled some broader trends to be identified (Fig. 3). There has been a slight decrease in the population size along the fire-affected north-west coast of Kangaroo Island since 2020. However, the overall population counts recorded along the mid-north coast and in the connected southern and eastern areas are remarkably similar to the 2020 count. Changes in the flock sizes between years in the Cygnet River, Southern regions, American River and Dudley Peninsula is likely due to large movement between all of these areas between years. In 2024 we detected multiple individuals in the southern region during the census period, which were recorded on the eastern Dudley Peninsula in other years. Therefore, our band resighting records are increasingly indicating the southern, Cygnet River, American River and Dudley Peninsula flocks are very interlinked with regular movement between them.

Table 2. Census counts of flock size in different flock regions from 2012 to 2024. For flock sizes prior to 2012, see Barth and Morgan (2013). Numbers highlighted in red recorded >20% fewer individuals than in 2020, and numbers highlighted in green recorded >20% more individuals than in 2020. Eastern A = American River and Cygnet River. Eastern B = Dudley Peninsula.

Area	**2012**	**2013**	**2014**	**2015**	**2016**	**2020**	**2021**	**2022**	**2023**	**2024**
De Mole	*59*	*51*	*72*	*69*	*51*	*100*	*81*	*99*	*104*	*107*
Western River	*60*	*57*	*71*	*57*	*55*	*78*	*29*	*55*	*65*	*34*
North-west Region Totals	**119**	**108**	**143**	**126**	**106**	**178**	**110**	**154**	**169**	**141**
Middle River	*51*	*53*	*60*	*64*	*56*	*63*	*52*	*47*	*73*	*55*
Stokes Bay	*20*	*38*	*43*	*39*	*48*	*70*	*47*	*60*	*37*	*52*
Wisanger	*-*	*18*	*14*	*15*	*20*	*5*	*22*	*21*	*26*	*31*
Mid-north Coast Region Totals	**71**	**109**	**117**	**118**	**124**	**138**	**121**	**128**	**136**	**138**
South Region	**23**	**45**	**37**	**33**	**41**	**16**	**34**	**26**	**21**	**28**
Cygnet Region	**10**	**0**	**4**			**28**	**35**	**39**	**21**	**27**
American River	*25*	*32*	*31*	*39*	*66*	*49*	*46*	*43*	*60*	*58*
Dudley Peninsula	*17*	*11*	*24*	*35*	*36*	*45*	*31*	*38*	*46*	*28*
East Region Totals	**42**	**43**	**55**			**94**	**77**	**81**	**106**	**86**

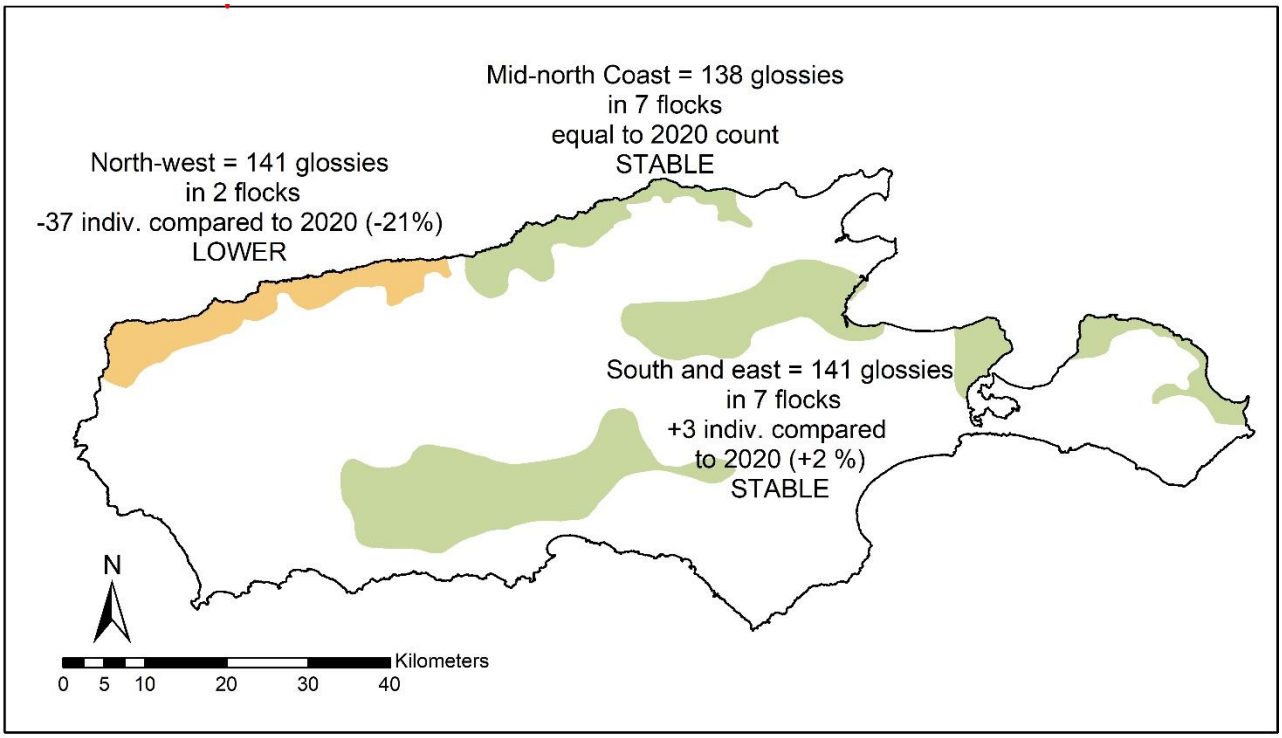

Figure 3. Regional changes in the GBC population size in broader geographical regions of Kangaroo Island between 2020 and 2024.

Population composition

In 2024, 282 GBCs (67%) were identified to gender and/or age class during the census. Flock composition by region is shown in Table 3. Based on the individuals identified to gender, the ratio of adult male to adult female GBCs was 1.5: 1, which is similar to the long-term average of 1.45: 1 (Fig. 4). Large numbers of unpaired males where once again sighted in the De Mole River area in 2024, and smaller numbers also in Stokes Bay, Nepean Bay and American River, Middle River and Dudley Peninsula areas. During the 2024 census week, 33 juvenile GBCs from the most recent breeding season were counted. The proportion of adult GBCs in the population (based on the 282 identified) was 80%, and the proportion of immature and juvenile GBC was 20% which is similar to proportions recorded in 2023. The proportion of females across the island with a dependent juvenile was 36.7 %, which was close to the long-term average (38.5 % ± 8) (Fig. 5).

Of the 107 GBCs in the De Mole River area, seven fledglings were identified in 2024, compared to only one during the 2023 census counts. Stokes Bay once again recorded low numbers of fledglings at census time compared to the known number of nestlings that successfully fledged from nests in the area. Fourteen GBC nestlings were confirmed to have fledged from the area during the breeding season, however during the census only four pairs in the area still had a fledgling with them.

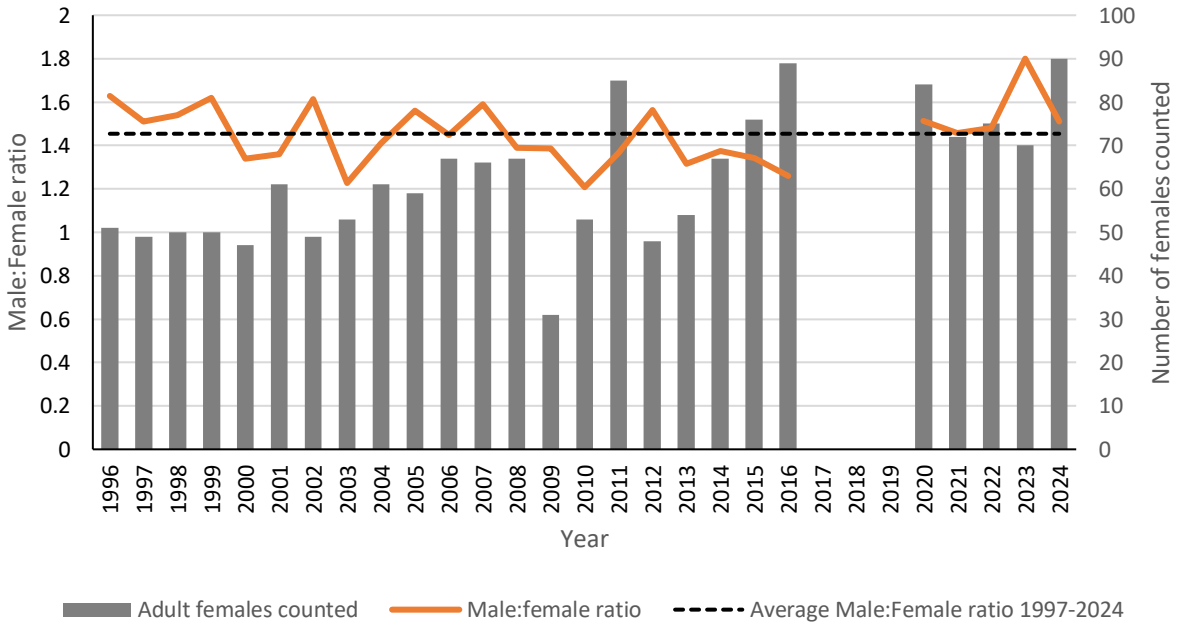

Figure 4. The male: female ratio, average sex ration between 1997 and 2024 and the total number of females recorded in census counts between 1996 and 2024. Census counts were not carried out between 2017 and 2019.

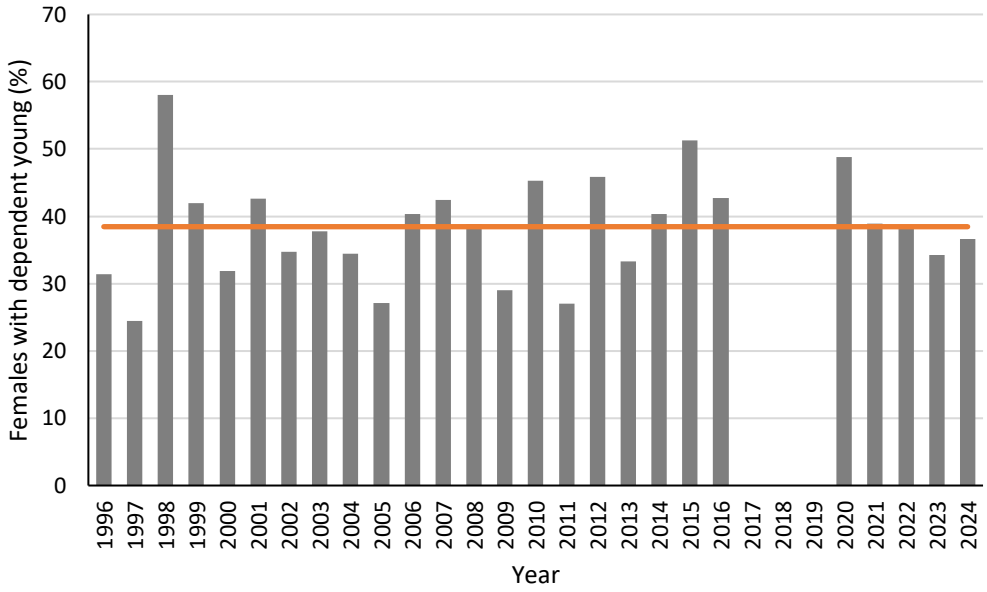

Figure 5. The percentage of adult females with a dependent juvenile from the most recent breeding season during the census counts between 1996 and 2024. Census counts were not carried out between 2017 and 2019. Orange line indicates average over all years.

Data on the occurrence of juvenile GBCs was then split in to two categories; 1) areas that experienced high fire impacts (West: De Mole River, Western River, Middle River, and Southern flock regions) and 2) areas that experienced no or lower fire impacts (East: Stokes Bay, Wisanger and Eastern flock regions). The proportion of the total count that were identified as juveniles was 9.6 % in areas that had minimal fire impacts, and was 6.3 % in areas significantly impacted by fire. In the eastern areas with minimal fire impacts, 50 % of females identified during the census had dependent young with them. In western areas that were more heavily fire impacted, only 27% of females had dependent young (Fig. 7).

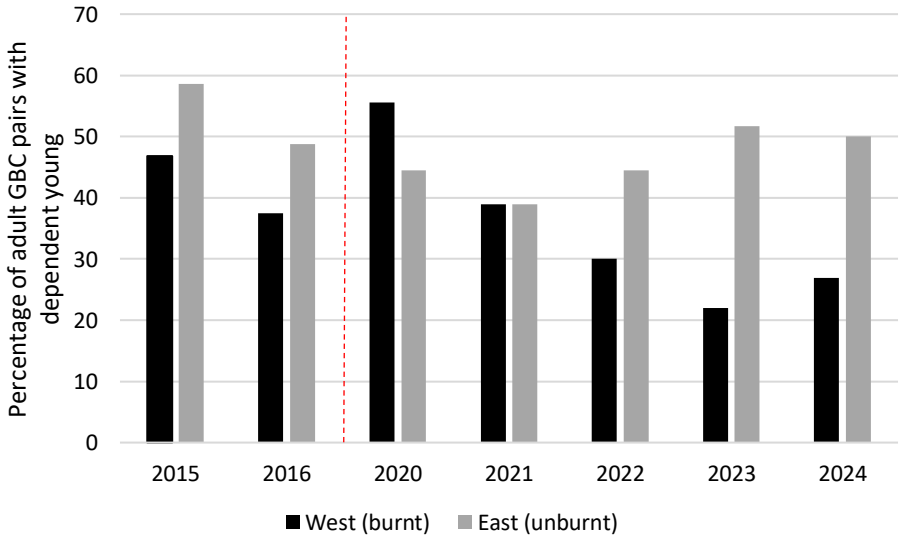

Figure 6. The percentage of adult pairs that had dependent young during 2015 and 2016 (pre-fire) and 2020-2024 (post-fire) in burnt western areas and unburnt eastern areas. Red line separates pre-fire and post-fire data.

Table 3. The number of glossy black-cockatoos counted in each flock region during the 2024 census counts. The number identified to gender and/or age class at each location is provided.

Flock region	Location	Adult		Immature		Juvenile			Unknown Sex / Age	Total
		M	F	M	F	M	F	Unknown		
De Mole	Snug Cove	26	15	4		1	2	3	53	104
	Kangaroo Gully	1	1			1				3
Western River	Upstream from Pebbly Beach	18	14	2						34
Middle River	Middle River Gorge	8	5	1	1				2	17
	Middle River Mouth area	9	7		1			3	6	26
	King George Creek area	4	4				1		3	12
Stokes Bay	Deep Gully	15	8	1	1			3	23	51
	Gum Gully	1	1					1		3
Wisanger	Dashwood Bay	5	4	2		1			4	16
	Rose Cottage Road	4	3	2			1		5	15
Southern	Murray Lagoon	3	3					2	12	20
	Eleanor River	4	3			1				8
Eastern	Cygnet Park	8	5			1		3	10	27
	Nepean Bay	5		4						9
	American River - township	8	7	2		2	1			20
	Muston Gully	10	5				1	2	11	29
Dudley Peninsula	Penneshaw	7	5	2		1	1	1	11	28
	Totals	**136**	**90**	**20**	**3**	**8**	**7**	**18**	**140**	**422**

Landholder Engagement

During the census surveys, 62 separate landholders were contacted and either allowed us access to GBC habitat on their property to undertake surveys or assisted us with surveys by surveying their property and providing us with the results of their surveys. In addition to this, surveys were also carried out in five different Conservation Parks or Wilderness Protection Areas within the Department for Environment and Water reserve network.

Community Engagement

The census surveys were conducted with assistance from 39 volunteers, who contributed 270 hours of their time to the surveys. Kangaroo Island Landscape Board employees represented 26 % of the total number of volunteers that assisted. A further 26 % of the volunteers worked at either Raptor Domain/Kangaroo Island Wildlife Park, Department for Environment and Water or Birdlife. Of the volunteers that assisted in 2024, 76 % were returning volunteers that had assisted with the census in previous years.

DISCUSSION

The 2024 GBC population census recorded 422 individuals. This count was lower than three of the four other post-fire population counts. Our results between 2020 and 2024 indicate that the GBC population on Kangaroo Island has stabilised post-fire, and this most recent count provides further evidence that the increasing population trend recorded pre-fire has ceased. At a regional level, the population of GBC along the fire-affected north-west coast contributed to most of the decline observed during this most recent count. Consistent with previous years, most patches of drooping sheoak feeding habitat in western fire-affected regions had evidence of GBC feeding activity, whereas on the unburnt Dudley Peninsula there were large patches of drooping sheoak that showed no evidence of any recent feeding. As well as obtaining important data on population trajectory, the census surveys are supported by large numbers of landholders and community volunteers. More than 100 individuals were engaged with during the three weeks of surveys, and all received feedback on the results of the census surveys after their conclusion.

Re-sightings of banded GBC during and after the census indicated that several banded birds usually recorded on the Dudley Peninsula were feeding in the southern area of Kangaroo Island (Eleanor River and Murray's Lagoon) during the 2024 census. Staff have known for some time that there is regular movement between the Cygnet River and Southern flocks, and further movement between the Cygnet River, American River and Dudley Peninsula flocks. However, this year was the first time we have recorded movement of larger numbers of birds from the Dudley Peninsula directly to the Southern flock. These additional band records indicate that flocks that occupy the southern and eastern parts of Kangaroo Island are very interconnected, and when flock counts from these areas were combined, the total population size estimates were stable across this geographic region since 2020 (Fig. 3). The only broader region to record fewer birds was in the far north-west of the island, where the most significant fire impacts occurred.

The proportion of adult GBC pairs that had a juvenile from the most recent breeding season accompanying them was low in western fire-affected flocks (27%) compared to the eastern flocks in unburnt areas (50%). This was also recorded in the 2022 and 2023 census surveys. Nesting success of monitored nests in fire-affected regions has remained high in post-fire years, however the number of active nests that are being located by staff each breeding season is consistently lower post-fire compared to pre-fire. It is likely that low fledgling survival is contributing to this decline in some areas. In 2023, a landholder in the Stokes Bay area witnessed a wedge-tailed eagle predation event on a GBC several weeks prior to the census. Staff also noted that same year that the call of a GBC nestling attracted wedge-tailed eagles to fly in low over the nestling. Over the past 12 months, staff have also frequently observed flocks of GBC interrupt feeding when circled by wedge-tailed eagles, sometimes they flock up and fly at circling wedge-tailed eagles, and in other instances they have flown away from the feeding area, indicating that predation by this species represents a threat. Dietary studies from other areas of southern Australia have recorded other cockatoo species (sulphur-crested cockatoos, galahs and corellas) as prey items of wedge-tailed eagles (Fulton 2019; Olsen *et al.* 2019; Debus *et al.* 2021). Predation of other black-cockatoo species by wedge-tailed eagles has also been documented, including red-tailed black cockatoos and Carnaby's cockatoos (Saunders and Dawson 2018; Saunders 2023). Therefore, it is plausible that wedge-tailed eagle predation contributes to GBC fledgling mortality, especially as fledglings

are relatively conspicuous given their loud begging calls. It may be that predation risk has been exacerbated in fire-affected areas of Kangaroo Island due to the lack of continuous forest canopy post-fire along the north coast of the island.

NEXT STEPS AND FUTURE PRIORITIES

GBC are continuing to persist in all flock regions post-fire. However, threats for the Kangaroo Island population identified through census surveys include flocks of GBCs restricted to small unburnt patches of drooping sheoak in fire-impacted areas, and a lower survival and prevalence of fledglings from the most recent breeding season in fire-impacted areas. There was evidence of current or recent feeding activity in most revegetated drooping sheoak patches surveyed during the census, providing further evidence of the habitat value of past, present and future revegetation programs to this population.

The priority management actions for the Kangaroo Island GBC population remain largely unchanged from previous reports, and include:

- Revegetation of drooping sheoak in areas where low amounts of available foraging habitat are present. Well-spaced revegetation (4-6 metres between seedlings) is likely to produce seed faster than natural fire regeneration.
- Protection of nests from predators and competitors in all occupied flock regions and provision of nest boxes in strategic locations where required.
- Drooping sheoak revegetation in areas further afield from current feeding areas, to create 'stepping stones' between existing foraging habitat, and act as insurance habitat in the event of further widespread bushfire events. Examples of this include the drooping sheoak revegetation at Murray Lagoon and North Cape.
- Protection of unburnt sheoak patches on the western half of Kangaroo Island from fire.
- Further research on the feeding behaviour of GBCs in areas with low food availability compared to eastern unburnt areas.
- Further research on the low fledgling numbers and low post-fledging survival in some flock areas.
- Continuation of census surveys to determine the long-term impact of reduced food availability on the Kangaroo Island population.

MEDIA SUMMARY

The Kangaroo Island glossy black-cockatoo (GBC) feeds only on unripe drooping sheoak seeds, a trait that makes the subspecies especially vulnerable to habitat loss. The 2024 Kangaroo Island glossy black-cockatoo population census recorded 422 individuals and indicates the population trend of this subspecies is no longer increasing but remains stable following the 2019-20 Black Summer bushfires. Census surveys were carried out with assistance from 62 different private landholders as well as on public land, and were undertaken with 39 volunteers that contributed 270 hours to the surveys. A regional decline was recorded in the fire-affected north-west region of Kangaroo Island, whereas other regions have remained stable over time. Proportionally fewer adult

GBC pairs had juveniles from the most recent breeding season accompanying them in western fire-affected areas compared to eastern unburnt areas. Fewer pairs breeding per annum as well as loss of canopy cover post-fire possibly contributing to increased raptor predation, could be explanations for this. The Kangaroo Island glossy black-cockatoo population is at risk of further decline due to low food availability in the wake of the 2019-20 bushfires, lower availability of natural tree hollows in burnt areas and increasing competition for hollows. Widespread revegetation with drooping sheoak trees, management of nest predators and competitors and the continuation of the nest box program is recommended to increase the long-term security of this population. It is also recommended unburnt sheoak patches on western Kangaroo Island are protected from fire until burnt habitat returns to seed production.

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Above: From left; Torran Welz, Karleah Berris and Trish Mooney undertaking census surveys in less-than-ideal weather conditions. Photo credit: Sandra Leigh.