



Kangaroo Management Program 2023 annual report

For the Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South
Wales 2022–26

Department of Climate Change,
Energy, the Environment and Water



Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

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Introduction

The NSW Department of Climate Change, Energy, the Environment and Water (the department) and its predecessor organisations have been researching, monitoring and managing the commercial harvesting of kangaroos in New South Wales since the 1970s. During this period, kangaroo management plans have provided the framework for harvesting kangaroos, in accordance with legislative requirements and population variations.

In December 2021, the Australian Government declared the Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South Wales 2022–26 to be an approved wildlife trade management plan for the purposes of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. This plan sets the framework for the commercial harvest of kangaroos in New South Wales.

This report gives details of the operation of the Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South Wales 2022–26 in its second year (2023), as required by *Action 7.1: Produce and publish regular reports* of the plan. Appendix A describes each performance indicator and the progress made against it during 2023.

The following information is presented:

- actual harvest, by zone and species, compared with the approved quotas
- details of any special quota used (see **Special quota** below for an explanation of special quotas)
- harvest gender bias for each species in each zone
- average carcass weights for each species in each zone
- compliance statistics
- number of licensees
- number of premises inspected
- number of penalty infringement notices issued and the reasons
- number of prosecutions undertaken (offence and outcome)
- any joint surveillance or enforcement activities completed
- any unusual situations that arose (for example, flood, disease outbreaks, market factors)
- any experiments or research undertaken by the department or sponsored by the department.

Details of population survey methods, the results of aerial surveys and the setting of quotas are given in a separate report, the *2023 Quota Report*, available from the *Kangaroo management plans, reports and research* webpage.

Commercial harvest by zone and species

The 2023 harvest was 509,671 kangaroos for all species across all management zones. This represents 4.3% of the population and 27.5% of the quota. The harvest for 2023 for each management zone is summarised in Table 1.

Data includes management zone number and name, combined population estimate (p), combined quota per zone (q), quantity harvested (harvest), the commercial harvest as a percentage of the population estimate (% p), the commercial harvest as a percentage of the approved quota (% q), the percentage of harvested animals that were males (% harvest male) and the average carcass weight in kilograms (Av. wt) of harvested males (M) and females (F).

The 2023 commercial harvest was higher than that reported for the previous year, in both absolute terms and as a percentage of quota. The total number of kangaroos harvested in 2022 was 402,719, representing 3.7% of the population and 23.8% of the 2022 quota.

The increased harvest in 2023 is attributed to improved access to properties, despite heavy rainfall in some parts of the state. High rainfall and flooding were highly variable across New South Wales, with some areas being inundated early in the year and others receiving very low rainfall throughout the year.

Demand for kangaroos was also variable throughout the year, with a range of factors affecting the kangaroo meat industry – limited cold storage space, high cost of energy (impacting processing costs), high cost of fuel (impacting transport costs), and reduced export demand.

Table 1 Harvest during 2023 by zone for all species combined

Zone	Population (p)	Quota (q)	Harvest	% p	% q	% harvest male	Av. wt. (M)*	Av. wt. (F)*
01 – Tibooburra	360,860	60,191	11,676	3.2	19.4	83.9	28.3	17.7
02 – Broken Hill	1,958,002	328,624	74,736	3.8	22.7	85.4	27.6	18.6
04 – Lower Darling	1,007,984	164,540	37,605	3.7	22.9	84.6	28.6	19.5
06 – Cobar	223,473	37,185	9,172	4.1	24.7	91.0	27.4	17.8
07 – Bourke	244,754	39,482	11,798	4.8	29.9	91.2	27.0	18.0
08 – Narrabri	635,120	87,395	27,296	4.3	31.2	83.6	29.0	18.4
09 – Armidale	582,712	87,407	39,579	6.8	45.3	84.6	29.6	19.2
10 – Coonabarabran	1,240,233	189,982	67,810	5.5	35.7	87.6	28.4	18.2
13 – Glen Innes	555,844	83,377	16,786	3.0	20.1	86.6	29.1	18.8
14 – Upper Hunter	373,630	56,044	25,968	7.0	46.3	87.4	30.6	19.7
16 – South East NSW	1,428,800	214,320	30,519	2.1	14.2	73.4	32.0	19.8
17 – Griffith North	1,140,527	175,068	62,954	5.5	36.0	75.6	29.2	19.2
18 – Griffith South	867,554	136,771	50,972	5.9	37.3	80.9	28.7	20.2
48 – C/T North	777,350	116,602	23,461	3.0	20.1	81.6	30.6	19.3
49 – C/T South	488,270	73,240	19,339	4.0	26.4	83.9	31.4	20.4
Total	11,885,113	1,850,228	509,671	4.3	27.5	83.2	29.0	19.2

C/T: Central Tablelands

*Average weights are in kilograms.

The harvest data in Table 1 are shown graphically in Figure 1 to illustrate the absolute and relative contributions to the total harvest made by each commercial kangaroo management zone in 2023. This shows the Broken Hill zone contributed the highest number of kangaroos, with 14.7% of the total harvest. It also shows low numbers of kangaroos harvested in Bourke, Tibooburra and Cobar zones.

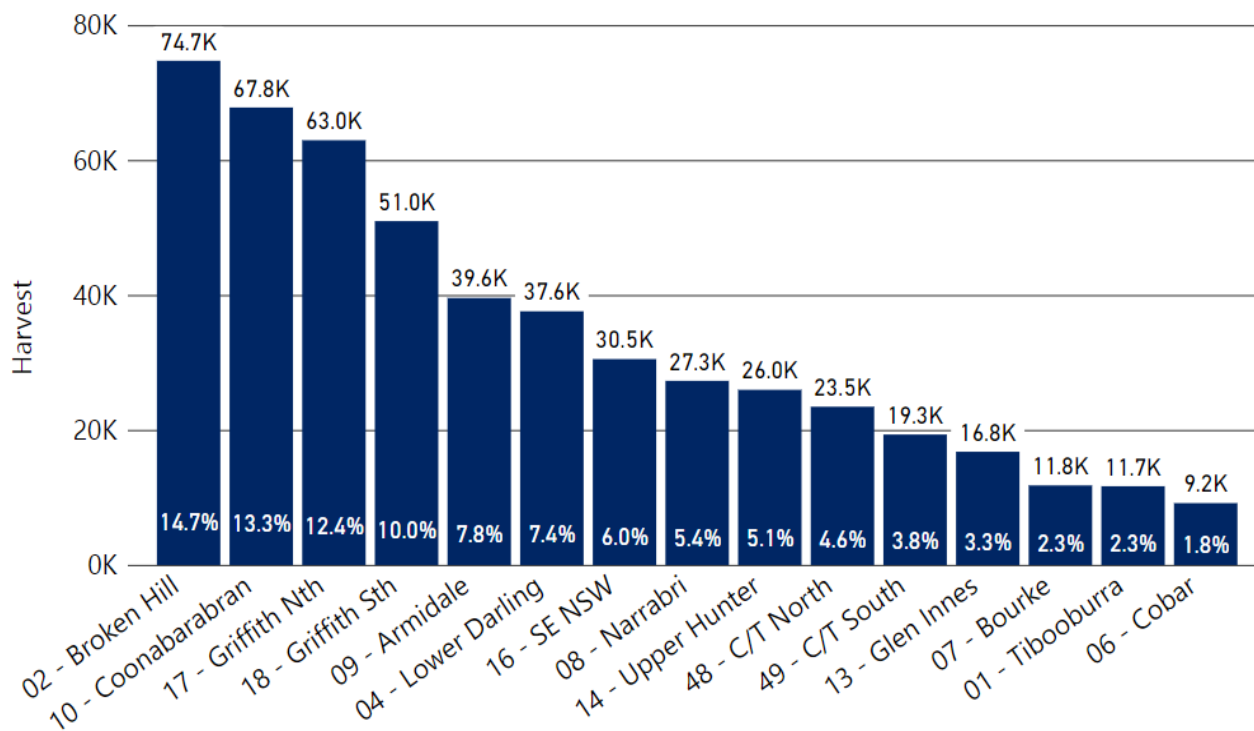


Figure 1 Total harvest and percentage contribution to the 2023 harvest for each zone

Table 2 lists the details of the 2023 harvest by zone and species. Data includes the management zone number and name, population estimate (p), quota per zone (q), quantity harvested (harvest), the commercial harvest as a percentage of the population estimate (% p), the commercial harvest as a percentage of the approved quota (% q), the percentage of harvested animals that were males (% harvest male) and the average carcass weight in kilograms (Av. wt) of harvested males (M) and females (F).

Table 2 Harvest during 2023 by zone and species

Zone	Population (p)	Quota (q)	Harvest	% p	% q	% harvest male	Av. wt (M)	Av. wt (F)
Eastern grey								
01 – Tibooburra	13,208	1,321	4	0.0	0.3	100.0	33.8	0.0
02 – Broken Hill	88,970	13,346	1,670	1.9	12.5	75.8	28.5	19.5
04 – Lower Darling	105,674	15,851	11,233	10.6	70.9	81.1	30.3	21.4
06 – Cobar	16,917	2,538	1,995	11.8	78.6	91.1	26.9	17.7
07 – Bourke	18,839	1,884	777	4.1	41.2	94.5	27.4	18.3
08 – Narrabri	286,900	28,690	19,214	6.7	67.0	83.2	28.6	18.5
09 – Armidale	446,700	67,005	35,059	7.8	52.3	82.8	29.7	19.2
10 – Coonabarabran	969,876	145,481	52,335	5.4	36.0	87.5	28.2	18.1
13 – Glen Innes	439,220	65,883	14,979	3.4	22.7	84.9	29.4	18.8
14 – Upper Hunter	260,650	39,098	20,110	7.7	51.4	83.8	31.1	19.7
16 – South East NSW	1,428,800	214,320	30,519	2.1	14.2	73.4	32.0	19.8
17 – Griffith North	781,089	117,163	36,459	4.7	31.1	75.2	29.5	19.4
18 – Griffith South	444,598	66,690	36,342	8.2	54.5	79.1	29.0	20.6
48 – C/T North	777,350	116,602	23,461	3.0	20.1	81.6	30.6	19.3
49 – C/T South	488,270	73,240	19,339	4.0	26.4	83.9	31.4	20.4
Eastern grey total	6,567,061	969,112	303,496	4.6	31.3	81.4	29.7	19.5
Red								
01 – Tibooburra	344,350	58,540	11,645	3.4	19.9	83.9	28.3	17.7

Zone	Population (p)	Quota (q)	Harvest	% p	% q	% harvest male	Av. wt (M)	Av. wt (F)
02 – Broken Hill	1,746,169	296,849	64,496	3.7	21.7	86.5	27.5	18.4
04 – Lower Darling	667,100	113,407	19,796	3.0	17.5	85.7	28.3	18.5
06 – Cobar	183,195	31,143	5,299	2.9	17.0	91.3	28.0	18.0
07 – Bourke	214,369	36,443	10,941	5.1	30.0	91.0	26.9	18.0
08 – Narrabri	345,322	58,705	8,082	2.3	13.8	84.7	29.8	18.2
10 – Coonabarabran	197,356	33,551	15,302	7.8	45.6	87.8	29.3	18.4
17 – Griffith North	199,456	33,907	21,782	10.9	64.2	75.3	28.9	18.9
18 – Griffith South	331,894	56,422	14,208	4.3	25.2	85.6	27.9	18.8
Red total	4,229,211	718,967	171,551	4.1	23.9	85.2	28.1	18.5
Walleroo								
09 – Armidale	136,012	20,402	4,520	3.3	22.2	99.2	28.5	25.2
13 – Glen Innes	116,624	17,494	1,807	1.5	10.3	99.9	27.2	15.0
14 – Upper Hunter	112,980	16,946	5,858	5.2	34.6	99.7	29.2	29.9
Walleroo total	365,616	54,842	12,185	3.3	22.2	99.6	28.7	26.4
Western grey								
01 – Tibooburra	3,302	330	27	0.8	8.2	70.4	26.2	19.5
02 – Broken Hill	122,863	18,429	8,570	7.0	46.5	79.0	27.7	18.9
04 – Lower Darling	235,210	35,282	6,576	2.8	18.6	87.1	26.7	18.6
06 – Cobar	23,361	3,504	1,878	8.0	53.6	90.2	26.1	17.4
07 – Bourke	11,546	1,155	80	0.7	6.9	92.5	26.6	18.8

Zone	Population (p)	Quota (q)	Harvest	% p	% q	% harvest male	Av. wt (M)	Av. wt (F)
08 – Narrabri	2,898	0	0	0.0	0.0	0.0	0.0	0.0
10 – Coonabarabran	73,001	10,950	173	0.2	1.6	88.4	24.3	16.5
17 – Griffith North	159,982	23,998	4,713	2.9	19.6	80.4	28.7	19.0
18 – Griffith South	91,062	13,659	422	0.5	3.1	77.0	27.6	20.2
Western grey total	723,225	107,307	22,439	3.1	20.9	82.7	27.4	18.8
Total all species	11,885,113	1,850,228	509,671	4.3	27.5	83.2	29.0	19.2

C/T: Central Tablelands

Figure 2 shows the proportion of the total harvest made up of each species. It illustrates that 60% of the kangaroos harvested in 2023 were eastern greys. Wallaroos contributed just 2% of the total harvest in 2023.

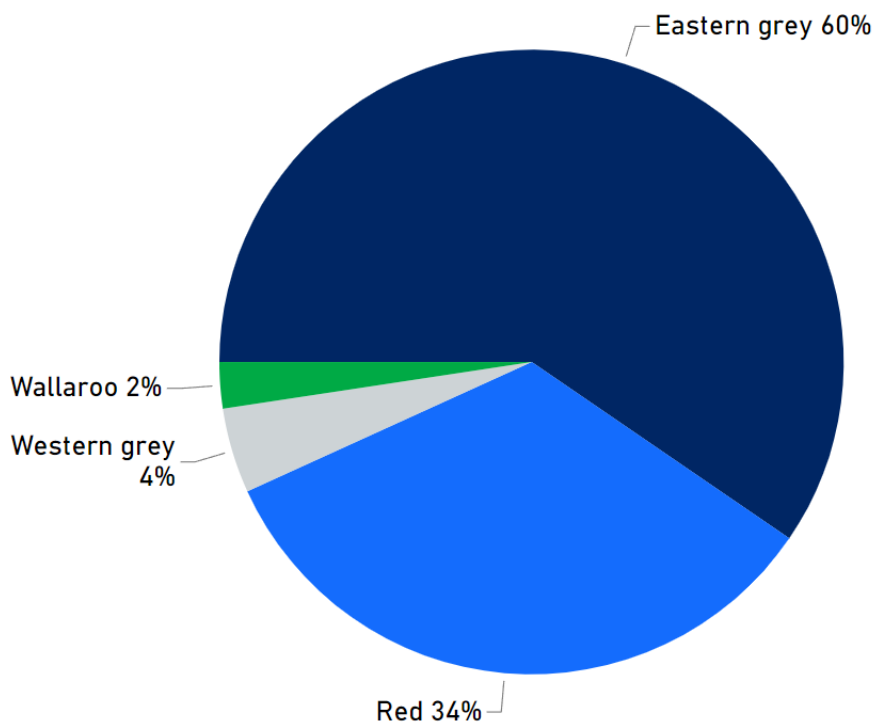


Figure 2 Contribution to the total harvest of each of the 4 commercially harvested species

Special quota

The Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South Wales 2022–26 allows for setting a special quota as an addition to the overall commercial quota if the commercial quota is exhausted or likely to be fully allocated. The intent of using a special quota is to minimise the number of kangaroos shot under non-commercial licences by allowing increased commercial use of kangaroos that would otherwise be shot and left in the field.

In deciding whether to release a special quota, the department will consult the Kangaroo Management Advisory Panel and consider local conditions, climatic trends, population trends and Western Lands de-stocking orders to ensure populations can remain viable with increased harvest. When used, special quotas will be set at a maximum of 5% of the population estimate of each kangaroo species in any one zone, and a maximum of 1.5% of the population of each species across all zones. Special quotas will not be allocated where the commercial harvest is reduced or suspended due to low populations.

The special quota was not used during 2023.

Gender bias by species and zone

Harvesting is typically biased towards male animals because they are larger, heavier and provide a better return, as harvesters are paid a price per kilogram. Over the 24-year period from 1999 to 2022, the average proportion of males harvested was 74.3% for eastern greys, 75.6% for red kangaroos, 92.4% for wallaroos and 71.2% for western greys (Figure 3). These percentages vary between years. In 2023, much higher percentages of male eastern greys (81.4%), red kangaroos (85.2%), wallaroos (99.6%) and western greys (82.7%) were harvested when compared with the average of the previous 24 years.

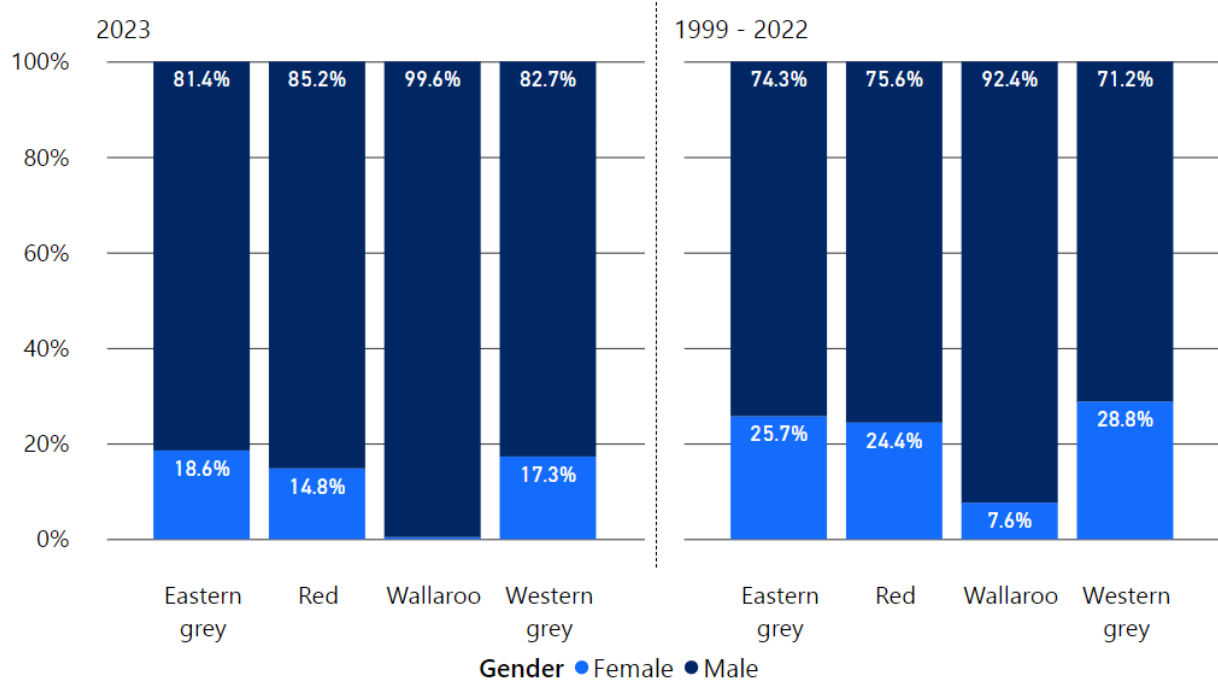


Figure 3 Average gender bias per species in the commercial harvest for 2023 compared with the averages for the 24-year period from 1999 to 2022

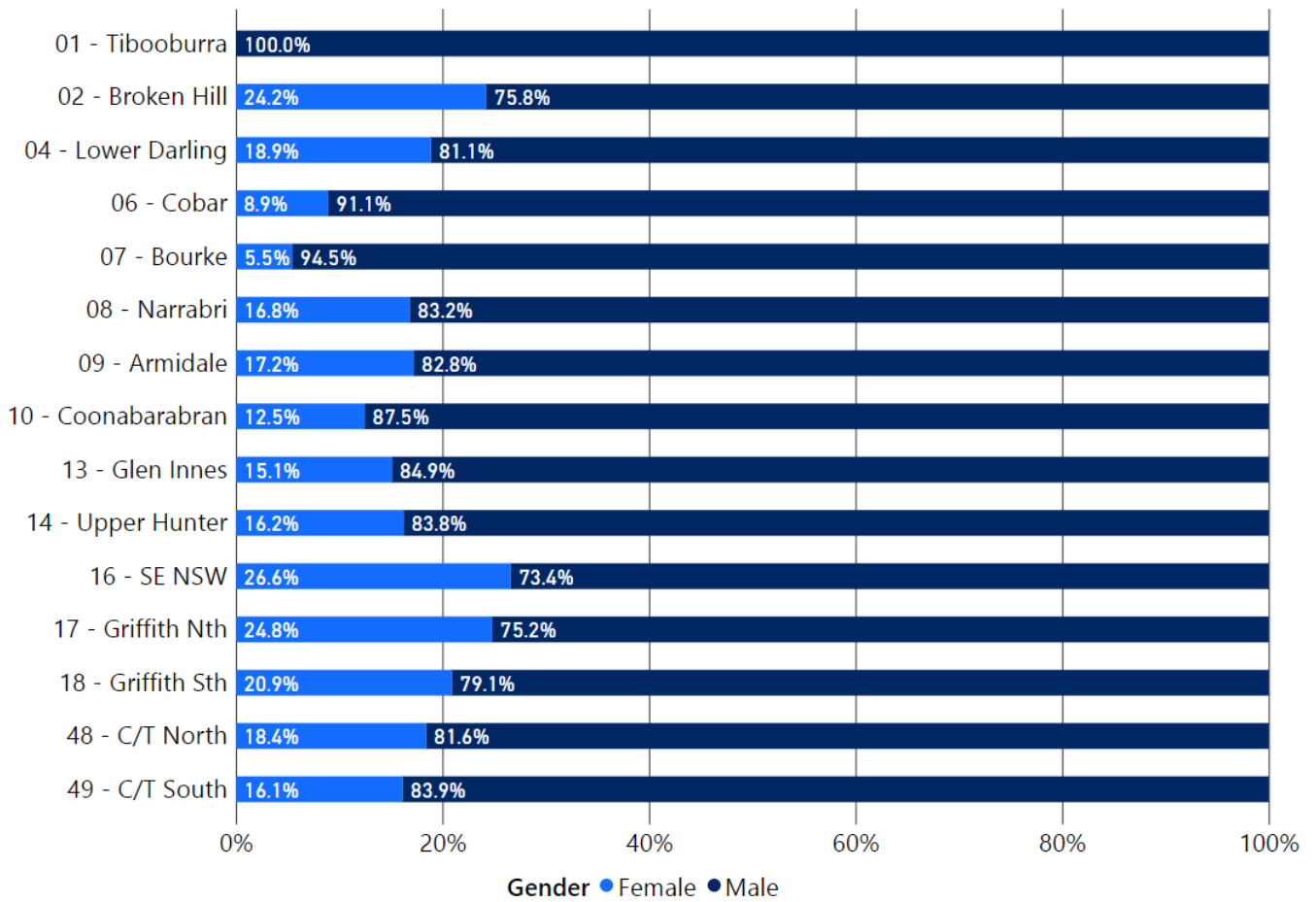


Figure 4 Eastern grey gender bias by zone in the 2023 commercial harvest

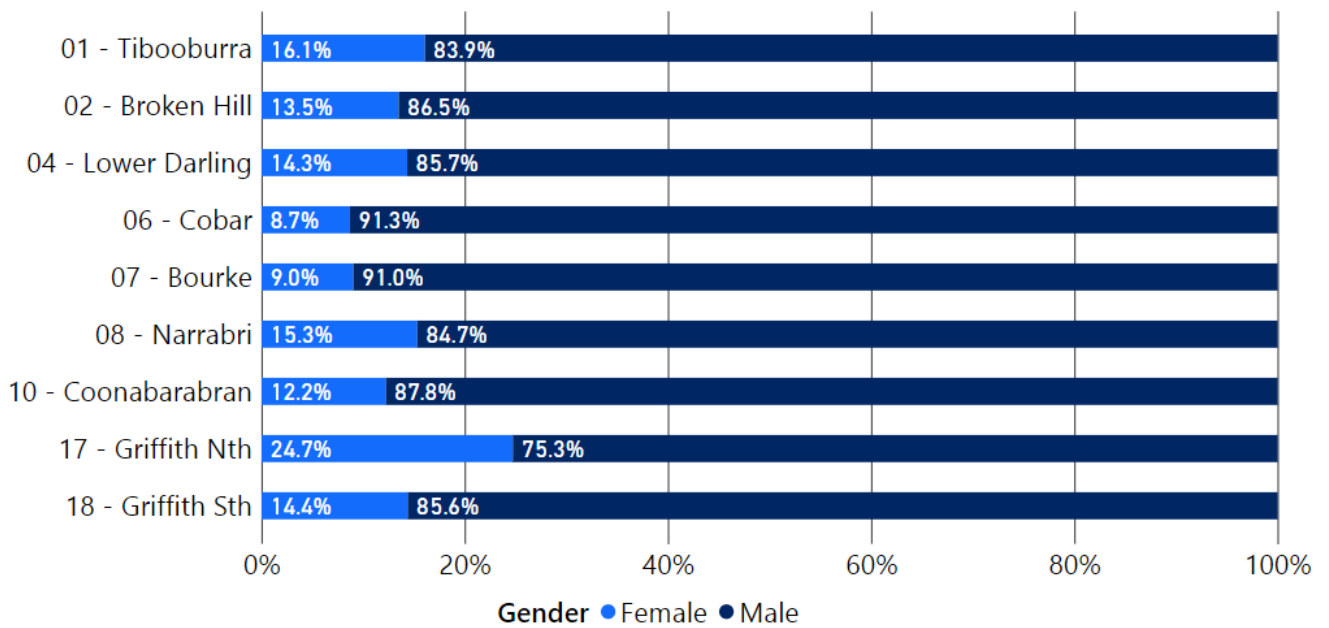


Figure 5 Red kangaroo gender bias by zone in the 2023 commercial harvest

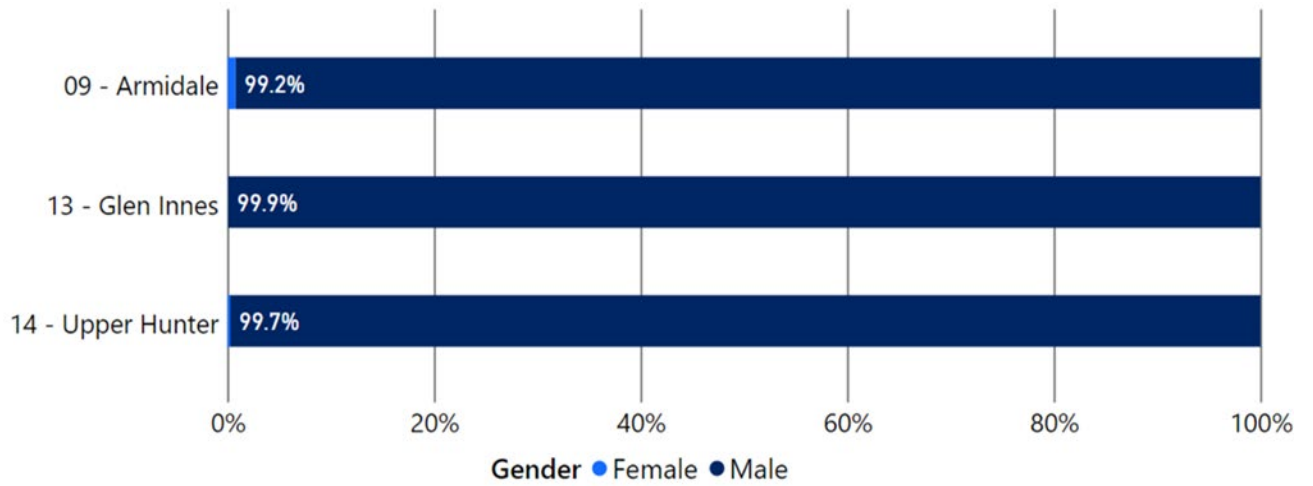


Figure 6 Wallaroo gender bias by zone in the 2023 commercial harvest

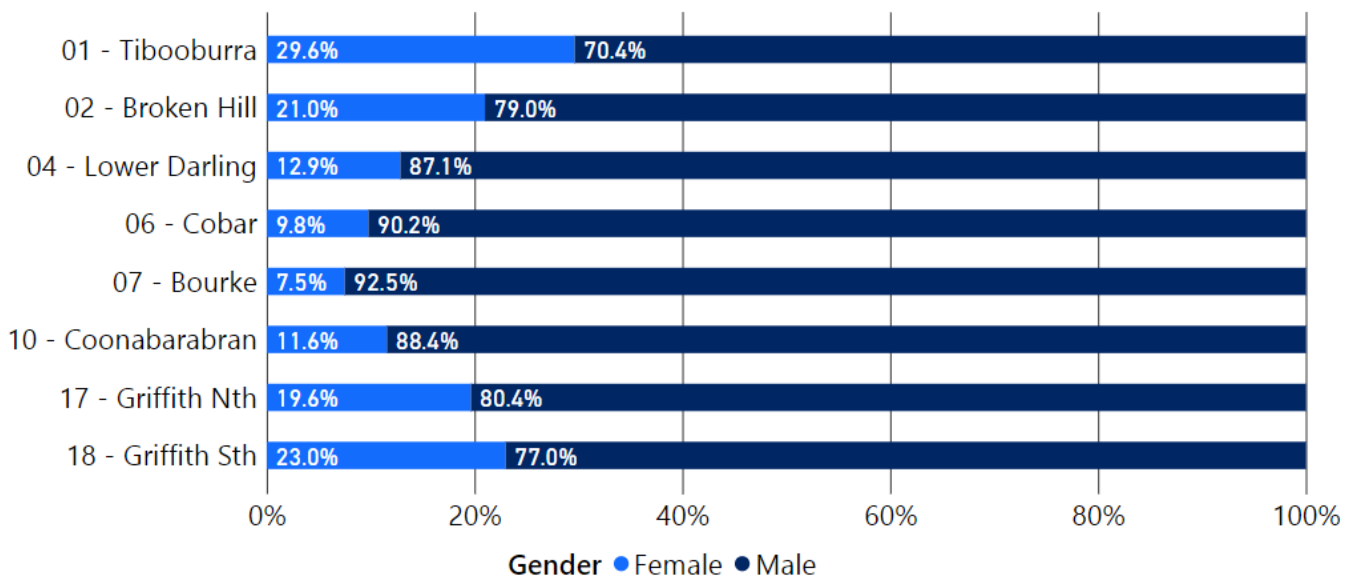


Figure 7 Western grey gender bias by zone in the 2023 commercial harvest

Average weights by species and zone

During 2023, commercial harvest licence conditions required that kangaroo carcasses delivered to chillers for sale were not to weigh less than 14 or 15 kg (the 2 different values reflect differences in the way the carcasses are dressed).

Before 1 January 2008, the minimum carcass weights were 12 and 13 kg dressed and undressed, respectively. Above these minimum weights, a wide range of weights are consigned by harvesters.

The 24-year average (1999 to 2022) carcass weights by gender and species (across all zones) are shown in Figure 8. Data collected from harvester returns during 2023 indicate average carcass weight across all species was 29.0 kg for males and 19.2 kg for females (Table 1 and Table 2); these values are higher than the long-term averages. This is to be expected, given the increase in minimum carcass weight as part of licence conditions.

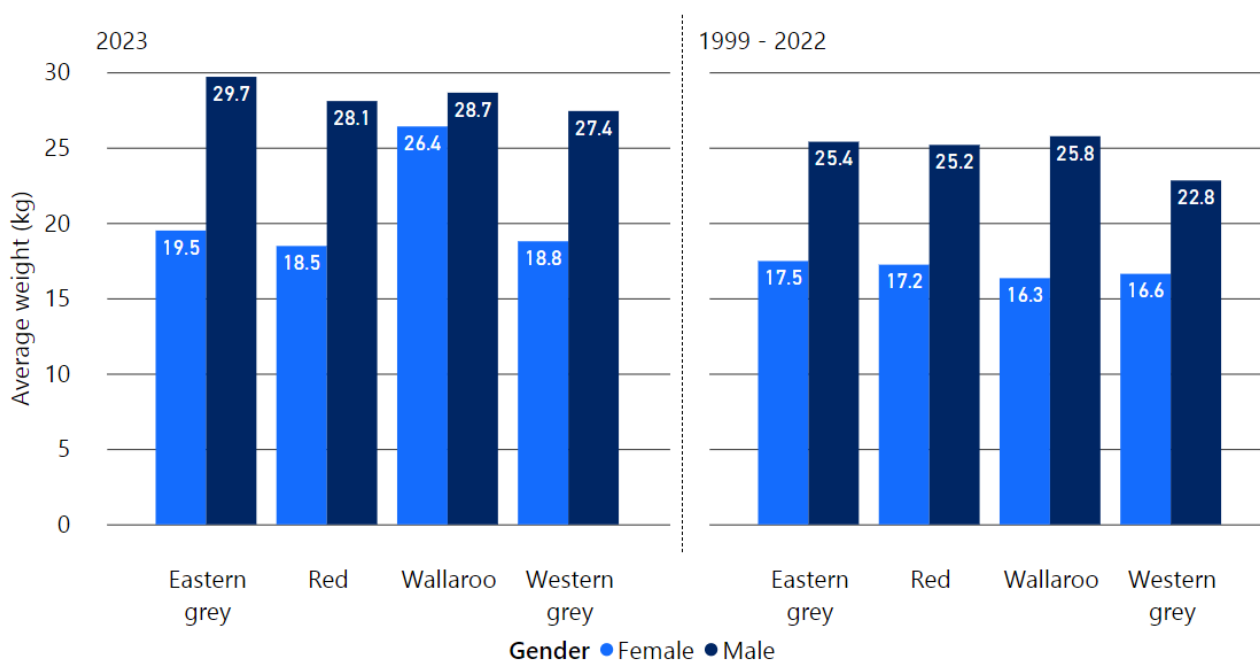


Figure 8 Average weights of male and female carcasses by species for 2023 compared with the averages for the 24-year period from 1999 to 2022

The department does not require licensees to record individual carcass weights. Instead, harvester returns provide total weights for each category of carcass (e.g. mean weight of male eastern grey kangaroos = total weight of male eastern grey kangaroos divided by the number of male eastern grey kangaroos). These totals are used to calculate the average weights of carcasses by gender, species and zone (Figure 8 to Figure 12).

For most combinations of species, gender and zone, average carcass weights were reasonably consistent from month to month. In the following charts, no consideration is given to the differences in sample sizes between gender, species and zones.

Where large fluctuations occur, the sample size is usually very small and statistical reliability is lower. This variation is usually a result of statistical processes and is not a reflection of changes in the kangaroo population. Weights do not vary very much where larger samples are available.

In the charts that follow (Figure 9 to Figure 12), there are several months in which no animals of a given gender or species were harvested in a particular zone; this results in missing columns in the charts. For example, in Figure 12 there were no western grey males or females harvested in the Coonabarabran zone in January, July and December 2023.

During routine inspections of chiller premises and processing works, a selection of smaller animals is weighed individually by compliance officers to ensure the minimum weight standards are being maintained. If underweight carcasses are detected, the harvester responsible may be cautioned or fined, depending on the circumstances.

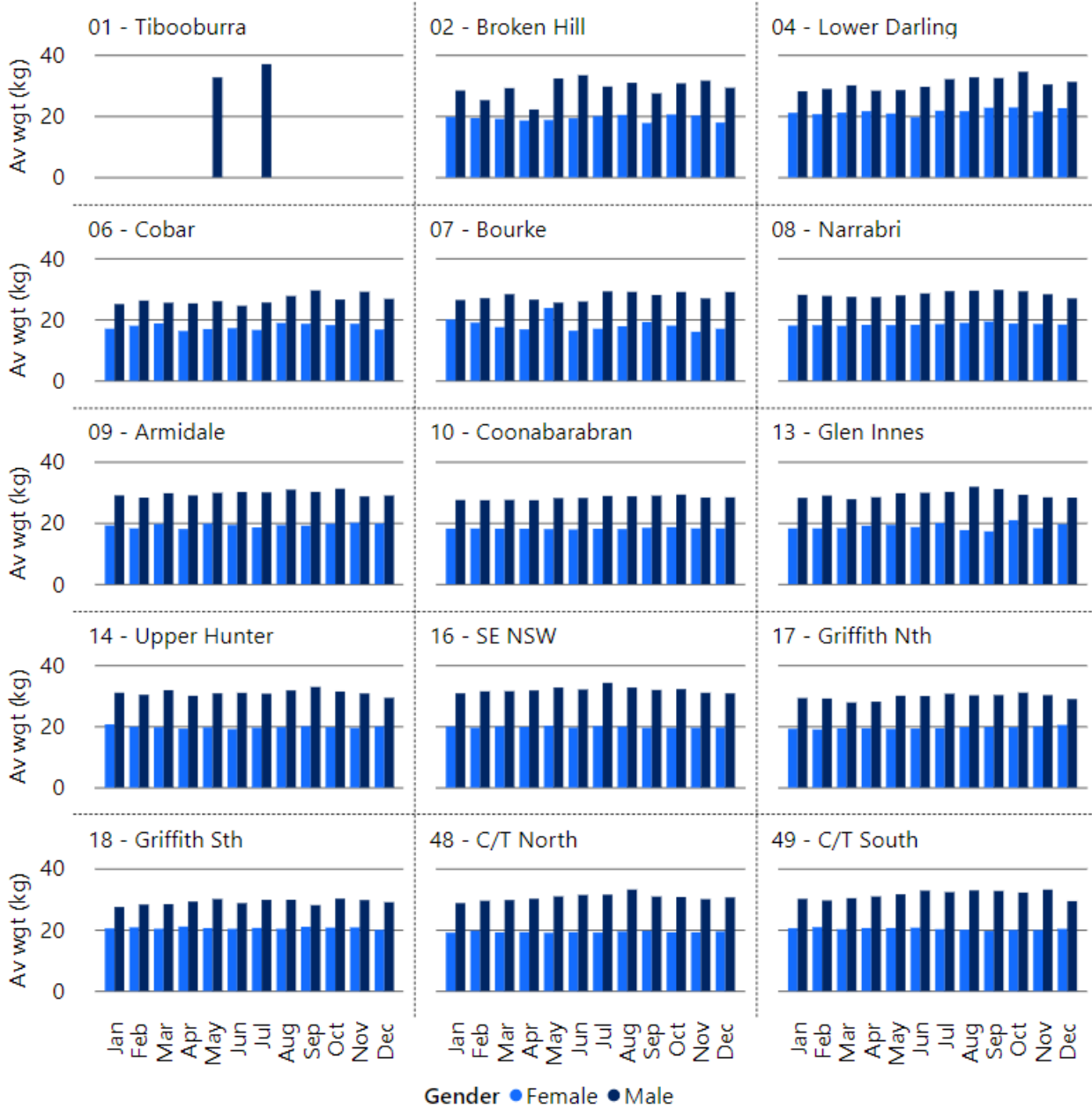


Figure 9 Average weights of eastern grey kangaroo male and female carcasses for each zone in the 2023 commercial harvest

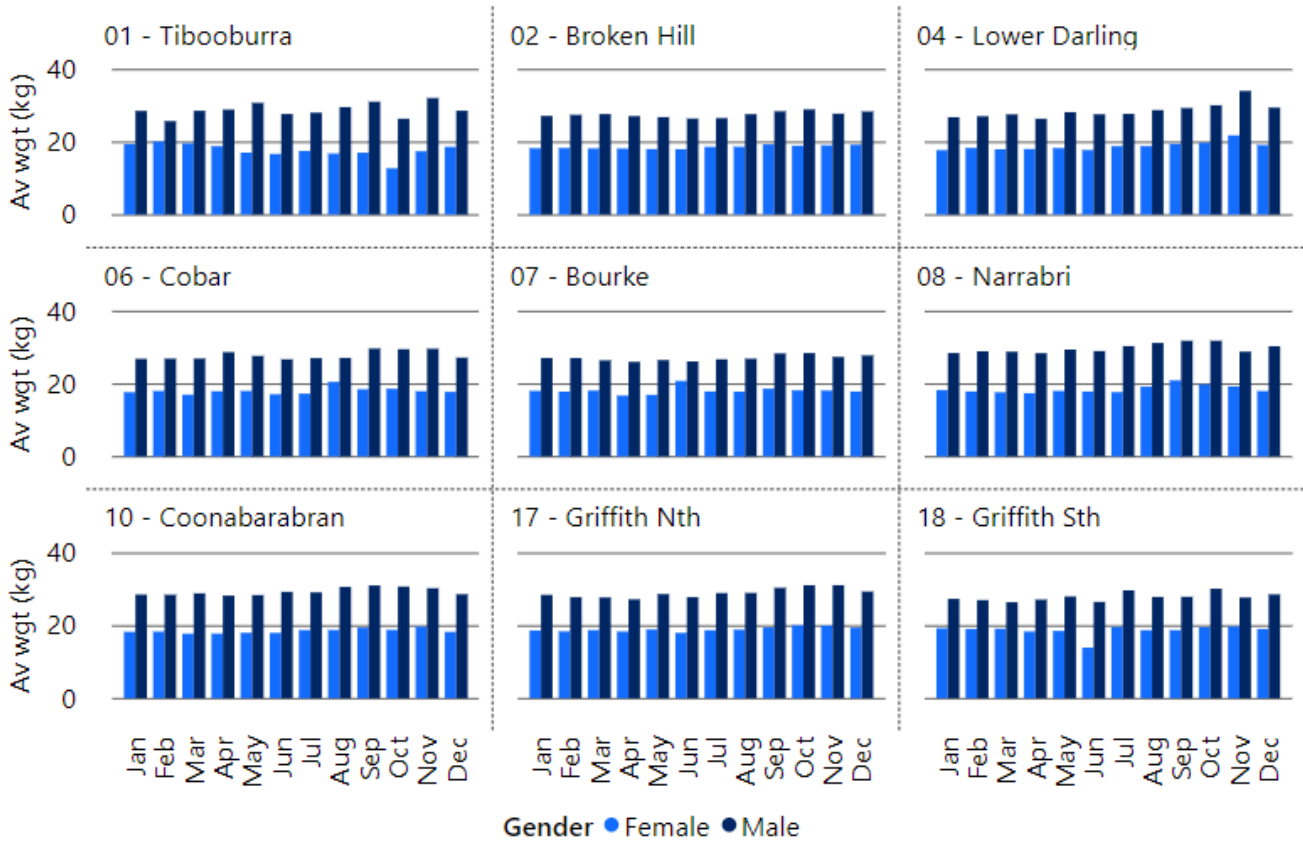


Figure 10 Average weights of red kangaroo male and female carcasses for each zone in the 2023 commercial harvest

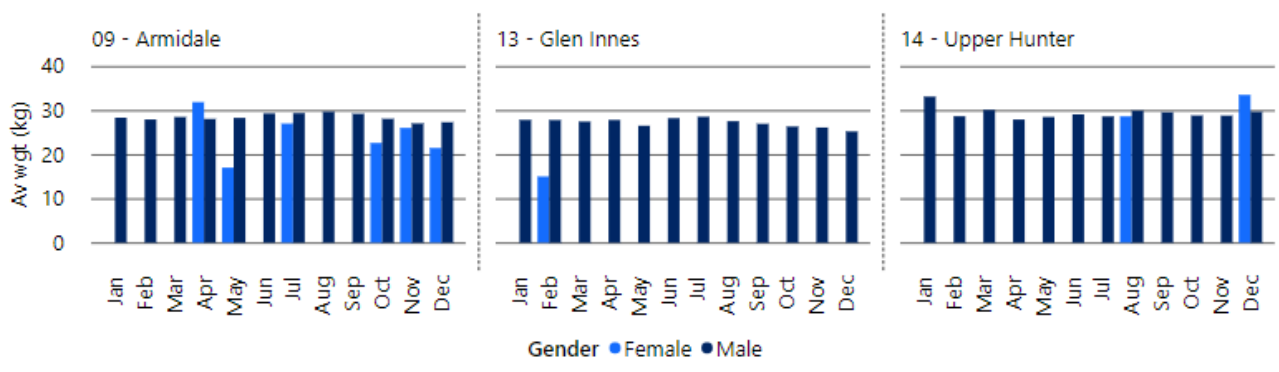


Figure 11 Average weights of common wallaroo male and female carcasses for each zone in the 2023 commercial harvest

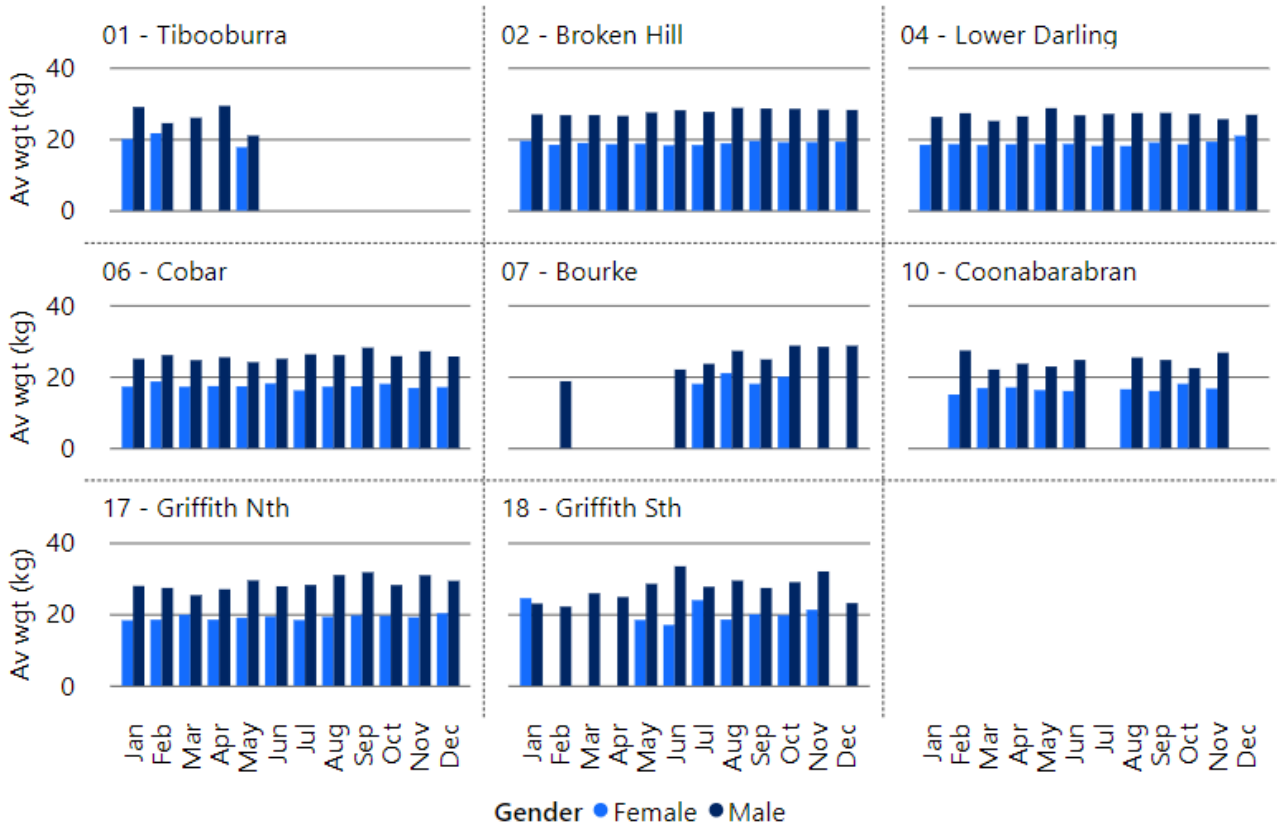


Figure 12 Average weights of western grey kangaroo male and female carcasses for each zone in the 2023 commercial harvest

Non-commercial culling within the commercial harvest zones

In New South Wales, landholders who are negatively impacted by kangaroos may apply to the NSW National Parks and Wildlife Service for a non-commercial culling licence. These licences are generally issued where impacts such as property damage, risk to human health or safety, or economic hardship cannot be adequately managed by non-lethal measures or commercial harvesting.

Non-commercial licences are available statewide and can be issued for properties where commercial harvesting is also undertaken. While these licences may authorise culling of any non-threatened macropod species, for consistency with the rest of this report, the figures below only relate to the 4 species subject to commercial harvest in New South Wales. The non-commercial cull is usually highest in those areas where high-value pastures and winter crops are important.

In 2023, licences were issued to cull 170,665 kangaroos within the commercial harvest zones. Licensees who submitted reports indicated 56,899 kangaroos were culled under these licences authorising culling of up to 109,200 kangaroos. A number of licensees have not yet submitted reports, with these licences authorising culling of up to 61,465 kangaroos.

Combining the number reported as culled (where a return has been received = 56,899) with the number authorised to be culled (where a return has not been received = 61,465) gives a maximum non-commercial cull figure of 118,364 kangaroos. Please note that these figures are the non-commercial cull for the 4 commercially harvested large macropod species across the commercial kangaroo management zones of New South Wales.

Maximum non-commercial cull by species and by commercial kangaroo management zone is shown in Table 3.

Table 3 Maximum non-commercial cull by commercial zone and by species

Zone	Wallaroos	Eastern grey kangaroos	Red kangaroos	Western grey kangaroos	Total
01 – Tibooburra	10	10	10	10	40
02 – Broken Hill	473	1,734	2,325	1,874	6,406
04 – Lower Darling	100	810	1,684	1,251	3,845
06 – Cobar		693	347	438	1,478
07 – Bourke		100	100	100	300
08 – Narrabri	61	3,654	1,207	65	4,987

Zone	Wallaroos	Eastern grey kangaroos	Red kangaroos	Western grey kangaroos	Total
09 – Armidale	98	1,615			1,713
10 – Coonabarabran	293	4,581	591	484	5,949
13 – Glen Innes	916	7,560	2	108	8,586
14 – Upper Hunter	96	602			698
16 – South East NSW	248	37,978	50		38,276
17 – Griffith North		5,972	2,038	1,346	9,356
18 – Griffith South		7,581	1,329	250	9,160
48 – Central Tablelands North	1,104	11,103			12,207
49 – Central Tablelands South	146	15,214	2	1	15,363
Totals	3,545	99,207	9,685	5,927	118,364

The highest maximum non-commercial cull was in the South East zone at 38,276 kangaroos. This is approximately one-third more than the commercial harvest in the South East zone in 2023 (30,519) and is 2.7% of the estimated kangaroo population in the South East zone (Table 4).

Table 4 Maximum non-commercial cull as a percentage of total kangaroo population

Zone	Total kangaroo population	Potential non-commercial cull	Non-commercial cull percentage
01 – Tibooburra	360,860	40	0.0
02 – Broken Hill	1,958,002	6,406	0.3
04 – Lower Darling	1,007,984	3,845	0.4
06 – Cobar	223,473	1,478	0.7
07 – Bourke	244,754	300	0.1
08 – Narrabri	635,120	4,987	0.8
09 – Armidale	582,712	1,713	0.3
10 – Coonabarabran	1,240,233	5,949	0.5
13 – Glen Innes	555,844	8,586	1.5
14 – Upper Hunter	373,630	698	0.2
16 – South East NSW	1,428,800	38,276	2.7
17 – Griffith North	1,140,527	9,356	0.8
18 – Griffith South	867,554	9,160	1.0

Zone	Total kangaroo population	Potential non-commercial cull	Non-commercial cull percentage
48 – Central Tablelands North	777,350	12,207	1.6
49 – Central Tablelands South	488,270	15,363	3.1
Totals	11,885,113	118,364	1.0

The difference in method for calculating maximum non-commercial cull figures (based on reports and extrapolation) and commercial harvest figures (solely based on reports) should be taken into account when combining data from these 2 different sources.

Monitoring compliance in the commercial harvest zones

Compliance

During 2023, there were 536 licensed commercial harvesters with approximately 2,797 approved landholder consents (some properties may have provided consent to multiple harvesters) for commercial harvesting. These properties cover 15.3 million hectares. There were also 107 registered premises, 20 licensed animal dealers and 4 licensed skin dealers.

Compliance monitoring of licensees is performed by the department's compliance officers, with additional monitoring by NSW Food Authority, firearms licensing audits by NSW Police Force and field inspections by departmental regional compliance and regulation officers.

Regional compliance and regulation officers inspect carcasses, harvesters' vehicles and equipment, chiller premises and processors for compliance with licence conditions.

Licensing staff contributed to compliance by communicating with and educating licensees, assessing applications, compiling reports and reporting suspect activities and irregularities to regional compliance officers.

Regional compliance and regulation officers investigate reports of illegal harvesting activities. In 2023, 32 reports of potential licence breaches and other illegal activity were received, involving commercial licensees or for commercial purposes. On investigation, several were dismissed because no evidence was found to substantiate the report, or the activities were licensed.

Information to assist law enforcement, including compliance with the *Biodiversity Conservation Act 2016* (BC Act), *Firearms Act 1996* and *Food Act 2003*, is shared as required with NSW Police Force, NSW Food Authority, the Australian Department of Climate Change, Energy, the Environment and Water, and interstate fauna protection agencies, within the boundaries of NSW privacy legislation. For example, from late 2020, a monthly report detailing licensed professional kangaroo harvesters and registered chiller premises has been supplied to NSW Police Force.

Reports involving matters related to food safety were referred to NSW Food Authority in accordance with the memorandum of understanding between the department and the NSW Food Authority.

Activities involving non-commercial shooting were referred to the relevant NSW National Parks and Wildlife Service office.

Inspections of premises

Regional compliance officers and NSW Food Authority compliance staff inspected chillers in commercial kangaroo management zones for:

- non-head-shot carcasses
- underweight carcasses
- valid tags
- correctly affixed tags (correct species and zone)
- untagged carcasses
- display of premises registration number and certificate
- presence of other animal carcasses.

Harvester vehicles are checked for:

- appropriate NSW Food Authority registration (for either human consumption or pet food)
- correct set-up and fit-out (in accordance with an NSW Food Authority memorandum of understanding)
- untagged and underweight carcasses.

Harvesters are also checked to ensure they are carrying a kangaroo harvester's licence issued under the BC Act.

During 2023, there were 107 registered premises. A total of 128 chiller inspections, 10 processing works inspections and one skin dealer inspection were conducted by the department during 2023. A further 23 audits of chiller premises and 47 inspections of game meat harvester vehicles were conducted by NSW Food Authority.

Table 5 shows the number of chiller and processing works inspections undertaken in each of the last 5 years.

Table 5 Number of chiller and animal dealer/skin dealer inspections undertaken by year

Year	Chiller inspections	Animal dealer/skin dealer processing works inspections
2019	>121	27
2020	364	32
2021	152	16
2022	109	13
2023	128	11

Infringement notices

Issuing of verbal cautions, written warnings or penalty infringement notices is at the discretion of the regional compliance officer, in accordance with the department's Compliance Policy (OEH 2018).

Although cautions do not attract penalties, they are recorded and taken into account in any future compliance considerations and risk assessment procedures. Table 6 summarises compliance response outputs for 2023.

Table 6 Compliance outputs 2023

	Advisory letter	Official caution	Warning letter	Penalty infringement notice	Total
Non-head-shot			12	5	17
Underweight carcasses					
Incorrect display on chiller		1	1	4	6
All other breaches of licence conditions	3		1	5	9
Total	3	1	14	14	32

Licence suspensions

In the 2023 licensing year there were no licence suspensions.

Prosecutions

There were no prosecutions in 2023.

Other factors affecting the commercial harvest in 2023

Reduced or suspended quotas

Three zones had reduced quotas in 2023. These are listed in Table 7. The zone quota is reduced to 10% of the population estimate when the population falls between 1.5 and 2.0 standard deviations below the long-term average. There were no zones closed in 2023. The zone is closed when the population estimate is 2 or more standard deviations below the long-term average.

Table 7 Zones with reduced or suspended quotas in 2023

Management zone*	Species	Status
01 – Tibooburra	Eastern grey	Reduced (10% quota)
	Western grey	Reduced (10% quota)
07 – Bourke	Eastern grey	Reduced (10% quota)
	Western grey	Reduced (10% quota)
08 – Narrabri	Eastern grey	Reduced (10% quota)

*This table does not include all zones with quotas set in 2023. It shows only zones with suspended or reduced quotas, or zones that reopened in 2023 after being reduced or closed the previous year.

No quota is set for western grey kangaroos in the Narrabri kangaroo zone because it has only a small population due to being the eastern edge of their range.

Carcass price

Prices paid by dealers to harvesters for kangaroo carcasses declined in 2023 to \$1.00 to \$1.40 per kilogram, compared to \$1.30 to \$1.50 in 2022. This was due to a range of factors, including limited cold storage space (in several states), high cost of energy (impacting processing costs), high cost of fuel (impacting transport costs), and reduced export demand.

Program and policy developments

Digital tags proof-of-concept trial

Technology to support a proof-of-concept trial of digital tags was initiated in 2022 and further developed in 2023.

Harvesters participating in the trial applied an extra tag to a kangaroo carcass with a scannable QR code that recorded key information, such as precise location and time of harvest. The harvester then entered other information, including species, gender and weight, into a custom-built smartphone app (TagTrac). This process eliminates the need for manual recording of harvest information.

The proof-of-concept trial took place in the late spring of 2023, with a subset of licensees voluntarily participating. A report on trial outcomes and next steps will be progressed in 2024.

Harvester knowledge course and assessment

In 2022 a harvester knowledge refresher course and assessment were developed in conjunction with TAFE Digital. The course and assessment were introduced in 2023 as a mandatory requirement for all new licence applicants. Completion of the course and assessment was also introduced as a requirement of any licence holder found to have breached their licence conditions during 2023. The course will be further rolled out to all commercial licence applicants in 2024 who have not already done it.

Online licensing system enhancements

The Wildlife Management System (WMS) enhancements in 2023 focused on 2 areas:

- extensive development to enable the trial of the digital tags
- comprehensive testing of the TAFE harvester knowledge course enhancement.

These enhancements are part of an ongoing continuous improvement approach adopted by the Kangaroo Management Program.

Research involvement in 2023

Apart from annual population surveys, no research projects were undertaken by the Kangaroo Management Program in 2023.

Research funded in 2023

In 2022, the NSW Kangaroo Management Program and AgriFutures jointly funded 2 PhD scholarships for research to improve the Kangaroo Management Program.

One of the PhDs is being undertaken by Evan Curtis and is titled *Determining optimal management strategies for 4 large macropods in NSW*. It commenced in late 2022 and continues to progress.

The second PhD scholarship is to be progressed in 2024.

More information

- [2023 Quota Report: NSW Commercial Kangaroo Management Program](#)
- [2024 Quota Report: NSW Commercial Kangaroo Management Program](#)
- [Compliance Policy](#)
- [Kangaroo management in NSW](#)
- [Kangaroo management plans, reports and research](#)

Appendix A: Progress in 2023 against performance indicators

Action	Performance indicator	Performance in 2023
Aim 1: Ensure commercial harvest of kangaroos in New South Wales is humane		
Action 1.1: Implement and enforce the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes across all commercial harvesting activity in New South Wales	1. Licence conditions specify the commercial harvesting of kangaroos in New South Wales must be done in accordance with the national code.	100% of harvester licences include conditions requiring compliance with the national code.
	2. All identified incidences of non-compliance with licence conditions related to inhumane harvesting are investigated, and appropriate compliance action is taken.	Complete. All detected incidences of non-compliance were investigated, and appropriate action was taken.
	3. Harvester licences are issued only to applicants who have completed the game harvester statement of attainment or equivalent, have met shooter competency standards, and hold a current firearms licence.	100% of harvesters licensed in 2023 had completed game harvester statement of attainment or equivalent, met shooter competency standards, and held a current firearms licence. These are a prerequisite to obtaining a harvester licence.
Action 1.2: Facilitate capacity building and engagement opportunities to maintain harvester	1. Copies of the national code and education materials are provided to all licensees and made available through the department's website.	All harvesters are mailed a copy of the national code upon their first licence approval following publication of the code in late 2020.

Action	Performance indicator	Performance in 2023
competency to meet national code requirements	2. A capacity building program to improve and maintain harvester competency, and increase voluntary compliance with licence conditions, is developed and implemented within the life of this plan.	In 2022, the NSW Kangaroo Management Program (KMP) worked with TAFE NSW to develop an online harvester course and assessment focused on the national code and the harvester licence conditions. This was implemented in June 2023 to all new harvesters. All licensed harvesters will complete the course by the end of 2024.
Aim 2: Ensure commercial harvest of kangaroos in New South Wales is ecologically sustainable		
Action 2.1: Kangaroo population estimates are determined using scientifically rigorous population surveys	1. Fixed-wing aircraft surveys are conducted annually on the inland plains during winter. Population estimates are calculated for each inland plains commercial kangaroo management zone by 30 November each year.	Completed for 2023.
	2. Helicopter surveys are completed in one region annually, and tableland regions are surveyed triennially. Population estimates are calculated by 30 November in the year of survey.	Completed. In 2023 the Central Tablelands region was surveyed.
Action 2.2: Proportional commercial harvest quotas are set and reported annually for each commercial kangaroo management zone	1. Quota reports are submitted to the relevant Australian Government department and published on the NSW Department of Climate Change, Energy, the Environment and Water website by 1 December each year.	Completed.
	2. Annual commercial harvest quotas are set for each species and commercial kangaroo management zone for harvesting to commence 1 January each year.	Completed. See quota report.
	3. Maximum harvest quotas are set at 15% of the population for eastern grey kangaroos, western grey kangaroos and common wallaroos, and 17% of the population for red kangaroos.	Completed. See quota report.

Action	Performance indicator	Performance in 2023
	4. Quotas on populations that are between 1.5 and 2 standard deviations below their long-term averages are calculated at a reduced rate of 10% of the population.	Completed. See quota report.
	5. Quotas on populations that are 2 or more standard deviations below their long-term averages are suspended.	Completed. See quota report.
Action 2.3: Harvest data are monitored to ensure quotas are not exceeded	1. Proportion of monthly harvester returns submitted on time.	Harvester returns were monitored monthly. Harvesters with late returns were emailed and blocked from ordering new tags. Across the year 98% of returns were submitted.
	2. Proportion of monthly harvester returns submitted accurately.	All harvester returns are consistent with their commercial tag advices. Tag allocation does not exceed quota in any zone at any time, ensuring harvest does not exceed quota in any zone at any time.
	3. Monthly tag allocations and harvester returns analysed and published online within 14 days of the end of the month.	Completed.
Action 2.4: Identify any potential threats to population health	1. Any reports received relating to kangaroo health or mortality events are recorded and referred to the appropriate authorities.	No reports of unusual health or mortality events were received in 2023.
Aim 3: Be open, accountable and transparent		
Action 3.1: Maintain public website with relevant	1. The following information, as a minimum, is regularly reviewed and kept current on the Kangaroo Management Program web pages:	Completed. The <i>Kangaroo management in NSW</i> pages are

Action	Performance indicator	Performance in 2023
documents and current information	<ul style="list-style-type: none"> a. a statement of the reasons commercial harvest is undertaken in this state b. current versions of the NSW Commercial Kangaroo Harvest Management Plan, annual report and quota report Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South Wales 2022–26 c. annual reports and quota reports from the past 5 years d. commercial harvest and tag allocation reports from at least the past 12 months e. current licence conditions for kangaroo harvesters, kangaroo dealers and kangaroo skin dealers f. National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes g. contact information for the NSW Kangaroo Management Program. 	regularly revised and new reports published to maintain website currency.
Action 3.2: Engage a Kangaroo Management Advisory Panel to provide expert advice on relevant kangaroo management issues	1. The panel meets at least twice per year to review progress and provide advice on implementation and review of the management plan.	Completed. The Kangaroo Management Advisory Panel (KMAP) met on 24 and 25 May 2023 and 15 November 2023. Minutes are on the KMP web pages.
	2. The department provides the panel with timely and relevant information and reports to perform its functions throughout the life of the plan.	Completed. Regular updates were provided to KMAP members.
Action 3.3: Respond to information requests	1. A stakeholder communication and engagement strategy are developed in the first 12 months and implemented throughout the life of this plan.	Completed.
	2. Media releases on issues of interest to the community are prepared for approval by the NSW Minister when appropriate.	A media campaign (print, radio and social media) to notify the community of the 2023 helicopter

Action	Performance indicator	Performance in 2023
		surveys was undertaken in August 2023.
	3. Responses to all media enquiries are provided in a timely way.	Completed.
	4. Approved relevant departmental staff will participate in relevant interviews with the media upon request.	No media interviews were provided during 2023.
	5. Enquiries received will be responded to within 2 working days for simple requests and within 28 working days for more complex responses.	Completed.
Aim 4: Implement effective and efficient regulation and administration		
Action 4.1: All activities relating to the commercial harvest of kangaroos in New South Wales are licensed in accordance with BC Act, Regulation and policy	1. Databases of licensee and registration information are accurate, complete and up to date.	Completed. The Wildlife Management System (WMS) is a real time licensing system.
	2. A sample of licences is assessed annually to confirm they are being processed and issued in accordance with relevant legislation and departmental policy.	Completed.
Action 4.2: Licence conditions are effectively applied	1. Licence conditions are reviewed biennially.	Completed. Licence conditions were reviewed prior to implementation in 2023 and in preparation for the 2024 licensing year.
	2. Licensees are advised of changes to licence conditions in writing within 7 days of the changes taking effect.	Completed.
	3. Advisory materials to explain changes to licence conditions are developed and distributed with the notification of change.	Not required. Changes to licence conditions were minor.
Action 4.3: Tagging, landholder consent and	1. Opportunities to improve carcass traceability, compliance, data accuracy and utility will be evaluated when available.	Completed. In 2023 NSW KMP conducted a digital tagging

Action	Performance indicator	Performance in 2023
reporting processes enable program accountability and compliance		system trial. Results regarding improved carcass traceability, compliance and data accuracy will be further analysed in 2024.
Aim 5: Effectively promote, monitor and enforce compliance		
Action 5.1: Develop and implement a kangaroo management compliance strategy and annual action plan	1. Annual review and prioritisation of compliance and enforcement focus areas that respond to current risks and trends in the industry.	Regional compliance workshop held in Albury in August 2023.
Action 5.2: Regular and opportunistic monitoring of licensees for compliance with licence conditions and legislation	1. Chiller premises and processing works (kangaroo carcasses and skins) are inspected on average a minimum of 1.5 times per year to ensure compliance with NSW legislation and licence conditions.	There were 139 registered premises inspections by department compliance officers and 23 by NSW Food Authority. There were 107 registered premises in 2023. The department's inspection rate of 1.3 is slightly lower than the targeted 1.5 inspections per chiller on average.
	2. At least 0.5% of carcasses are inspected each year for signs of unlicensed activities, breaches of licence conditions and other evidence contrary to the program's objectives for a humane and sustainable harvest.	Chiller inspections aim to assess 5 carcasses per chiller. The total number of carcasses inspected in 2023 was approximately 695, or 0.14% of the total carcasses harvested.

Action	Performance indicator	Performance in 2023
Action 5.3: Investigation of and appropriate response to non-compliance	1. All reports of unauthorised activities and activities in breach of licence conditions are submitted to relevant compliance teams. Compliance teams may impose enforcement actions such as issue of verbal cautions, written warnings or infringement notices, and prosecution or revocation of licences and registrations in accordance with the department's compliance policy and prosecution guidelines.	Completed.
Action 5.4: A collaborative approach to compliance	1. Review and establish formal agreements with other New South Wales and cross-border agencies to develop collaborative approaches, establish cross-authorisation and share intelligence and information that leads to improved compliance.	The KMP and NSW DPI Hunting commenced an intelligence sharing pilot project to support improved compliance enforcement outcomes. A revised memorandum of understanding between KMP and the NSW Food Authority was prepared, ready for signing in 2024.
Aim 6: Facilitate adaptive management and research		
Action 6.1: Foster and support research to improve animal welfare outcomes	1. Contribute to any review of the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes during the life of this plan.	N/A. No code review was undertaken during 2023.
	2. Assess all research proposals for opportunities to facilitate improvements to animal welfare outcomes in the Kangaroo Management Program.	No new research proposals developed in 2023.
	3. All research led by the department involving animals will be conducted in accordance with approval from the department's Animal Ethics Committee and the Australian code for the care and use of animals for scientific purposes (National Health and Medical Research Council, 2013).	N/A. KMP did not contribute to research involving animals.

Action	Performance indicator	Performance in 2023
Action 6.2: Foster and support research to improve kangaroo census and population modelling	1. All research proposals are assessed for opportunities to identify improvements in kangaroo census and population modelling techniques.	NSW KMP contributed funds in 2022 to support a PhD scholarship focused on improving kangaroo population estimation and management. That project continues to make good progress.
	2. All research led by the department involving animals will be conducted in accordance with approval from the department's Animal Ethics Committee and the Australian code for the care and use of animal for scientific purposes.	N/A. No research was led by the NSW KMP.
Action 6.3: Facilitate adaptive management experiments to test deliberate management interventions where practicable	1. Any proposals to undertake active adaptive management experiments are reviewed and assessed by the department in accordance with the criteria outlined in this plan.	N/A. No adaptive management experiments were proposed during 2023.
	2. All adaptive management experiments undertaken by, or in partnership with, the department are monitored and conducted according to approved conditions, including any animal welfare and ethics approvals.	N/A. No adaptive management experiments were proposed during 2023.
Action 6.4: Share historical survey and harvest data	1. A strategy, data structure and suitable platform to make historical survey and harvest data available to the public is investigated within the first 2 years of this plan.	Work in progress. Publishing historical survey and harvest data in a more accessible format will be considered as part of a website rebuild in 2024–25. Historical survey and harvest data are currently available in reports on the KMP web pages.
	2. Subject to the plausibility of this strategy (as above), historical data are released by the end of year 4 of this plan.	N/A at this stage.

Aim 7: Undertake program reporting and review

Action	Performance indicator	Performance in 2023
<p>Action 7.1: Produce and publish regular reports</p>	<p>1. The following reports will be produced and published on the department's kangaroo management web pages:</p> <ul style="list-style-type: none"> a. monthly tag allocation report by the 5th day of the month for the preceding month b. monthly harvest report by the 15th day of the month for the preceding month. 	<p>Completed. Monthly tag allocation and harvest reports are published within the required timeframes.</p>
	<p>2. The following reports will be produced and published on the department's kangaroo management web pages and provided to the Australian Government on time:</p> <ul style="list-style-type: none"> a. annual allocation and harvest reports by the end of February each year for the preceding year b. annual report on the operation of the plan by the end of March each year for the preceding year c. quota report, stating population size and quota allocated for the following year, by 1 December each year. 	<p>The annual tag allocation is as reported in the '2023 December monthly total', on the KMP web pages. Annual harvest data are included in this annual report rather than separately reported. The 2024 quota report was provided to the Australian Government on time.</p>
	<p>3. The annual report on the operation of the plan will include as a minimum the following information:</p> <ul style="list-style-type: none"> a. actual harvest, by commercial harvest zone and species, compared with available quotas b. any special quota used c. gender bias and average weights for each species in each commercial harvest zone d. non-commercial cull allocation statistics within the commercial harvest zones e. compliance statistics including: <ul style="list-style-type: none"> o premises inspected 	<p>Completed. As reported in this annual report.</p>

Action	Performance indicator	Performance in 2023
	<ul style="list-style-type: none"> ○ penalty infringement notices issued and reasons for the issue ○ prosecutions <p>f. any unusual situations affecting the commercial harvest (e.g. disease outbreaks, drought conditions, market factors)</p> <p>g. any research on kangaroos supported by the department</p> <p>h. progress against performance indicators.</p>	
Action 7.2: Review of the Wildlife Trade Management Plan for the Commercial Harvest of Kangaroos in New South Wales 2022–26	1. The department will commence review of this plan at least 12 months before its expiry and resubmit for public exhibition and assessment by the Australian Government before approval by the Commonwealth Minister for the Environment in the timeframe prescribed by the Commonwealth department.	N/A at this stage.