



DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

NSW Commercial Kangaroo Harvest Management Plan: 2019 Annual Report

New South Wales Commercial Kangaroo Harvest Management Plan
2017-21



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Introduction

The NSW Department of Planning, Industry and Environment (the Department) and its predecessor organisations, has been researching, monitoring and managing the commercial harvest of kangaroos in New South Wales since the 1970s. During this period, a sequence of kangaroo management plans has provided the framework for harvesting kangaroos, in accordance with legislative requirements.

In December 2016 the Commonwealth Government declared the *New South Wales Commercial Kangaroo Harvest Management Plan 2017–21* to be an approved wildlife trade management plan for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999*. This Plan sets the framework for the commercial harvest of kangaroos in New South Wales following the expiry on 31 December 2016 of the *New South Wales Commercial Kangaroo Harvest Management Plan 2012–16*.

This report gives details of the operation of the *New South Wales Commercial Kangaroo Harvest Management Plan 2017–21* in its third year (2019), as required by Performance Indicator 14b of the plan. Appendix A describes each performance indicator and the progress made against it during 2019.

The following information is presented:

- actual harvest, by zone and species, compared with the approved quotas
- details of any special quota used (see page 8 for an explanation of special quotas)
- harvest sex bias for each species in each zone
- average carcase 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/enforcement activities completed
- any unusual situations that arose (e.g. 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 2019 NSW Kangaroo Quota Report, available from the [Kangaroo Management Program \(KMP\) webpage](#).

Actual harvest in 2019, by zone and species

Table 1 summarises the 2019 harvest for each management zone, across all species combined. Data includes the commercial take as a percentage of the approved quota (%q) and the commercial take as a percentage of the population estimate (%p). The average carcase weight in kilograms (Ave. wt) of harvested females (F) and males (M) is also shown.

Table 1 Harvest by zone for all species combined during 2019.

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

Management Zone	Population (p)	Quota (q)	Harvest	%p	%q	% take male	Av. wt (F)	Av. wt (M)
Tibooburra - 01	528,620	27,600	0	0.00	0.00	0.00	0.00	0.00
Broken Hill - 02	1,528,882	252,003	74,367	4.86	29.51	76.64	18.06	24.56
Lower Darling - 04	588,654	94,450	33,988	5.77	35.99	80.16	17.38	25.11
Cobar - 06	126,124	0	0	0.00	0.00	0.00	0.00	0.00
Bourke - 07	428,637	69,189	15,964	3.72	23.07	76.72	17.71	23.64
Narrabri - 08	1,082,586	168,570	67,057	6.19	39.78	71.48	18.10	25.77
Armidale - 09	493,400	74,010	37,745	7.65	51.00	74.08	19.17	29.26
Coonabarabran - 10	1,492,555	223,506	125,783	8.43	56.28	82.34	18.08	25.58
Griffith - 11	1,204,135	186,318	106,762	8.87	57.30	77.47	19.33	28.33
Glen Innes - 13	642,300	96,345	32,137	5.00	33.36	80.58	18.77	27.20
Upper Hunter - 14	333,000	49,950	34,181	10.26	68.43	81.15	19.69	28.85
Southeast NSW - 16	1,721,400	258,210	30,977	1.80	12.00	68.68	20.56	33.84
Central Tablelands North - 48	1,728,200	259,230	42,879	2.48	16.54	77.26	19.11	29.78
Central Tablelands South - 49	933,900	140,085	23,401	2.51	16.70	84.00	20.02	29.48
Total	12,832,393	1,899,466	625,241	4.87	32.92	77.79	18.68	27.13

Table 2 lists the details of the 2019 harvest by zone and species. Data includes the commercial take as a percentage of the approved quota (%q) and the commercial take as a percentage of the population estimate (%p). The average carcass weight in kilograms (Ave. wt) of harvested females (F) and males (M) is also shown.

Table 2 Harvest by zone and species during 2019

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

Species	Population (p)	Quota (q)	Harvest	%p	%q	% take male	Av. wt (F)	Av. wt (M)
Eastern Grey								
Tibooburra - 01	146,599	21,990	0	0.00	0.00	0.00	0.00	0.00
Broken Hill - 02	164,892	24,734	1,208	0.73	4.88	75.98	17.46	25.19
Lower Darling - 04	87,961	13,194	8,293	9.43	62.85	91.56	19.22	26.66
Cobar - 06	33,891	0	0	0.00	0.00	0.00	0.00	0.00
Bourke - 07	113,742	17,061	2,104	1.85	12.33	81.10	17.33	23.04
Narrabri - 08	723,343	108,501	49,257	6.81	45.40	71.02	17.89	24.57
Armidale - 09	420,800	63,120	33,820	8.04	53.58	71.15	19.20	29.92
Coonabarabran - 10	1,179,380	176,907	102,454	8.69	57.91	82.01	17.99	25.10
Griffith - 11	762,197	114,330	76,723	10.07	67.11	77.66	19.45	28.77
Glen Innes - 13	587,400	88,110	26,931	4.58	30.57	76.85	18.76	28.09
Upper Hunter - 14	259,600	38,940	27,544	10.61	70.73	76.70	19.68	29.75
Southeast NSW - 16	1,721,400	258,210	30,977	1.80	12.00	68.68	20.56	33.84
Central Tablelands North - 48	1,728,200	259,230	42,879	2.48	16.54	77.26	19.11	29.78
Central Tablelands South - 49	933,900	140,085	23,401	2.51	16.70	84.00	20.02	29.48
Total	8,863,305	1,324,412	425,591	4.80	32.13	77.25	18.84	27.64
Red								
Tibooburra - 01	344,619	0	0	0.00	0.00	0.00	0.00	0.00
Broken Hill - 02	1,133,523	192,699	66,690	5.88	34.61	76.94	18.25	24.58
Lower Darling - 04	307,619	52,295	19,150	6.23	36.62	77.60	17.30	25.18
Cobar - 06	44,733	0	0	0.00	0.00	0.00	0.00	0.00
Bourke - 07	244,687	41,597	13,661	5.58	32.84	75.76	17.85	24.04
Narrabri - 08	353,348	60,069	17,800	5.04	29.63	72.73	18.54	27.65
Coonabarabran - 10	218,312	37,113	22,291	10.21	60.06	83.27	18.37	26.72
Griffith - 11	284,853	48,425	25,521	8.96	52.70	76.24	19.27	28.54
Total	2,931,694	432,198	165,113	5.63	38.20	77.21	18.43	26.58
Walleroo								
Armidale - 09	72,600	10,890	3,925	5.41	36.04	99.39	16.67	28.12
Glen Innes - 13	54,900	8,235	5,206	9.48	63.22	99.94	22.33	25.90
Upper Hunter - 14	73,400	11,010	6,637	9.04	60.28	99.76	20.85	27.89
Total	200,900	30,135	15,768	7.85	52.32	99.73	17.63	27.36
Western Grey								
Tibooburra - 01	37,402	5,610	0	0.00	0.00	0.00	0.00	0.00
Broken Hill - 02	230,467	34,570	6,469	2.81	18.71	73.69	17.71	24.37
Lower Darling - 04	193,074	28,961	6,545	3.39	22.60	73.17	16.70	23.93
Cobar - 06	47,500	0	0	0.00	0.00	0.00	0.00	0.00
Bourke - 07	70,208	10,531	199	0.28	1.89	96.48	16.80	22.59
Narrabri - 08	5,895	0	0	0.00	0.00	0.00	0.00	0.00
Coonabarabran - 10	94,863	9,486	1,038	1.09	10.94	94.70	16.51	22.13
Griffith - 11	157,085	23,563	4,518	2.88	19.17	81.06	18.61	26.00
Total	836,494	112,721	18,769	2.24	16.65	76.69	17.65	24.51
Total	12,832,393	1,899,466	625,241	4.87	32.92	77.79	18.68	27.13

Special quota

A special quota endorsed by the Commonwealth Government in 2012 as part of the overall commercial quota was potentially available to minimise the number of kangaroos shot under non-commercial licences.

The Department may use the special quota only when the commercial quota for a particular kangaroo management zone has been fully issued. As specified in the New South Wales Commercial Kangaroo Harvest Management Plan 2017–21, the use of a special quota will depend on one or more of the following:

- full utilisation of a commercial quota set at the usual proportion for that species in that zone
- consideration of local conditions, including drought declarations and/or Western Lands de-stocking orders
- kangaroo population trends (based on the most recent complete surveys)
- climatic conditions during the quota year.

Non-commercial culling occurs outside of the available commercial quota and is typically less than 10% of the commercial harvest.

The special quota was not utilised during 2019.

Sex bias by species and zone

The commercial harvest is typically biased towards males, as they tend to be larger and heavier than females. For the period 1999 to 2019 inclusive, the total harvest consisted of between 71.15% and 91.34% males (Figure 1). Data gathered from harvester returns throughout 2019 indicated that 77.79% of the harvest overall was male; this is higher than the long-term average of 74.3%. Minimum carcase weights were introduced as licence conditions in September 2003, leading to a slight increase in male bias due to sexual dimorphism in all harvested species.

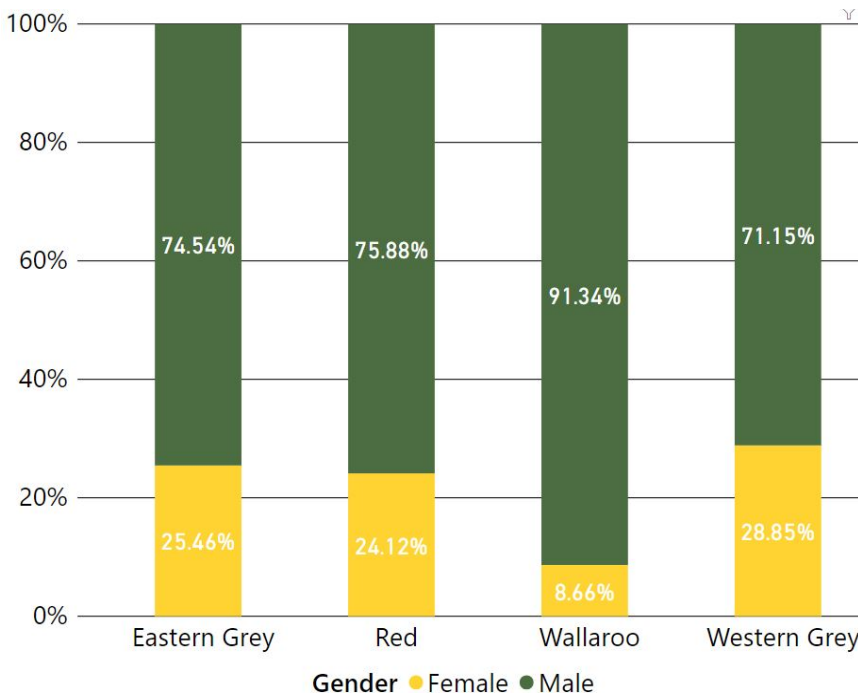


Figure 1 Average sex bias per species in the commercial harvest, 1999–2019

Harvesting is biased toward male animals because they are larger, heavier and provide better return in a price per kilogram economy. In addition, the Kangaroo Industry Association Australia introduced a policy to accept only male carcasses in October 2012 as a response to customer concerns regarding the fate of dependent young euthanised or orphaned by females being harvested. As a result, the proportion of males in the harvest increased during the final quarter of 2012 and continued to increase through 2018, until the industry-led policy was revoked. Figures 2, 3 and 4 show male bias for all species approved for harvesting.

Male bias is higher in the commercial take for common wallaroo *Macropus robustus* (Figure 2) than in other species (Figures 3; 4; 5) because of the more pronounced size difference between males and females. Female wallaroos rarely reach the minimum carcass weight requirements in the conditions attached to harvester and animal dealer licences. This has particularly been the case since 2008, when minimum carcass weights were increased by two kilograms over the previous standards.

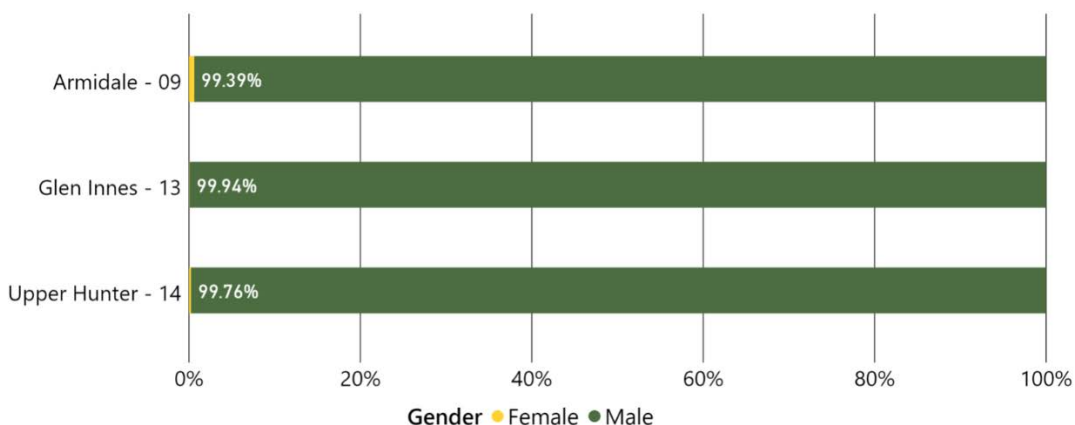


Figure 2 Wallaroo sex bias in the commercial harvest, 2019

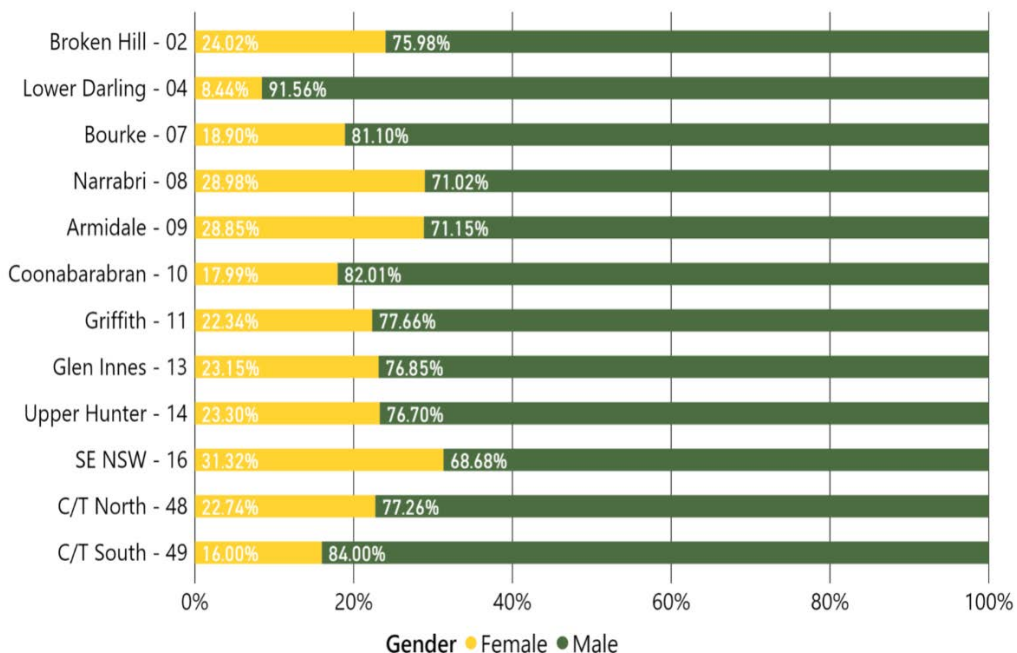


Figure 3 Eastern grey kangaroo sex bias in the commercial harvest, 2019

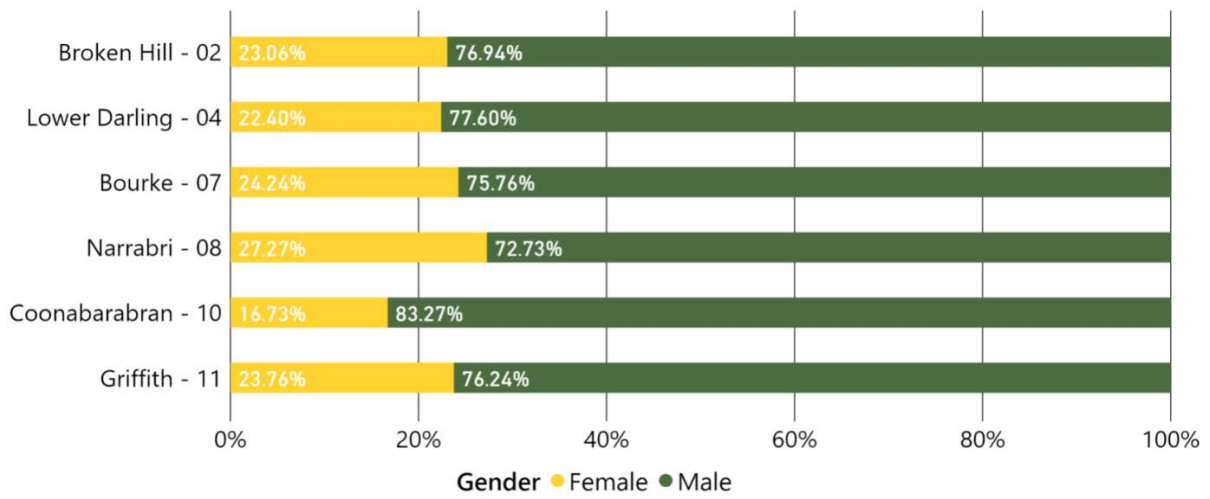


Figure 4 Red kangaroo sex bias in the commercial harvest, 2019

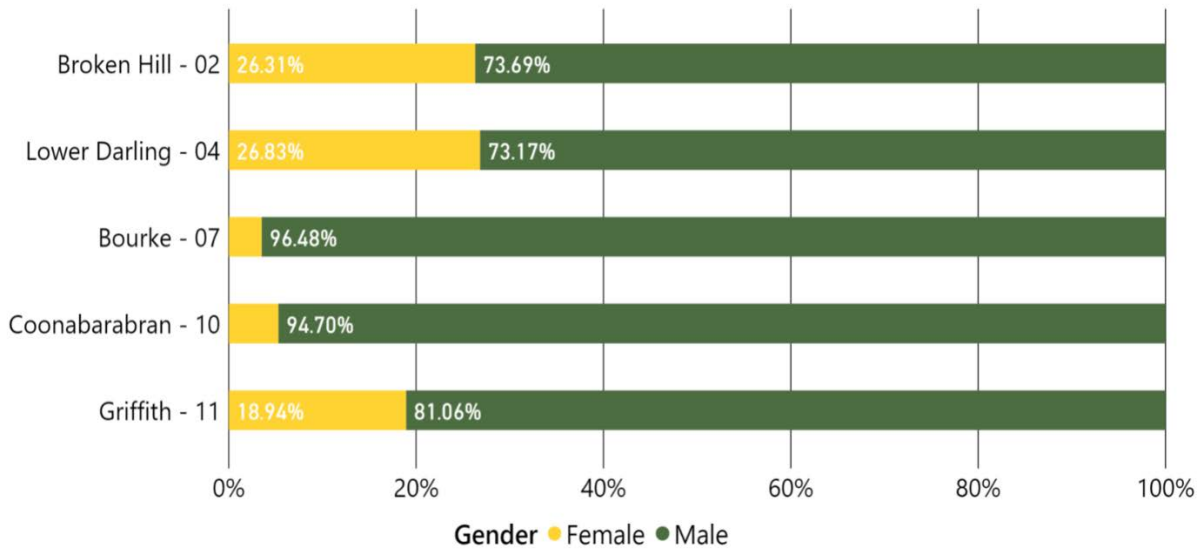


Figure 5 Western grey kangaroo sex bias in the commercial harvest, 2019

Average weights by species and zone

During 2019, commercial harvest licence conditions required that kangaroo carcasses delivered to chillers for sale were not to weigh less than 14 or 15 kilograms (the two different values reflect differences in the way the carcasses are dressed). Before 1 January 2008, the minimum carcass weights were 12 and 13 kilograms dressed and undressed, respectively. Above these minimum weights, a wide range of weights are consigned by harvesters.

The long-term average carcass weights by sex and species (across all zones) are shown in Figure 6. Data collected from harvester returns during 2019 indicated average carcass weight across all species was 27.13 kilograms for males and 18.68 kilograms for females; 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.

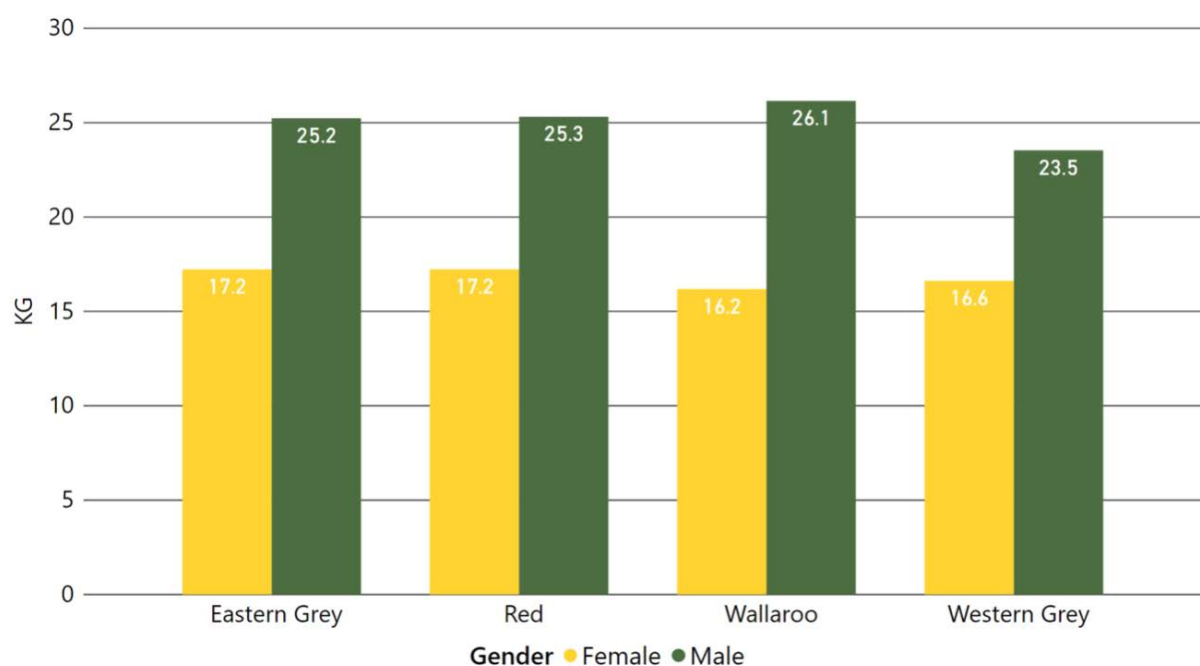


Figure 6 Average weights of carcasses in the commercial harvest, 1999–2019
Minimum carcass weights were introduced as licence conditions in September 2003. They increased by two kilograms from 1 January 2008, leading to a slight increase in the long-term average.

The Department does not require licensees to record individual carcass weights. Instead, harvester returns provide total weights for each category of carcasses (e.g. mean weight of female eastern grey kangaroos = total weight of female eastern grey kangaroos divided by the number of female eastern grey kangaroos). These totals are used to calculate the average weights of carcasses by sex, species and zone (Figures 7–13).

Average carcass weights were calculated monthly and compared with the long-term average (1999–2019) for each sex, species and zone, as required by Performance Indicator 12b of the plan. None of the 2019 monthly results were more than one standard deviation below the long-term average. Standard deviations ranged from 3.3 kilograms for eastern grey females in the Armidale zone to 7.3 kilograms for red males in the Narrabri zone, reflecting the degree of variation in the size of animals taken and the relative sample sizes.

For most combinations of species, sex 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 sexes, species and zones. For instance, the total harvest of female

wallaroos during 2019 was just 30 individuals, whereas the harvest of male red kangaroos was about 98,959.

Where large fluctuations occur, the sample size is usually very small and statistical reliability is low. This variation is a result of statistical processes and is not a reflection of changes in the kangaroo population. Weights do not vary significantly where larger samples are available (e.g. in the case of male eastern grey kangaroos in the Coonabarabran zone, represented in Figure 8).

In the charts that follow, there are a number of months in which no animals of a given sex or species were shot in a particular zone; this results in missing columns in the charts. For example, in Figure 7 there were no female eastern grey kangaroos shot in the Southeast zone from January to March.

During routine inspections of chiller premises and processing works, a selection of smaller animals are 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.

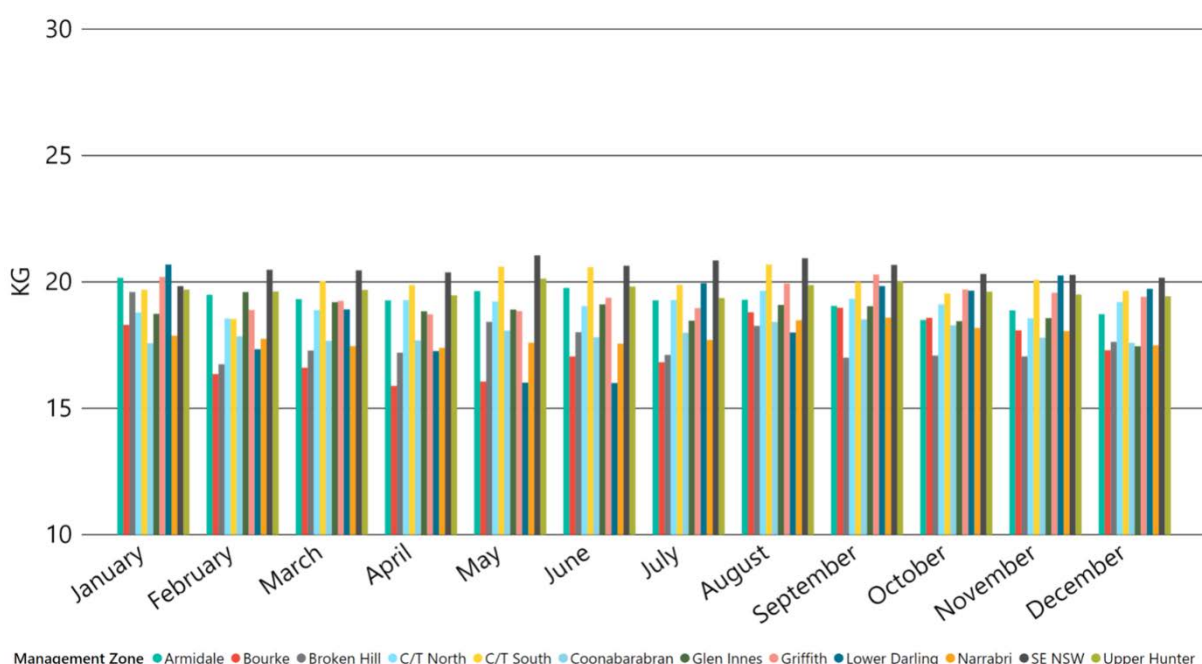


Figure 7 Eastern grey kangaroo female average carcass weights in the commercial harvest, 2019

Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages. Large fluctuations are usually associated with small numbers of animals.

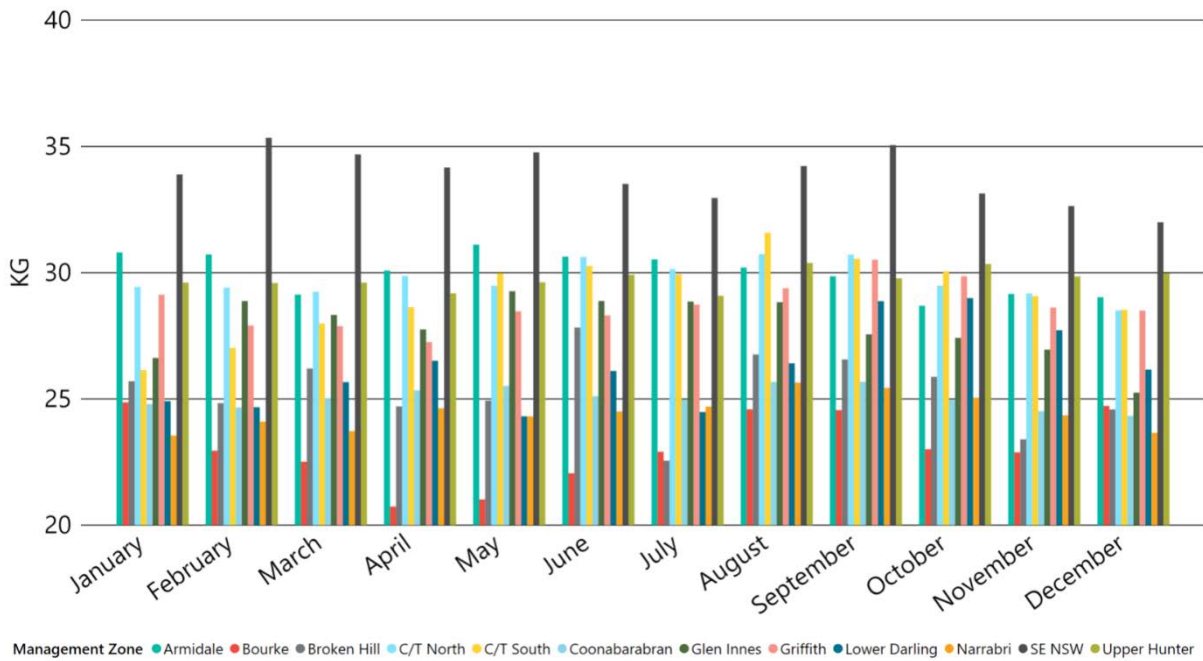


Figure 8 Eastern grey kangaroo male average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages.

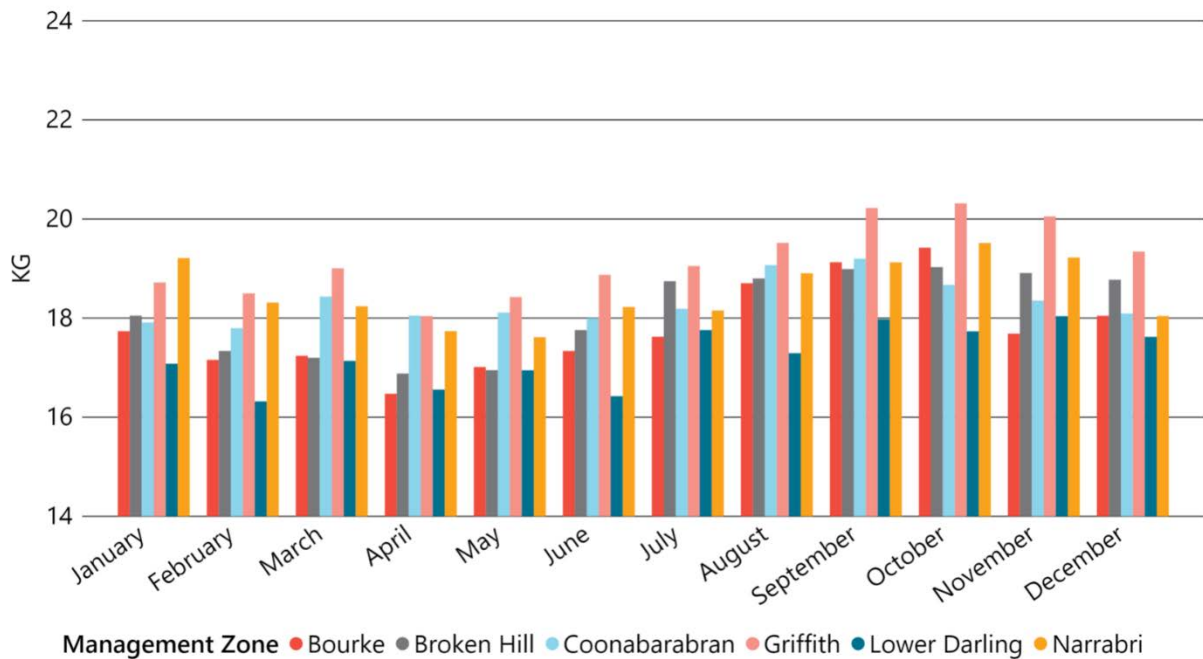


Figure 9 Red kangaroo female average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages. The large variation in carcass weights for red kangaroo females reflects the relatively small harvest compared with the number of males (about 25,000 compared with over 98,900).

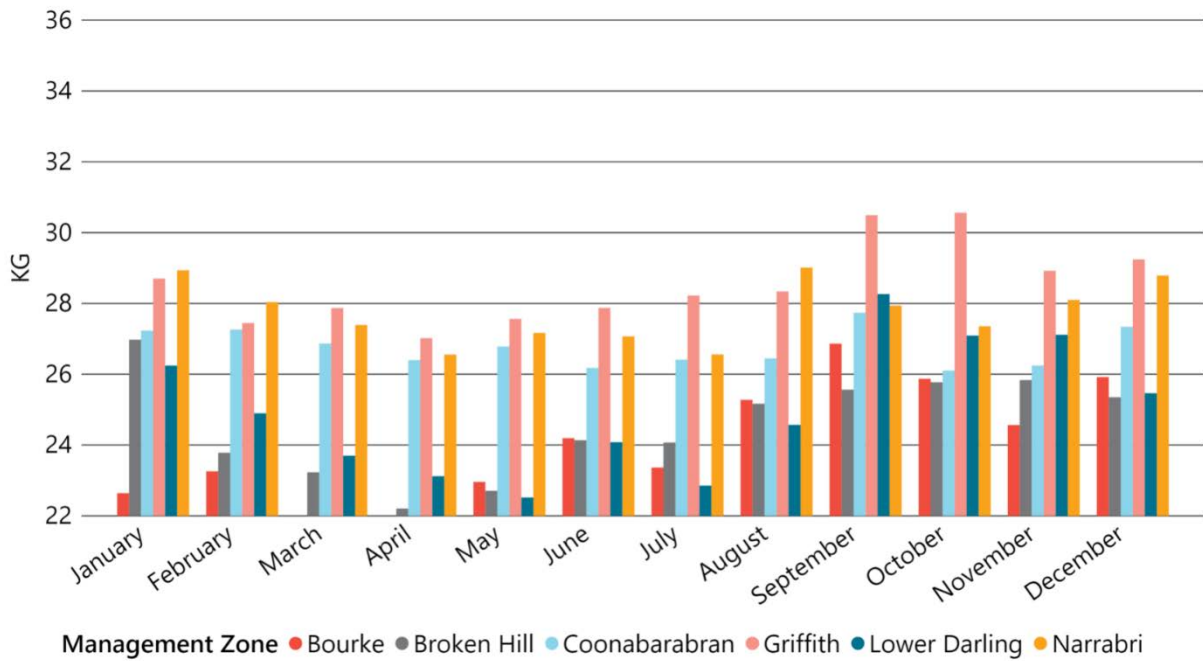


Figure 10 Red kangaroo male average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages.

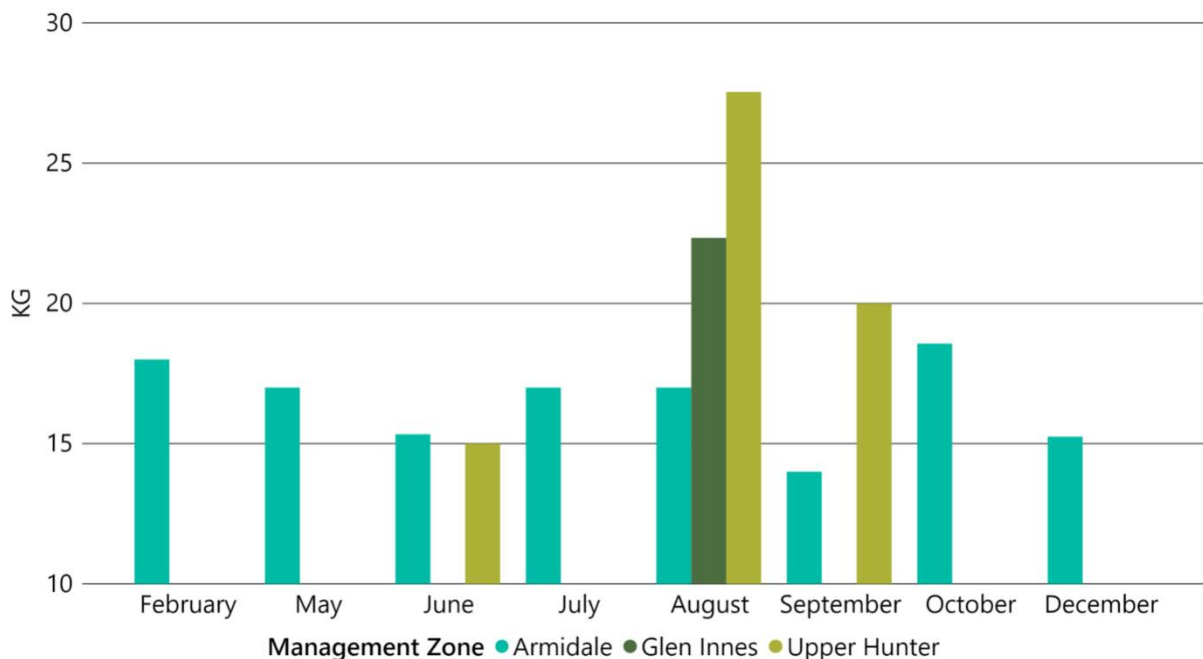


Figure 11 Wallaroo female average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages. The apparent fluctuation is the result of extremely small sample sizes: the total harvest for wallaroo females was only 30.

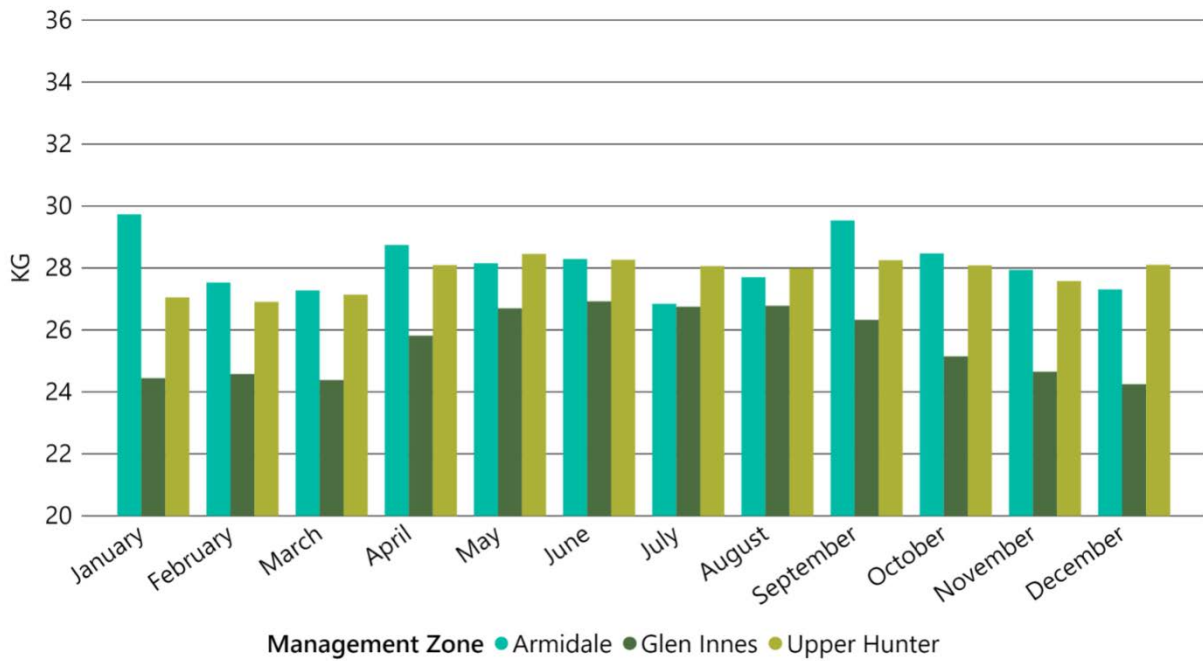


Figure 12 Wallaroo male average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages.

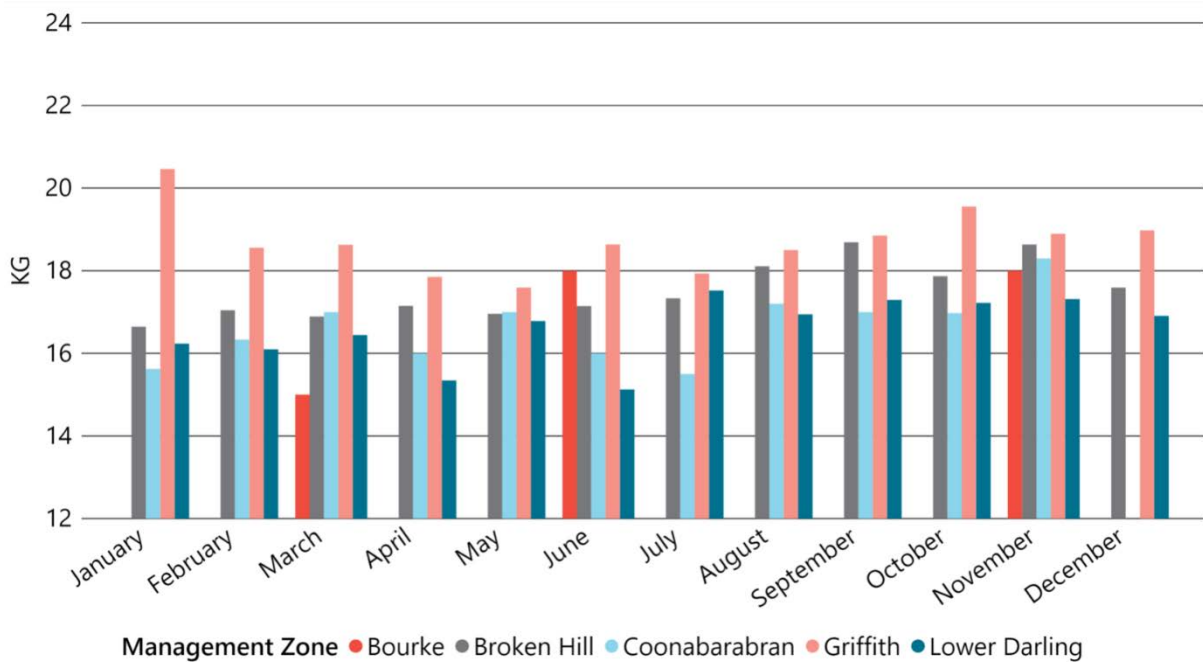


Figure 13 Western grey kangaroo female average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages. The total take of female western grey kangaroos in 2019 was about 2998 animals.

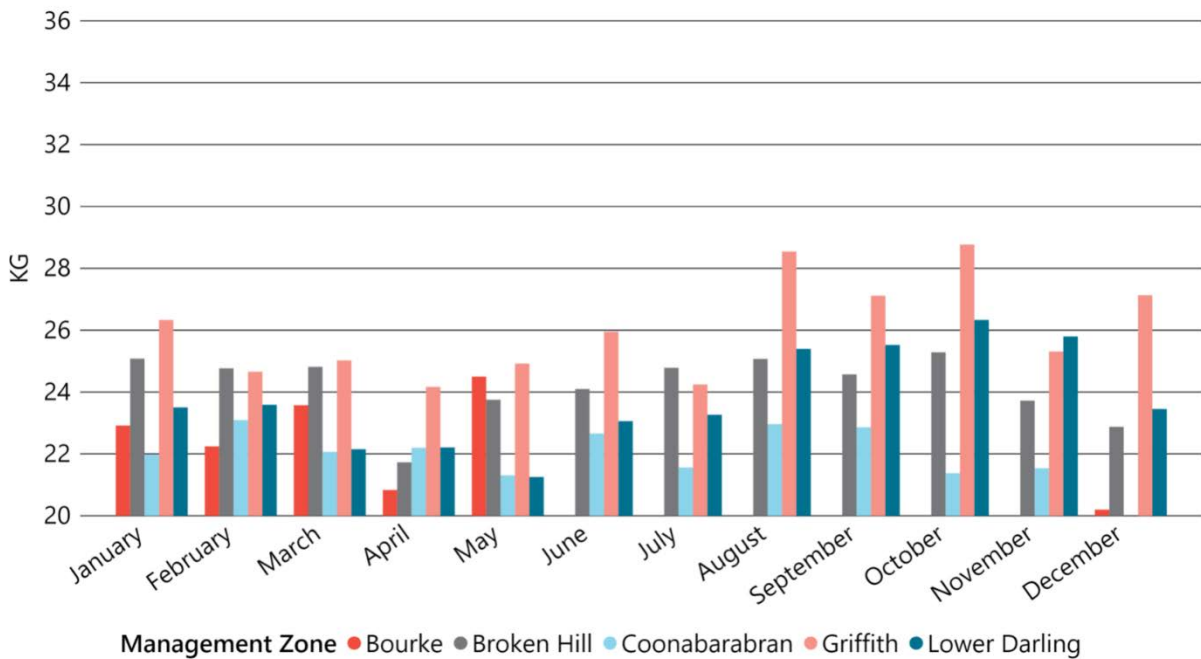


Figure 14 Western grey kangaroo male average carcass weights in the commercial harvest, 2019
 Minimum carcass weights were introduced as licence conditions in September 2003 and increased by two kilograms from 1 January 2008. Current carcass weights are therefore generally higher than the long-term averages.

Non-commercial culling within the commercial harvest zones

Non-commercial licences are available statewide and can be issued for properties where commercial harvesting is also undertaken. The non-commercial take is highest in those areas where high-value pastures and winter crops are important.

In 2019, 415,152 kangaroos were reported as culled under non-commercial licences, equivalent to 62.2% of the actual commercial harvest, or 21.9% of the available commercial quota. Non-commercial allocation for culling was higher than the commercial harvest in Southeast zone and Central Tablelands South harvest management zones, indicating that there is a substantial reliance on non-commercial culling for kangaroo management.

Non-commercial culling allocation figures are not comparable with commercial harvest take figures, given that returns for animals culled are not always submitted to the local National Parks and Wildlife Service (NPWS) Area Office.

Monitoring compliance in the commercial harvest zones

Compliance audits

During 2019 there were 502 licensed commercial harvesters with approximately 2988 approved landholder consents (some properties may have provided consent to multiple harvesters) for

commercial harvesting, 121 registered chiller premises, 18 licensed animal dealers and four licensed skin dealers throughout the commercial harvest zone.

Compliance audits of licensees are performed continuously by compliance officers in the Department, including monitoring by NSW Food Authority, firearms licensing audits by NSW Police and field inspections by Departmental regional compliance and regulation officers. Regional compliance and regulation officers inspect carcasses, harvesters, chiller premises and processors for compliance with licence conditions. Licensing staff contributed to compliance activities by scrutinising applications, compiling reports and reporting suspect activities and irregularities to regional compliance officers.

In addition to these activities, compliance staff investigate reports of illegal shooting activities to the fullest extent possible. During 2019, reports of illegal shooting were received, either 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 in fact licensed.

Surveillance activities were conducted during 2019 with NSW Police to investigate firearms issues and to inspect allegations of illegal activities reported to the Department.

Reports involving matters related to food safety were referred to the NSW Food Authority in accordance with the memorandum of understanding between the Department and NSW Food Authority. Activities involving non-commercial shooting were referred to the relevant NPWS Office.

Information to help enforce the relevant sections of the NSW *Biodiversity Conservation Act 2016* (BC Act) is shared with NSW Police, NSW Food Authority, the Australian Department of Agriculture and Water Resources and interstate fauna protection agencies as required, within the boundaries of NSW privacy legislation.

Inspections of premises

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

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

Harvester vehicles can be checked opportunistically for:

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

Harvesters are also checked to ensure they are carrying a Professional Kangaroo Harvester's Licence or Landholder Kangaroo Harvesters licence authorised under the BC Act.

During 2019, there were 121 chiller premises registered by animal dealer wholesalers including seven registered by harvesters and one by a skin dealer. All chillers were inspected at least once throughout the year and 27 inspections of processing works were conducted by the Department and a further 61 audits conducted by NSW Food Authority. All chillers were registered throughout the year.

In addition to routine chiller inspections, regional compliance officers investigated instances of non-head-shot kangaroo carcasses originating in NSW and reported by animal dealers.

Penalty infringement notices

Issuing of verbal cautions, written warnings or infringement notices is at the discretion of the regional compliance officer, in accordance with the compliance policy. A total of 124 matters were investigated by compliance teams. Although cautions do not attract penalties, they are recorded and taken into account in any future compliance considerations and risk assessment procedures. Table 3 summarises the compliance response outputs for 2019.

Table 3 2019 compliance outputs

	Advisory letter	Official caution	Warning letter	Penalty infringement notice	Total
Underweight carcass		2	1	2	5
Non-head shot	1	13	7	13	34
Breach of licence conditions	2		1	1	4
Incorrect display on chiller			4		4
Total	3	15	13	16	47

Licence cancellations

The Department did not cancel any licences or registrations during 2019.

Prosecutions

There were no prosecutions in 2019. One investigation conducted throughout 2019 is scheduled for court hearing during 2020 and prosecution action may result for identified offences committed.

Other factors affecting the commercial harvest in 2019

There were no reduced quotas set for population estimates for any commercial zone in 2019.

The industry has been increasing activity since 2016. Total harvested kangaroos per year were 293,271 (2016), 375,899 (2017), 593,796 (2018) and 625,241 (2019). Whilst international export markets remained limited for kangaroo product throughout 2018 and 2019, the industry's capacity to utilise the full commercial quota was not achieved.

Since the cap on historical Fauna Dealer Licences was lifted in March 2018, the 11 licences held by seven companies has increased to 18 licences held by 18 companies. This is reflected in increasing numbers of registered chiller premises and licensed harvesters. In addition, some processors are offering \$1.10-\$1.20 per kilogram. Historical harvest rates show there is generally increased harvesting around drought periods. This may be a response from landowners seeking to increase kangaroo harvesting to decrease competition with livestock for water and food resources. The Kangaroo Industry Association Australia removed the male-only harvest policy in 2018. As a result, harvesters can be less selective of animals targeted. The combination of these impacts resulted in only 32.92.% of the available quota being utilised (about 4.87% of the estimated population).

Research involvement in 2019

Apart from annual population surveys, no research projects were completed by KMP in 2019.

Appendix A: Progress against performance indicators in 2019

Management action and method	Performance indicators	Progress in 2019
Objective 1: To ensure animals are harvested or euthanised using humane methods		
<p>Implement the <i>National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes</i> across all harvesting activity.</p> <p>Method</p> <p>Monitor requirements including:</p> <ul style="list-style-type: none"> • firearms licence • accreditation under national code of practice • competency in firearms accuracy • self-reporting of non-compliance • risk-based approach to auditing compliance. 	<p>1. Implementation indicators:</p> <p>a. 100% of licence holders have met shooter competency standards</p> <p>b. reports received from chiller operators weekly</p> <p>c. results of weekly reports assessed for any non-compliances</p> <p>d. compliance response taken for identified non-compliances proportionate to the risk to program objectives.</p>	<p>a. complete</p> <p>b. complete</p> <p>c. ongoing and all results reported</p> <p>d. all non-compliances reported to compliance teams for appropriate action.</p>
<p>Reports through the memorandum of understanding with the Commonwealth Department of Agriculture and Water Resources Meat Exports Branch.</p> <p>Method</p> <p>Department inspects kangaroo carcasses before being exported.</p>	<p>2. The Department reports non-compliance events annually and applies risk assessment to reported breaches. Regional compliance branches monitor reports and responds consistent within its compliance framework.</p>	<p>Breaches are managed in accordance with the Department Compliance Policy.</p>
<p>Department inspects kangaroo carcasses in chiller premises while performing routine chiller inspections.</p>	<p>3. The Department reports non-compliance events annually and applies risk assessment to reported breaches and reports breaches to the NSW Food.</p>	<p>All non-compliance incidents are reported and assessed under the risk framework. In accordance with the Memorandum of Understanding (MOU), all NSW Food offences are reported to the Authority.</p>
<p>Non-compliance reports received through NSW Enviro-line.</p> <p>Method</p> <p>Breaches reported to the Department are prioritised and assessed using a risk management assessment tool.</p>	<p>4. The Department reports non-compliance events annually and applies risk assessment to reported breaches.</p>	<p>All Enviro-line reports are recorded on the compliance case management system, risked assessed and managed by the relevant compliance team.</p>

Management action and method	Performance indicators	Progress in 2019
Self-reporting from industry professionals. Method Apply risk assessment methods.	5. Reports received are prioritised using the Regional Operations Compliance Risk Assessment Framework and investigated.	All reports are recorded in the compliance case management system, risk assessed and managed by the relevant compliance team.
Inspect each chiller premises once per year. Method Routine inspections consistent with Department safety protocol.	6. Inspections and breaches reported annually.	Job Safety Assessments (JSAs) and Job Safety Briefings (JSBs) reviewed and implemented for inspections. All chillers were inspected at least once.
Inspect every processing plant three times per year. Method Routine inspections consistent with The Department safety protocol.	7. Inspections and breaches reported annually.	JSAs and JSBs reviewed and implemented for chiller and processing work inspections. All processing works in NSW were inspected during 2019.
Conduct two field audits of licensed harvesters per year. Method Routine inspections consistent with The Department safety protocol.	8. Inspections and breaches reported annually.	Harvester field audits were not conducted in 2019 due to work health and safety risks.
Objective 2: To ensure that the commercial harvest is ecologically sustainable		
Population monitoring. Method Annual aerial surveys.	9. 100% of surveys conducted by 30 November (annually or triennially as relevant).	Complete. In 2019 aerial surveys of Western Plains were conducted in June–July–August and population estimates were made available on the KMP webpage in February 2020. Helicopter survey of Northern Tablelands management zones completed in September.
Quota set each year as a percentage of kangaroo population. Method Quota percentage set for each species and calculated for each management zone based on population estimates.	10. Quotas commence at 1 January each year, and harvest does not exceed allocations as stated in quota reports.	Quotas commenced on 1 January 2019. Harvest did not exceed allocations in 2019.
Restriction of harvest area (no-harvest sanctuaries).	11. 100% of harvest returns specify the private land where the kangaroo was harvested.	Harvesting is only permitted on private land.

Management action and method	Performance indicators	Progress in 2019
<p>Method Harvesting is permitted only on private land.</p>		
<p>Risk assessment of species through harvest data.</p> <p>Method Analysis of kangaroo data from harvesters (weight, sex, number) per zone.</p>	<p>12.Data analysis indicators:</p> <ul style="list-style-type: none"> a. all required data captured b. all data analysed c. kangaroo populations statistics are compared against thresholds to measure whether kangaroo populations are within normal range d. action taken, including possible suspension of harvest, if population statistics show trends below thresholds. 	<ul style="list-style-type: none"> a. complete b. complete c. complete (refer to density estimate and threshold tables in 2019 Quota Report) d. Populations for red, western grey and eastern grey kangaroos showed trends below thresholds in Cobar zone and harvesting was suspended. In addition, quota for red kangaroos was suspended in Tibooburra zone as populations showed trends below thresholds.
<p>Maintenance of population within thresholds.</p> <p>Method Tags allocated in accordance with quotas only. Quarterly returns to monitor actual take against quota numbers.</p>	<p>13.Actual take and tag allocations are kept within quota allocations.</p>	<p>Monthly reports completed on take and allocation. Quota allocations were not exceeded during 2019.</p>
<p>Regular review and adaptive program management.</p> <p>Method Aspects of the harvest including population size, population trends, species health, and harvester compliance are reviewed annually against performance indicators. Relevant data are required to be submitted from harvesters and chiller operators. Data is analysed and compared against performance indicators. The harvest program is adjusted annually in accordance with population monitoring. The Kangaroo Management Plan is reviewed and re-submitted for assessment by the Commonwealth and public comment before</p>	<p>14.Review indicators:</p> <ul style="list-style-type: none"> a. 100% of harvester returns are received each quarter b. annual report prepared and submitted to the Commonwealth Department of the Environment and Energy, and published on the Department's kangaroo management webpage by 31 March each year c. Commercial Kangaroo Harvest Management Plan is reviewed in 2021 or as required, including in the event of legislative change. 	<ul style="list-style-type: none"> a. 100% of harvester returns were received each quarter during 2019 b. 2018 annual report completed and published on the Department's webpage c. ongoing.

Management action and method	Performance indicators	Progress in 2019
<p>approval by the Minister for the Environment and Energy at least 12 months before its expiry.</p> <p>Triggers to suspend the harvest if population declines, or if population health is declining.</p> <p>Method Reducing or ceasing the harvest as needed to maintain population sustainability and/or health (managed through the tag allocation system).</p>	<p>15.All relevant quotas suspended if populations are below thresholds.</p>	<p>Thresholds for each species in each commercial zone are reviewed and set for each year. Populations of all species fell below the thresholds in Cobar zone, and for red kangaroos in Tibooburra zone.</p>
<p>Implementation of a risk-based compliance program. Audit of compliance program undertaken periodically to ensure confidence in the program.</p> <p>Method The Department will implement proactive compliance, including analysing data and intelligence to apply a risk-based approach to compliance. The Department will assess reports of non-compliance and take a compliance response to confirmed non-compliances that is commensurate with the level of risk of the non-compliance. Audit team to periodically audit higher risk aspects of the program. Self-reporting of non-compliance is a licence condition for harvesters and chiller operators.</p>	<p>16.Compliance indicators:</p> <ul style="list-style-type: none"> a. all allegations of non-compliance assessed for risk to program objectives, and investigated as required b. all self-reports of non-compliance assessed for risk to program objectives and investigated as required c. at least one audit program undertaken in the period covered by this plan. 	<p>The compliance audit program commenced in late 2017 and was completed in 2019 for implementation and inclusion in adaptive risk management strategies in 2020.</p>
<p>Special kangaroo harvest quotas are set.</p> <p>Method Utilise in accordance with the provisions of the NSW Commercial Kangaroo Harvest Management Plan 2017–2021 (Section 5.2).</p>	<p>17.If special quota is utilised it will be reported in the annual report and quota report.</p>	<p>No special quota was used in 2019.</p>
<p>Department commitment: Engage with community and industry stakeholders to ensure the objectives of this plan are met</p>		
<p>Proactive engagement with community and industry stakeholders.</p> <p>Method</p>	<p>18.KMAP meetings at least twice a year.</p>	<p>KMAP meetings were held in March and November 2019.</p>

Management action and method	Performance indicators	Progress in 2019
<p>Engage with Kangaroo Management Advisory Panel (KMAP) members representing the range of stakeholder interests, to be appointed by the Coordinator-General, Environment, Energy and Science.</p> <p>Engage with KMAP on the preparation of the annual report and quota report, and other items as required.</p>		
<p>Provide regular up to date information on the Department's website.</p> <p>Method</p> <p>Maintain an active role in web-based and manual delivery of information.</p>	<p>19. Annual report and quota report uploaded to the kangaroo management webpage, and other relevant documents accessible as required.</p>	<p>2018 annual report and 2019 quota report were published to the Department's webpage in 2019. Monthly take and allocation reports were published to the Department's webpage during 2019.</p>