



# **2018 Annual Report**

New South Wales Commercial  
Kangaroo Harvest Management Plan  
2017–21

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# Introduction

The NSW Office of Environment and Heritage (OEH) (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 the harvest, 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 set 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 second year (2018), as required by Performance Indicator 14b of the plan. Appendix A describes each performance indicator and the progress made against it during 2018.

The following information is presented:

- actual harvest, by zone and species, compared with the approved quotas
- details of any special quota used (see page 4 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 OEH or sponsored by OEH.

Details of population survey methods, the results of aerial surveys and the setting of quotas are given in a separate report, namely the 2018 NSW Kangaroo Quota Report, available from the [Kangaroo Management Program \(KMP\) webpage](#).

## Actual harvest in 2018, by zone and species

Table 1 summarises the 2018 harvest for each management zone, across all species combined. '%q' is the commercial take as a percentage of the approved quota. '%p' is the commercial take as a percentage of the population estimate, and 'Ave. wt' is the average carcase weight in kilograms of harvested females (F) and males (M).

**Table 1 Harvest by zone for all species combined, 2018**

Management zone	No.	Population (p)	Quota (q)	Harvest	%q	%p	% take male	Av. wt (F)	Av. wt (M)
<b>All species</b>									
Tibooburra	1	1,311,589	219,419	18,436	8.4	1.4	97.8	17.2	26.9
Broken Hill	2	1,261,341	205,665	103,372	50.3	8.2	94.9	18.3	27.5
Lower Darling	4	501,859	81,067	39,349	48.5	7.8	83.9	17.0	26.2
Cobar	6	413,564	61,253	12,579	20.5	3.0	97.1	19.0	25.9
Bourke	7	683,369	111,745	34,392	30.8	5.0	96.5	17.9	26.0
Narrabri	8	1,230,979	199,864	65,707	32.9	5.3	79.3	17.7	26.7
Armidale	9	493,400	74,010	22,373	30.2	4.5	81.0	18.2	31.4
Coonabarabran	10	1,503,615	233,904	112,108	47.9	7.5	94.8	18.3	27.1
Griffith	11	2,082,085	328,702	80,180	24.4	3.9	85.9	19.5	29.8
Glen Innes	13	642,300	96,345	24,043	25.0	3.7	89.4	18.5	30.0
Upper Hunter	14	333,000	49,950	23,248	46.5	7.0	89.2	19.1	30.3
SE NSW	16	1,284,300	192,645	10,918	5.7	0.9	89.3	20.8	35.2
C/T North	48	1,728,200	259,230	23,400	9.0	1.4	82.9	19.0	31.3
C/T South	49	933,900	140,085	23,691	16.9	2.5	90.7	19.7	30.7
<b>Totals</b>		<b>14,403,501</b>	<b>2,253,884</b>	<b>593,796</b>	<b>26.3</b>	<b>4.1</b>	<b>90.0</b>	<b>18.4</b>	<b>28.2</b>

Table 2 lists the details of the 2018 harvest by zone and species. '%q' is the commercial take as a percentage of the approved quota. '%p' is the commercial take as a percentage of the population estimate, and 'Ave. wt' is the average carcase weight in kilograms of harvested females (F) and males (M).

**Table 2 Harvest by zone and species, 2018**

Management zone	No.	Population (p)	Quota (q)	Harvest	%q	%p	% take male	Av. wt (F)	Av. wt (M)
<b>Eastern kangaroo</b>									
Tibooburra	1	140,271	21,041	492	2.3	0.4	92.9	17.4	27.9
Broken Hill	2	182,731	27,410	6,075	22.2	3.3	94.0	18.5	26.3
Lower Darling	4	66,502	9,975	6,385	64.0	9.6	94.3	18.6	27.9
Cobar	6	76,645	11,497	5,206	45.3	6.8	97.3	18.1	25.9
Bourke	7	136,899	20,535	10,972	53.4	8.0	97.5	17.5	25.0

Management zone	No.	Population (p)	Quota (q)	Harvest	%q	%p	% take male	Av. wt (F)	Av. wt (M)
<b>Eastern kangaroo continued</b>									
Narrabri	8	442,522	66,378	50,692	76.4	11.5	77.8	17.6	26.1
Armidale	9	420,800	63,120	19,482	30.9	4.6	78.4	18.2	31.9
Coonabarabran	10	847,077	127,061	86,090	67.8	10.2	94.8	18.1	26.6
Griffith	11	1,046,879	157,032	43,508	27.7	4.2	85.3	19.9	30.3
Glen Innes	13	587,400	88,110	19,870	22.6	3.4	87.2	18.5	30.6
Upper Hunter	14	259,600	38,940	18,249	46.9	7.0	86.4	19.0	30.8
SE NSW	16	1,284,300	192,645	10,918	5.7	0.9	89.3	20.8	35.2
C/T North	48	1,728,200	259,230	23,400	9.0	1.4	82.9	19.0	31.3
C/T South	49	933,900	140,085	23,691	16.9	2.5	90.7	19.7	30.7
<b>Totals</b>		<b>8,153,726</b>	<b>1,223,059</b>	<b>325,030</b>	<b>26.6</b>	<b>4.0</b>	<b>88.0</b>	<b>18.6</b>	<b>28.6</b>
<b>Red kangaroo</b>									
Tibooburra	1	1,135,531	193,040	17,481	9.1	1.5	98.0	17.1	26.8
Broken Hill	2	823,210	139,946	82,792	59.2	10.1	95.4	18.2	27.6
Lower Darling	4	289,385	49,195	21,338	43.4	7.4	85.5	16.9	26.1
Cobar	6	229,495	39,014	4,424	11.3	1.9	97.3	18.7	26.6
Bourke	7	461,968	78,535	22,091	28.1	4.8	95.8	17.9	26.6
Narrabri	8	785,211	133,486	15,015	11.2	1.9	84.5	18.1	28.7
Coonabarabran	10	588,404	100,029	23,613	23.6	4.0	94.7	19.0	29.0
Griffith	11	819,450	139,307	28,556	20.5	3.5	86.7	18.9	29.9
<b>Totals</b>		<b>5,132,654</b>	<b>872,552</b>	<b>215,310</b>	<b>24.7</b>	<b>4.2</b>	<b>93.0</b>	<b>18.1</b>	<b>27.8</b>
<b>Wallaroo</b>									
Armidale	9	72,600	10,890	2,891	26.5	4.0	99.0	17.6	28.6
Glen Innes	13	54,900	8,235	4,173	50.7	7.6	99.6	21.8	27.6
Upper Hunter	14	73,400	11,010	4,999	45.4	6.8	99.3	27.8	28.7
<b>Totals</b>		<b>200,900</b>	<b>30,135</b>	<b>12,063</b>	<b>40.0</b>	<b>6.0</b>	<b>99.0</b>	<b>22.7</b>	<b>28.3</b>
<b>Western grey</b>									
Tibooburra	1	35,787	5,368	463	8.6	1.3	97.2	18.9	33.1
Broken Hill	2	255,400	38,310	14,505	37.9	5.7	95.5	19.4	29.1
Lower Darling	4	145,972	21,896	11,626	53.1	8.0	89.4	17.7	27.8
Cobar	6	107,424	10,742	2,949	27.5	2.7	99.8	16.3	26.7
Bourke	7	84,502	12,675	1,329	10.5	1.6	99.6	25.2	28.8
Narrabri	8	3,607							
Coonabarabran	10	68,134	6,813	2,405	35.3	3.5	97.9	18.8	24.1
Griffith	11	215,756	32,363	8,116	25.1	3.8	90.9	19.2	27.6
<b>Totals</b>		<b>916,582</b>	<b>128,167</b>	<b>41,393</b>	<b>32.3</b>	<b>4.5</b>	<b>93.0</b>	<b>18.6</b>	<b>28.0</b>

## 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.

OEH 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.

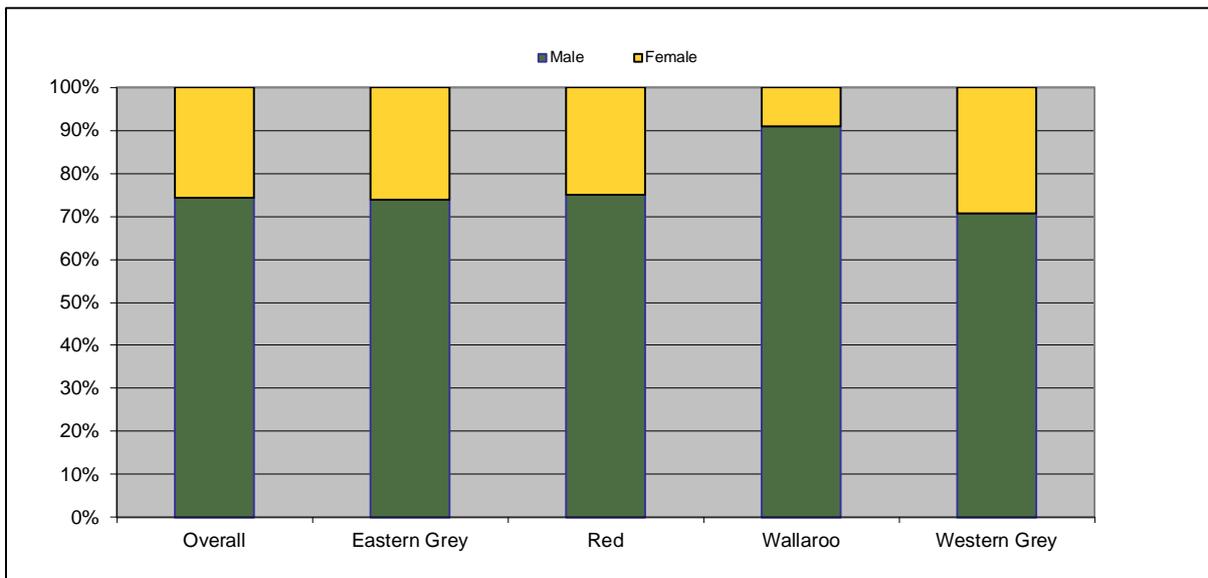
Non-commercial culling occurs outside of the available commercial quota and is typically less than 10% of the commercial harvest.

The special quota was not utilised during 2018.

## 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 2017 inclusive, the total harvest consisted of between 70.6% and 90.8% males (Figure 1). Data gathered from harvester returns throughout 2017 indicate that 95.1% of the harvest overall was male; this is higher than the long-term average of 74.3%.

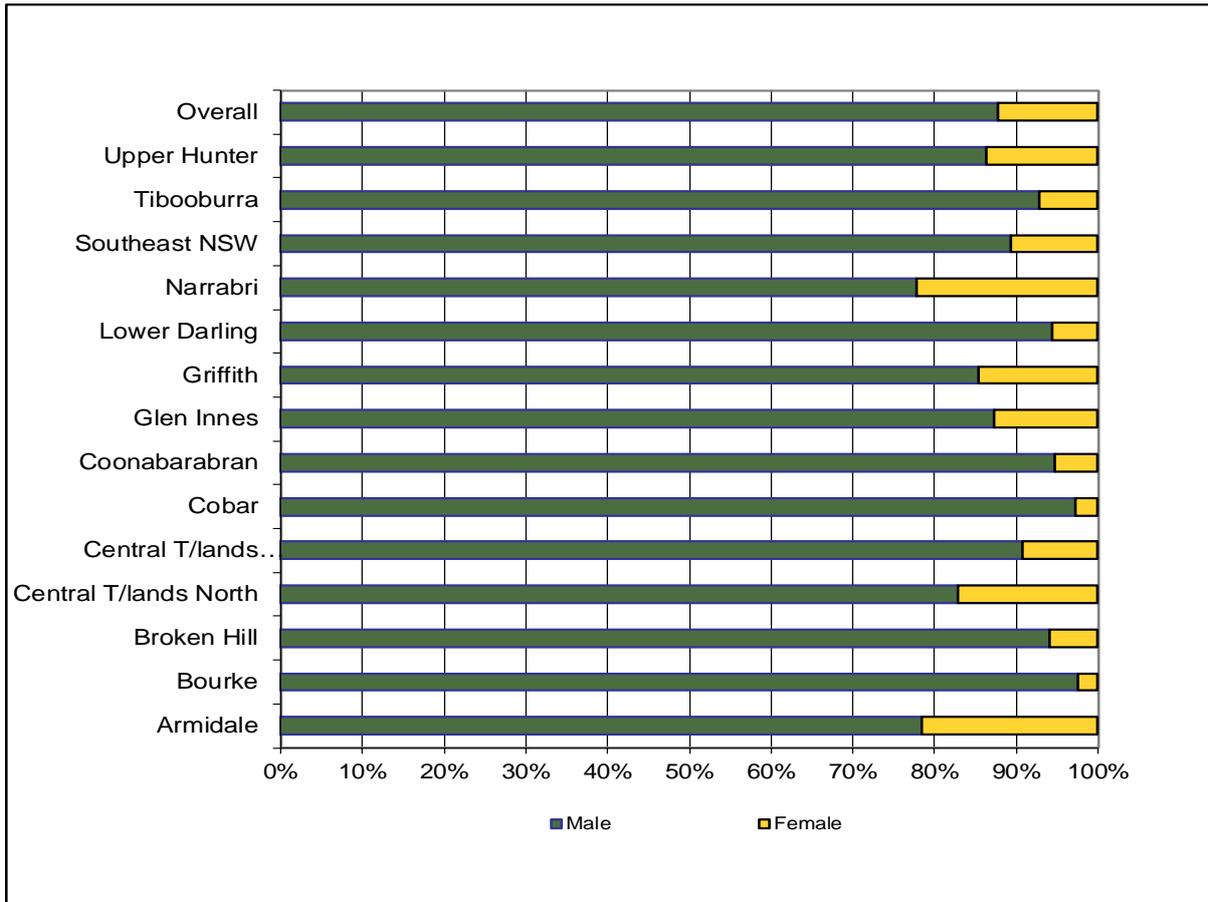
One processing company made the decision to accept only male carcasses from October 2012 onwards, in response to customer concerns regarding the fate of dependent young orphaned by the harvest. As a result, the proportion of males in the harvest increased during the final quarter of 2012 and has continued to increase through 2018.



**Figure 1 Average sex bias (overall and by species) in the commercial harvest, 1999–2017**

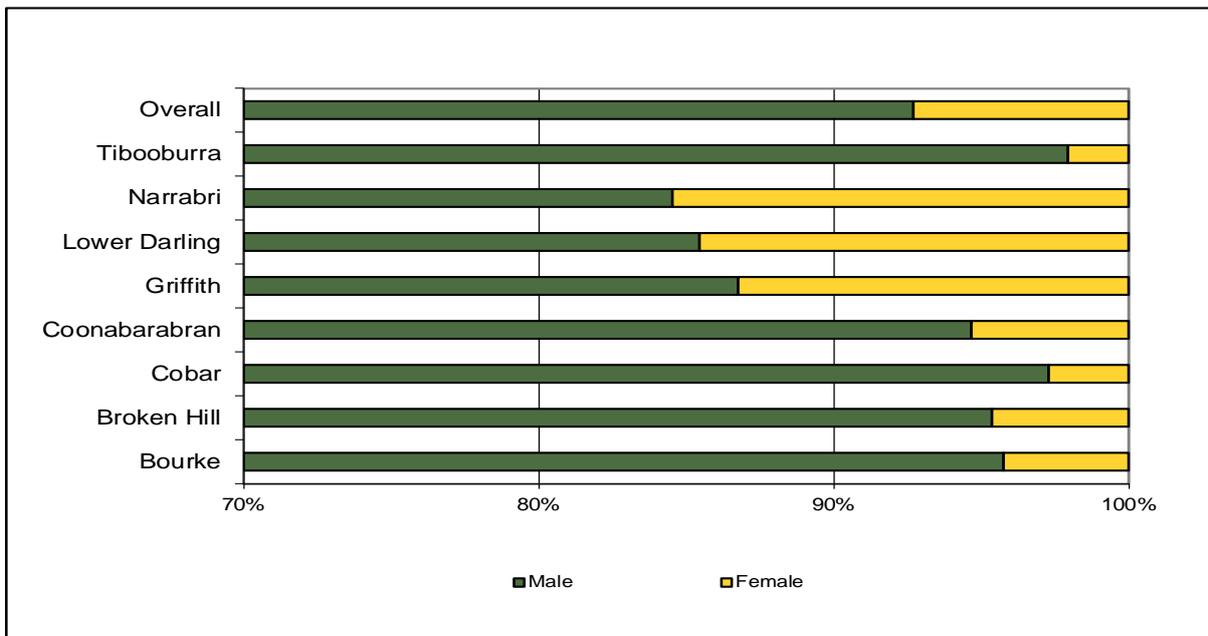
Male bias is higher in the wallaroo than in other species because of the more pronounced size difference between males and females. Minimum carcass weights were introduced as licence conditions in September 2003, leading to a slight increase in male bias due to sexual dimorphism in all harvested species.

More so than with the other harvested species (Figures 2, 3 and 5), for wallaroo (*Macropus robustus*) the commercial take (Figure 4) is very strongly biased towards males, because females rarely reach the minimum size dictated by 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.



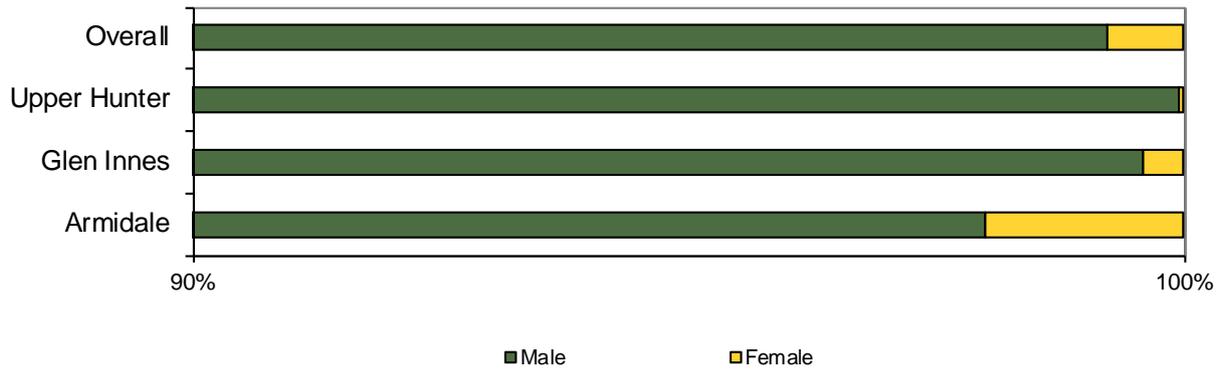
**Figure 2 Eastern grey kangaroo sex bias in the commercial harvest, 2018**

No consideration is given in this chart to the total harvest of this species in each zone; for example, the Tibooburra harvest was about 490 animals, compared with over 50,000 for the Narrabri zone.



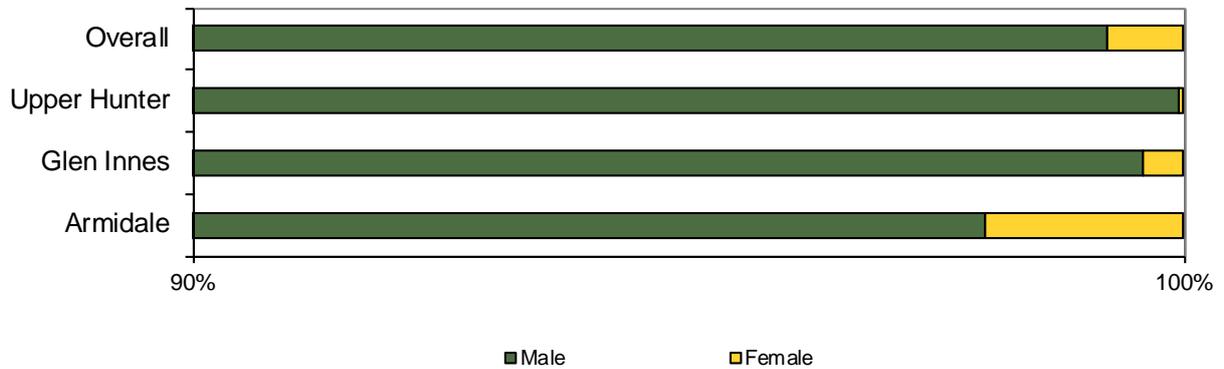
**Figure 3 Red kangaroo sex bias in the commercial harvest, 2018**

No consideration is given in this chart to the total harvest of this species in each zone; for example, the Cobar harvest was around 4400 animals, compared with over 80,000 for the Broken Hill zone.



**Figure 4 Wallaroo sex bias in the commercial harvest, 2018**

The total harvest of wallaroos was around 12,000 animals – about 6% of the total population for 2018. Male bias is very strong, because female wallaroos rarely reach the minimum size for commercial harvest.



**Figure 5 Western grey kangaroo sex bias in the commercial harvest, 2018**

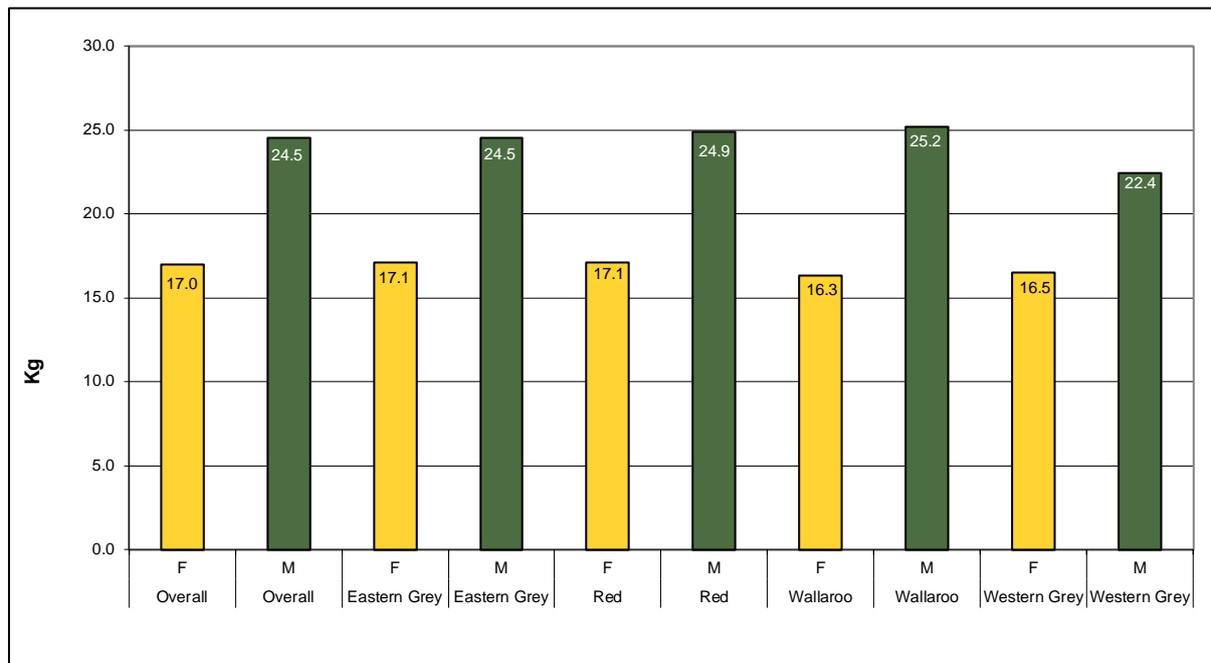
No consideration is given in this chart to the total harvest of this species in each zone; for example, the Coonabarabran harvest was about 2400 animals, and the total harvest of this species across zones was only about 38,000.

## Average weights by species and zone

During 2018, 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, respectively. Above these minimum weights, a wide range of weights is targeted.

The long-term average carcass weights by sex and species (across all zones) are shown in Figure 6. Data collected from harvester returns during 2018 indicate that average carcass weight across all species was 28.2 kilograms for males and 18.4 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.

OEH 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 females/number of females). These totals are used to calculate the average weights of carcasses by sex, species and zone (Figures 7–13).



**Figure 6 Average weights of carcasses in the commercial harvest, 1999–2017**

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.

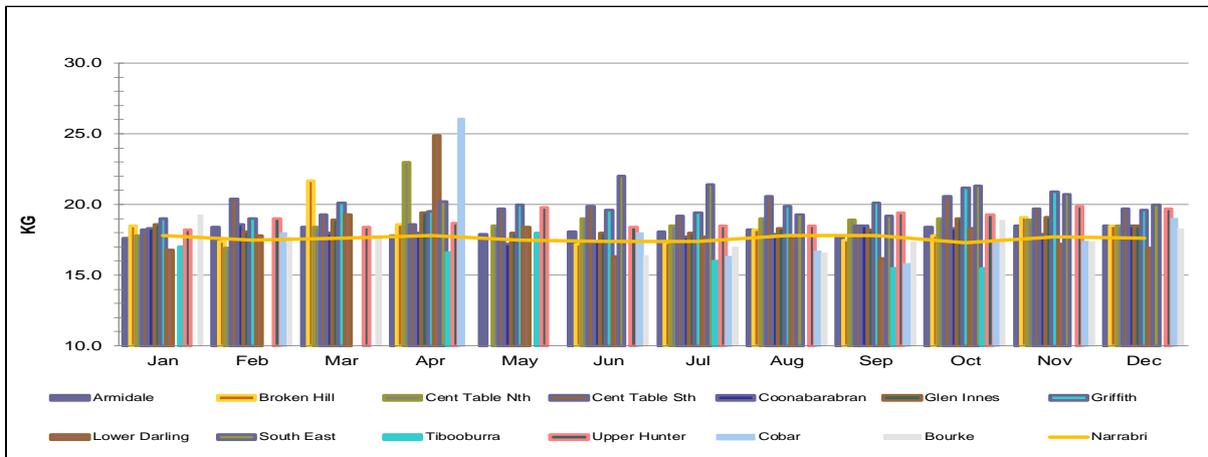
Average carcass weights were calculated monthly and compared with the long-term average (1999–2017) for each sex, species and zone, as required by Performance Indicator 12b of the plan. None of the 2018 monthly results were more than one standard deviation below the long-term average. Standard deviations ranged from 0.7 kilograms for eastern grey females in the Armidale zone to 7.6 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. However, in the following charts, no consideration is given to the differences in sample sizes between sexes, species and zones; for example, the total harvest of female wallaroos during 2018 was just 81 individuals, whereas the harvest of male red kangaroos was about 199,618.

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).

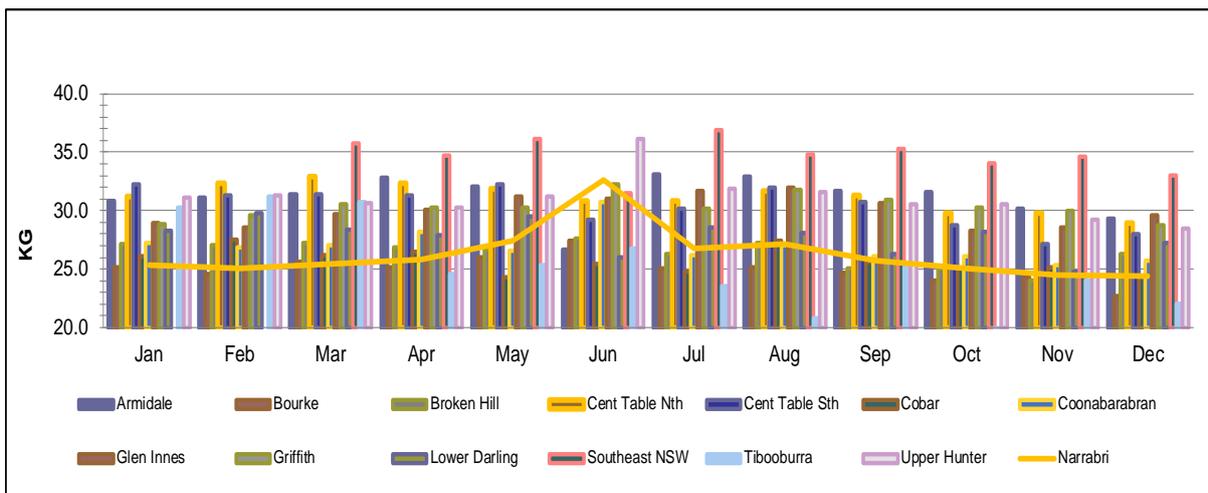
In the charts that follow, there are a number of months in which no animals of a given sex or species were shot in a particular zone; this results in missing columns in the charts. For example, in Figure 7 there were no female eastern grey kangaroos shot in the Southeast zone from January to March.

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.



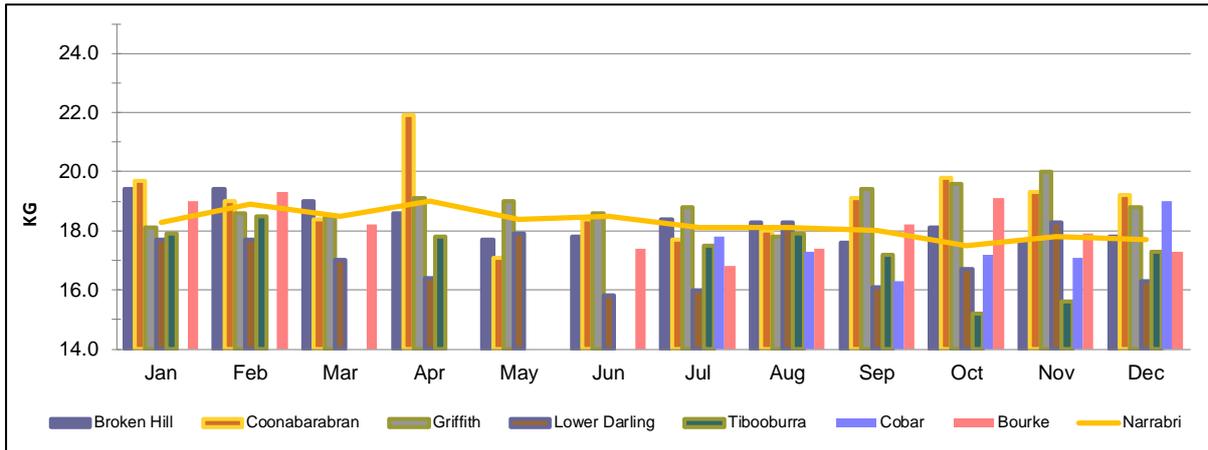
**Figure 7 Eastern grey kangaroo female average carcass weights in the commercial harvest, 2018**

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; for example, in the Cobar zone only 140 animals were harvested, and the chart shows a number of months where no animals were harvested.



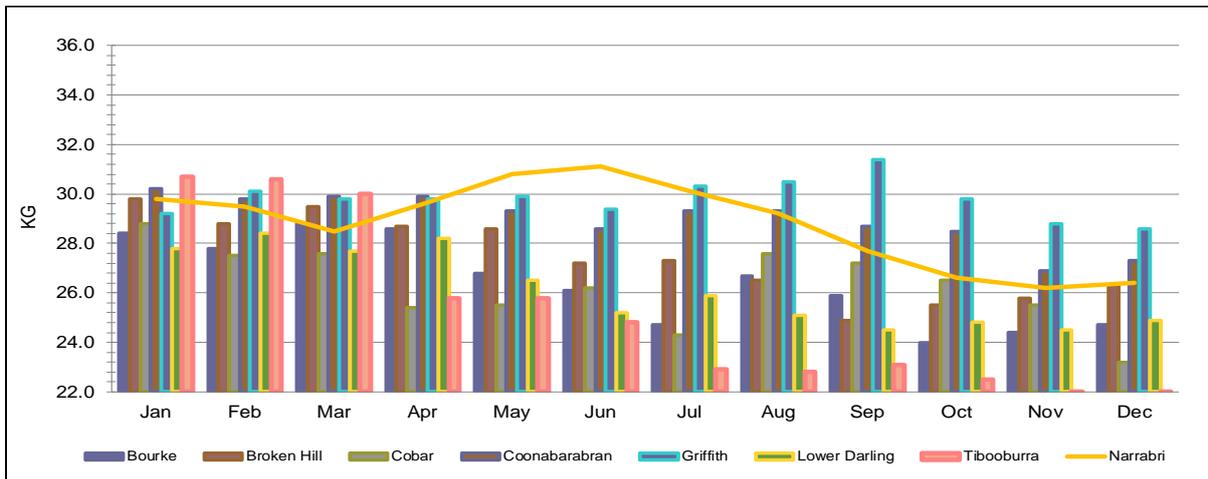
**Figure 8 Eastern grey kangaroo male average carcass weights in the commercial harvest, 2018**

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.



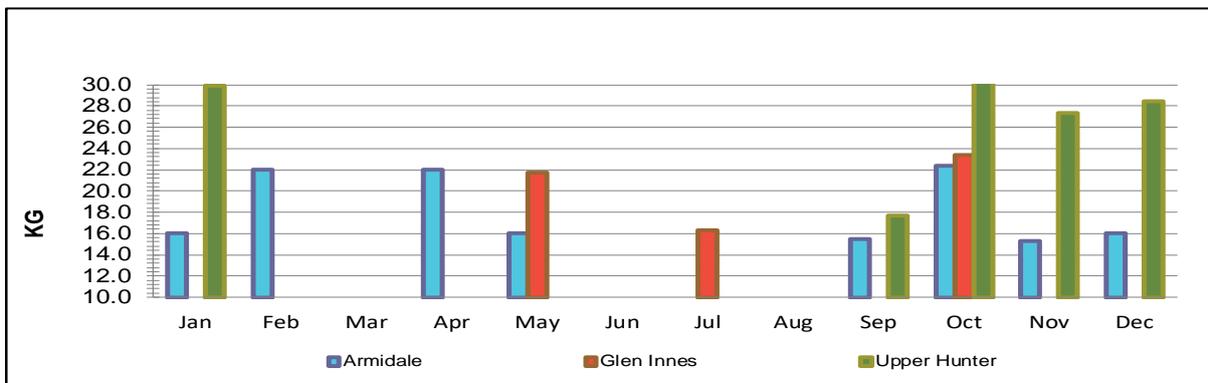
**Figure 9 Red kangaroo female average carcass weights in the commercial harvest, 2018**

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 15,600 compared with over 190,000).



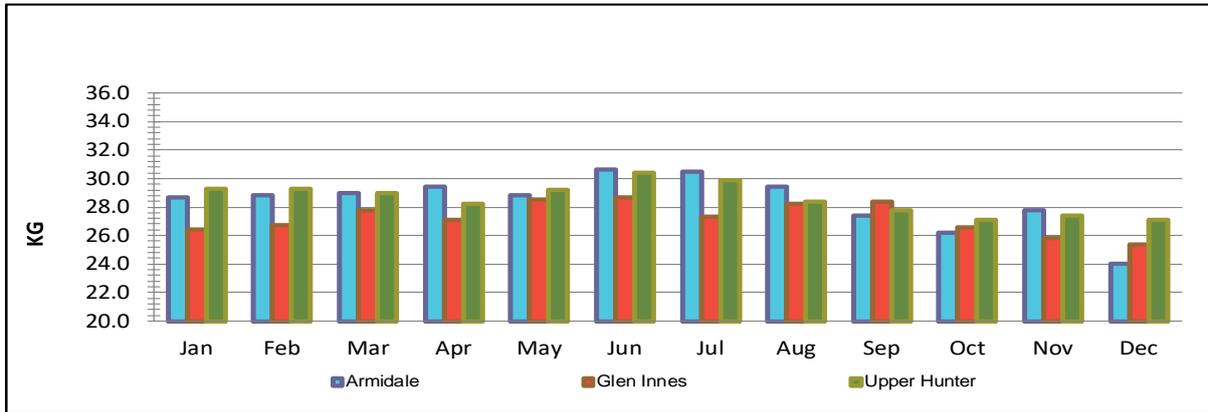
**Figure 10 Red kangaroo male average carcass weights in the commercial harvest, 2018**

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.



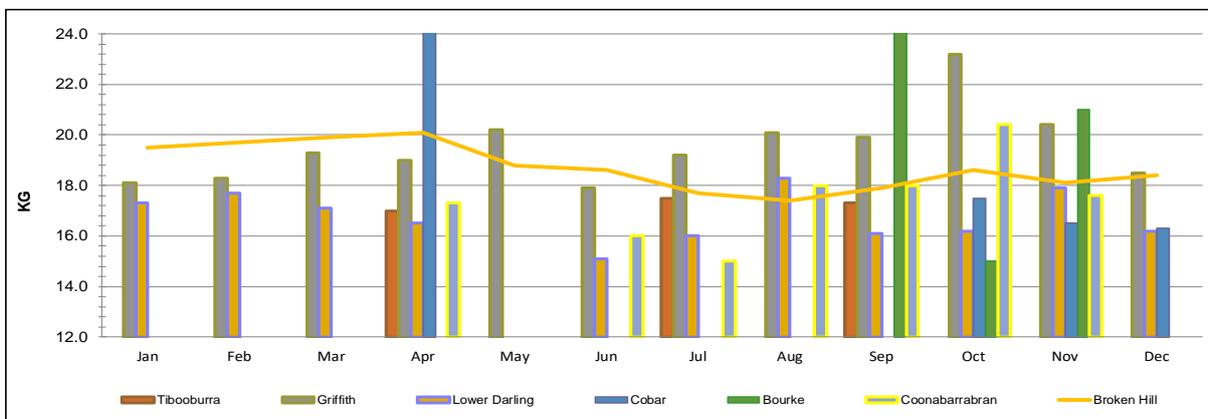
**Figure 11 Wallaroo female average carcass weights in the commercial harvest, 2018**

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 81.



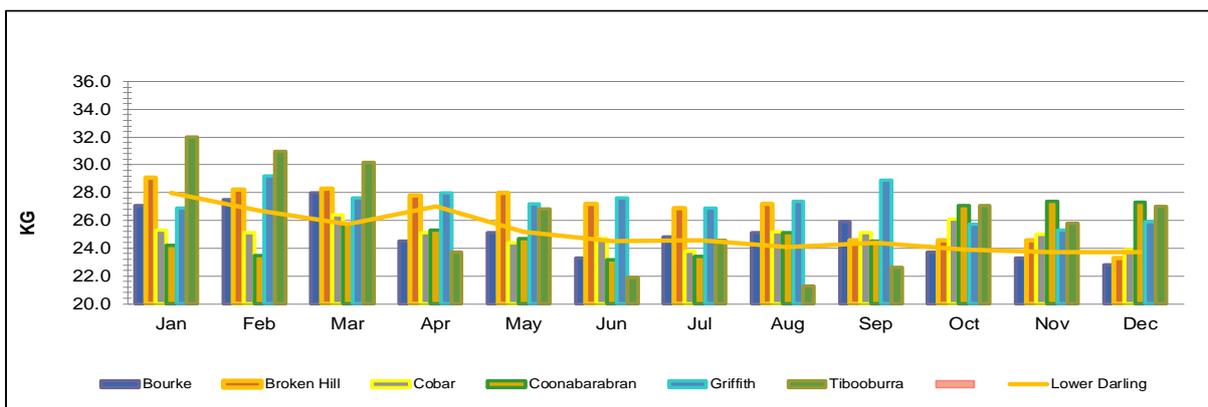
**Figure 12 Wallaroo male average carcass weights in the commercial harvest, 2018**

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, 2018**

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 2018 was about 5200 animals.



**Figure 14 Western grey kangaroo male average carcass weights in the commercial harvest, 2018**

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 in carcass weights for the Tibooburra zone is the result of a small sample size, with a total take in 2018 of only about 450 animals.

## 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 2018, 282,927 kangaroos were reported as culled under non-commercial licences, equivalent to 47.7% of the actual commercial harvest, or 12.6% of the commercial quota. Non-commercial culling was higher than the commercial harvest in the Southeast zone and this indicates that there is a substantial reliance on non-commercial culling for kangaroo management in this zone.

Non-commercial culling figures are unreliable 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 2018 there were 424 licensed commercial harvesters nominated on a total of 4269 commercial occupiers' licences throughout the commercial harvest zone.

Compliance audits of licensees are performed continuously by OEH. Checks are 'built-in' to the Kangaroo Management Section database, and OEH compliance officers conduct field investigations and compliance checks. Licensing staff contributed to compliance activities by scrutinising applications, compiling reports and investigating suspect activities and irregularities.

In addition to these activities, compliance staff investigate reports of illegal shooting activities to the fullest extent possible. During 2018 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.

There were no surveillance activities conducted during 2018. These activities when conducted are a joint compliance operation involving Police and OEH Compliance and Regulation teams.

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

## Inspection of premises

OEH compliance officers and/or NSW Food Authority compliance staff inspected chillers in kangaroo management zones for:

- non-head-shot kangaroos
- valid tags
- correctly affixed tags
- untagged kangaroos
- display of premises registration number and licence number for either pet food or human consumption (NSW Food Authority)
- presence of other animal carcasses.

Harvesters' vehicles are checked opportunistically for:

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

Harvesters are also checked to ensure they are carrying a Commercial Kangaroo Biodiversity Conservation Harvester's Licence under the BC Act.

During 2018, there were 121 chiller premises registered by animal dealer wholesalers including six registered by harvesters. All chillers were inspected at least once throughout the year and 26 inspections of processing works were conducted by OEH and a further one inspection and 73 audits conducted by NSW Food Authority. All chillers were registered throughout the year; however, a large number of chiller premises were not operational for significant periods during the year as a result of market factors. If premises are known to be closed, no inspections are conducted.

In addition to routine chiller inspections, OEH officers investigated instances of non-head-shot kangaroo carcasses originating in New South Wales and reported from processing works in South Australia and Queensland.

## Penalty infringement notices

Issuing of verbal cautions, written warnings or infringement notices is at the discretion of the OEH compliance officer, in accordance with the KMP's compliance policy and in consultation with the Manager Kangaroo Management Program.

During 2018 a total of seven infringement notices were issued, six for the offence of harming protected fauna and one for failing to comply with licence conditions.

In addition to the infringement notices, two official caution, 43 warning letters and 18 advisory letters were issued for various breaches of licence conditions. Although these cautions do not attract penalties, they are recorded and taken into account in any future compliance considerations.

For the following breaches official caution was issued:

- 2 for consigning underweight carcasses.

For the following breaches warning letters were issued:

- 1 Non-Head Shot
- 21 underweight carcasses

- 5 exceed number authorised
- 10 incorrect display on chiller
- 11 submit late harvester returns
- 1 untagged carcass
- 2 submit late harvester returns
- 1 tag substitution

For the following breaches an advisory letter was issued:

- 5 submit late harvester returns
- 13 overshoot on licence

OEH officers did seize 37 carcasses as a result of licence conditions being breached. If carcasses are seized and they meet the commercial licensing requirements, they are sold by OEH to avoid wastage. Carcasses that do not meet the licence requirements (e.g. they are underweight or body-shot) are not sold.

## Licence cancellations

OEH did not cancel any licences or registrations during 2018.

## Prosecutions

There were no prosecutions during 2018. There are other investigations that are continuing and prosecution action may result for offences committed in 2018 (Table 3).

**Table 3 Summary of compliance breaches and actions, 2018**

Offence	Action	Result
Contravene conditions of licence (s. 2.14) of the BC Act 2016*)	2 caution	No penalty
	1 penalty notices	Penalties at \$300 each
Harm protected fauna (s. 2.14) of the BC Act, 2016*)	6 penalty notice	Penalties at \$300 each

\* Biodiversity Conservation Act 2016

## Other factors affecting the commercial harvest in 2018

There were no reduced quotas set for population estimates for any commercial zone in 2018.

The industry continued to operate at a low level during 2018 and has achieved limited export of kangaroo meat throughout 2017 and 2018, limiting the industry's capacity to utilise the full commercial quota. Many chiller premises were closed down for various periods throughout the year or placed limits on the number of carcasses accepted each week so as to manage supply to processing plants.

In October 2012, one processor made the decision to accept only male carcasses in response to customer concerns about the fate of dependent young orphaned by the harvest. This decision has remained in place throughout 2018 and as a result, some harvesters are shooting fewer animals.

The combination of these impacts resulted in only 26.6.% of the available quota being utilised (about 4.1% of the estimated population).

## Research involvement in 2018

There was one research project initiated by KMP in 2018:

Lunney et al 2018, Four decades of research and monitoring the populations of kangaroos in New South Wales: one of the best long-term datasets in Australia *Australian Zoologist* **39**, 4, 784-800.

## Appendix A: Progress against performance indicators in 2018

Management action and method	Performance indicators	Progress in 2018
<b>Objective 1: To ensure animals are harvested or euthanised using humane methods</b>		
<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><b>Method</b> Monitor requirements including:</p> <ul style="list-style-type: none"> <li>• firearms licence</li> <li>• accreditation under national code of practice</li> <li>• competency in firearms accuracy</li> <li>• self-reporting of non-compliance</li> <li>• risk-based approach to auditing compliance.</li> </ul>	<p>1. Implementation indicators:</p> <ol style="list-style-type: none"> <li>100% of licence holders have met shooter competency standards</li> <li>reports received from chiller operators weekly</li> <li>results of weekly reports assessed for any non-compliances</li> <li>compliance response taken for identified non-compliances proportionate to the risk to program objectives.</li> </ol>	<ol style="list-style-type: none"> <li>complete</li> <li>complete</li> <li>ongoing and all results reported</li> <li>all non-compliances reported to compliance teams for appropriate action.</li> </ol>
<p>Reports through the memorandum of understanding with the Commonwealth Department of Agriculture and Water Resources Meat Exports Branch.</p> <p><b>Method</b> Department inspects kangaroo carcasses before being exported.</p>	<p>2. OEH reports non-compliance events annually and applies risk assessment to reported breaches. OEH monitors reports and responds consistent within its compliance framework.</p>	<p>Breaches are managed in accordance with OEH Compliance Policy.</p>
<p>Department inspects kangaroo carcasses in chiller premises while performing routine chiller inspections.</p>	<p>3. OEH reports non-compliance events annually and applies risk assessment to reported breaches and reports breaches to the NSW Food Authority.</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 Authority offences are reported to the Authority.</p>

Management action and method	Performance indicators	Progress in 2018
<p>Non-compliance reports received through NSW Enviro-line.</p> <p><b>Method</b> Breaches reported to OEH are prioritised and assessed using a risk management assessment tool.</p>	<p>4. OEH 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, risk assessed and managed by the relevant compliance team.</p>
<p>Self-reporting from industry professionals.</p> <p><b>Method</b> Apply risk assessment methods.</p>	<p>5. Reports received are prioritised using the OEH Regional Operations Compliance Risk Assessment Framework and investigated.</p>	<p>All reports are recorded in the compliance case management system, risk assessed and managed by the relevant compliance team.</p>
<p>Inspect each chiller premises once per year.</p> <p><b>Method</b> Routine inspections consistent with OEH safety protocol.</p>	<p>6. Inspections and breaches reported annually.</p>	<p>Job Safety Assessments (JSAs) and Job Safety Briefings (JSBs) reviewed and implemented for inspections. All chillers were inspected at least once.</p>
<p>Inspect every processing plant three times per year.</p> <p><b>Method</b> Routine inspections consistent with OEH safety protocol.</p>	<p>7. Inspections and breaches reported annually.</p>	<p>JSAs and JSBs reviewed and implemented for chiller and processing work inspections. All processing works in NSW were inspected at least twice during 2018.</p>
<p>Conduct two field audits of licensed harvesters per year.</p> <p><b>Method</b> Routine inspections consistent with OEH safety protocol.</p>	<p>8. Inspections and breaches reported annually.</p>	<p>Harvester field audits were not conducted in 2018 due to work health and safety risks.</p>

Management action and method	Performance indicators	Progress in 2018
<b>Objective 2: To ensure that the commercial harvest is ecologically sustainable</b>		
Population monitoring. <b>Method</b> Annual aerial surveys.	9. 100% of surveys conducted by 30 November (annually or triennially as relevant).	Complete. In 2018 aerial surveys of Western Plains were conducted in June–July–August and population estimates were made available on the KMP webpage in December. Helicopter survey of Southeast management zone completed in September.
Quota set each year as a percentage of kangaroo population. <b>Method</b> 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 2018. Harvest did not exceed allocations in 2018.
Restriction of harvest area (no-harvest sanctuaries). <b>Method</b> Harvesting is permitted only on private land.	11. 100% of harvest returns specify the private land where the kangaroo was harvested.	Harvesting is only permitted on private land.
Risk assessment of species through harvest data. <b>Method</b> Analysis of kangaroo data from harvesters (weight, sex, number) per zone.	12. Data analysis indicators: 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.	a. complete b. complete c. complete (refer to density estimate and threshold tables in 2018 Quota Report) d. no populations showed trends below the thresholds.

Management action and method	Performance indicators	Progress in 2018
<p>Maintenance of population within thresholds.</p> <p><b>Method</b> 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 2018.</p>
<p>Regular review and adaptive program management.</p> <p><b>Method</b> 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 approval by the Minister for the Environment and Energy at least 12 months before its expiry.</p>	<p>14. Review indicators:</p> <ul style="list-style-type: none"> <li>a. 100% of harvester returns are received each quarter</li> <li>b. annual report prepared and submitted to the Commonwealth Department of the Environment and Energy, and published on the OEK kangaroo management webpage by 31 March each year</li> <li>c. Commercial Kangaroo Harvest Management Plan is reviewed in 2021 or as required, including in the event of legislative change.</li> </ul>	<ul style="list-style-type: none"> <li>a. 100% of harvester returns were received each quarter during 2018</li> <li>b. 2017 annual report completed and published on the OEK webpage</li> <li>c. ongoing.</li> </ul>

Management action and method	Performance indicators	Progress in 2018
<p>Triggers to suspend the harvest if population declines, or if population health is declining.</p> <p><b>Method</b></p> <p>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 did not fall below the thresholds in any zone.</p>
<p>Implementation of a risk-based compliance program. Audit of compliance program undertaken periodically to ensure confidence in the program.</p> <p><b>Method</b></p> <p>OEH will implement proactive compliance, including analysing data and intelligence to apply a risk-based approach to compliance.</p> <p>OEH 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.</p> <p>OEH audit team to periodically audit higher risk aspects of the program.</p> <p>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"> <li>a. all allegations of non-compliance assessed for risk to program objectives, and investigated as required</li> <li>b. all self-reports of non-compliance assessed for risk to program objectives and investigated as required</li> <li>c. at least one audit program undertaken in the period covered by this plan.</li> </ul>	<p>The compliance audit program commenced in late 2017 and due in early 2019. The audit program will assess allegations of non-compliance including self-reports of non-compliance for risk to the program objectives.</p>

Management action and method	Performance indicators	Progress in 2018
<p>Special kangaroo harvest quotas are set.</p> <p><b>Method</b> 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 2018.</p>
<p><b>OEH commitment: Engage with community and industry stakeholders to ensure the objectives of this plan are met</b></p>		
<p>Proactive engagement with community and industry stakeholders.</p> <p><b>Method</b> Engage with Kangaroo Management Advisory Panel (KMAP) members representing the range of stakeholder interests, to be appointed by the Chief Executive of OEH. Engage with KMAP on the preparation of the annual report and quota report, and other items as required.</p>	<p>18. KMAP meetings at least twice a year.</p>	<p>KMAP meetings were held in March and November 2018.</p>
<p>Provide regular up to date information on the OEH website.</p> <p><b>Method</b> Maintain an active role in web-based and manual delivery of information.</p>	<p>19. Annual report and quota report uploaded to OEH kangaroo management webpage, and other relevant documents accessible as required.</p>	<p>2017 annual report and 2018 quota report were published to the OEH webpage in 2018. Monthly take and allocation reports were published to the OEH webpage during 2018.</p>