Queensland Commercial Macropod Management Program

Annual Report 2019

Queensland Government

Prepared by: Environmental Services and Regulation, Department of Environment and Science

March 2020

Preface

This annual report summarises the activities of the Commercial Macropod Management Program in Queensland for the period 1 January 2019 to 31 December 2019. In accordance with the Queensland Wildlife Trade Management Plan for Export—Commercially Harvested Macropods 2018–2022, the report addresses:

- actual harvest by zone and species compared to quota
- harvest sex ratio, average carcass weights and skin take
- any special quota used
- non-commercial harvest mortality
- compliance statistics
- climate
- research and experiments
- program improvements.

For the 2019 harvest period, 983 commercial wildlife harvesting licences for macropods, commonly known as harvester licences were issued. There were 99 commercial wildlife licences for dead macropods, commonly known as dealer's licences, 9 commercial wildlife licences for dead macropods (meat processing) and one commercial wildlife licence for dead macropods (tanning) current. Data from dealer returns, entered up to 10 February 2020, indicates that there were 758,362 macropods commercially harvested and sold, representing 26% of the overall quota. The harvest was predominantly for carcasses used for both human consumption and pet food.

No quota was exceeded for any species in any harvest zone in 2019. The highest percentage use of quota was for eastern grey kangaroos in the central zone at 36.5%. In all harvest zones, the percentage of the population used for each species was less than 5%.

The commercial harvest is typically biased towards males due to their generally larger size and weight when compared to females. For 2019 the harvest for each species was biased towards males by 77.5% or greater.

During the 2019 harvest period, the department issued three infringement notices and 118 warning notices for offences relating to the commercial macropod harvest.

Contents

1. Background

The Department of Environment and Science (the department) administers the harvest in accordance with the following overarching goal: 'to provide for the sustainable use of macropod species covered by the plan, in accordance with the principles of ecologically sustainable development' (Anon 2017).

There are three main aspects to the program:

- Monitoring populations
- Setting quotas
- Managing the harvest.

Three species can be commercially harvested in Queensland:

- Red kangaroo *(Macropus rufus)*
- Eastern grey kangaroo *(Macropus giganteus)*
- Common wallaroo *(Macropus robustus).*

These commercially harvested species are abundant over a broad area of Queensland and Australia. None of these species are listed as threatened under state or Australian Government legislation; all are listed as 'least concern' wildlife under the *Nature Conservation (Wildlife) Regulation 2006*.

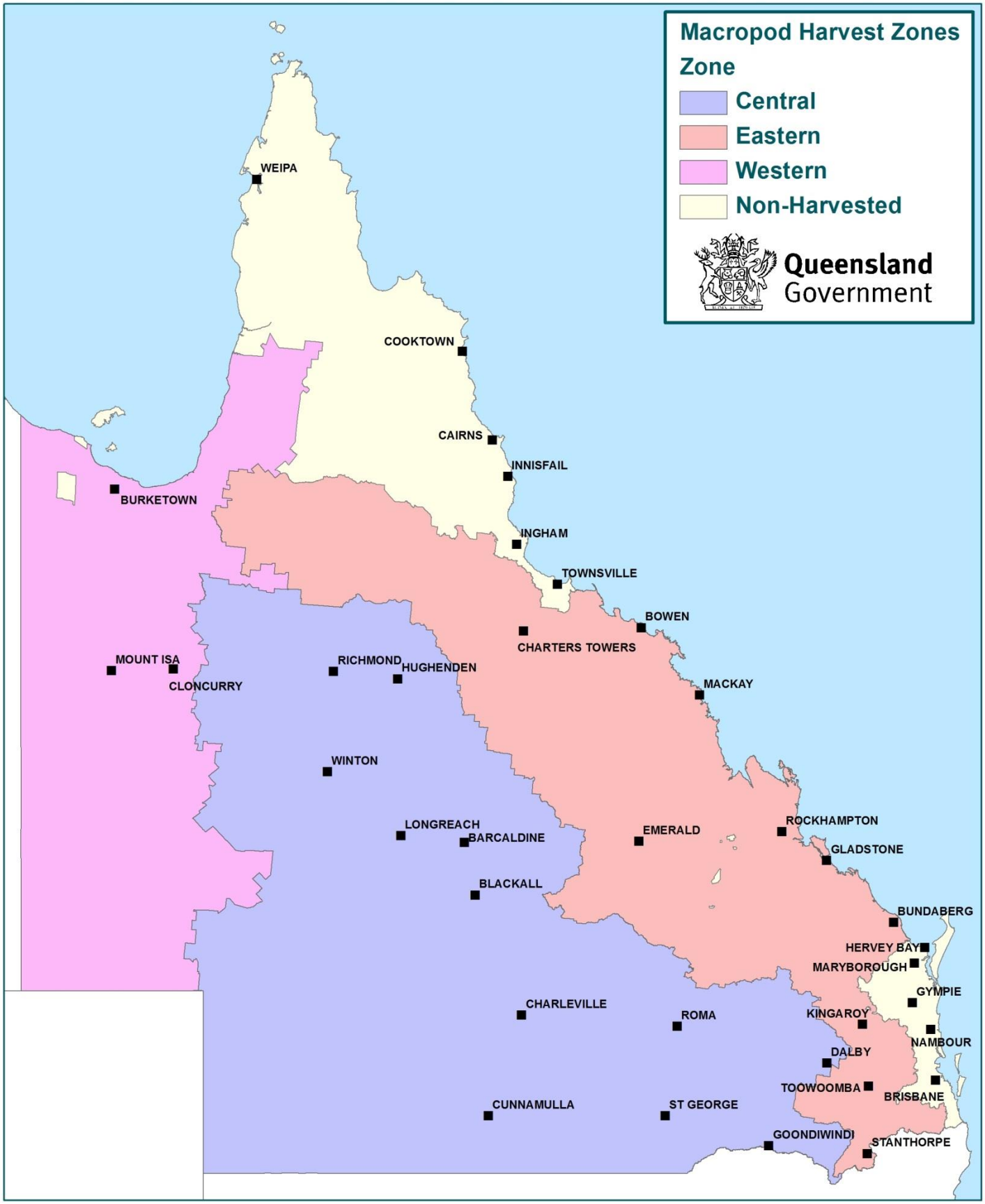
The harvesting of these macropods is regulated through or with consideration to the:

- *Nature Conservation Act 1992*
  - *Nature Conservation (Administration) Regulation 2017*
  - *Nature Conservation (Wildlife Management) Regulation 2006*
  - *Nature Conservation (Wildlife) Regulation 2006*
  - *Nature Conservation (Macropod) Conservation Plan 2017*
- *Environment Protection and Biodiversity Conservation Act 1999*
- Queensland Wildlife Trade Management Plan for Export—Commercially Harvested Macropods—2018–2022
- *Animal Care and Protection Act 2001*
- *Food Production (Safety) Act 2000.*

Management of the harvest is facilitated via quotas that set the number of animals that can be taken. Quotas are based on population estimates derived from annual aerial surveys of the commercially harvested species. Quotas are set for each species for four harvest zones (Figure 1):

- Non-harvest zone (quota zero)
- Eastern harvest zone
- Central harvest zone
- Western harvest zone.

Figure 1 – Queensland harvest zones in 2019



Quotas are calculated using a fixed proportion of the estimated macropod populations within the harvest areas. Proportions are adjusted for each species across the harvest zones in relation to the margins of error present in population estimates derived from the aerial surveys. The maximum proportions used for each species are 15% of the populations for eastern grey kangaroos and common wallaroos and 20% of the population for red kangaroos for the central zone. For the eastern and western zones, where survey effort is less extensive when compared to the central zone, the more conservative maximum proportion of 10% is applied for all three species.

These sustainable-use harvest proportions are based on research and modelling undertaken by Caughley et al. (1987) and Hacker et al. (2002) and are currently accepted by the scientific community, state and Australian governments, for determining state quota limits.

This annual report summarises the activities of the Commercial Macropod Management Program for the period 1 January 2019 to 31 December 2019. In accordance with the Queensland Wildlife Trade Management Plan for Export—Commercially Harvested Macropods—2018–2022, the report will address:

- harvest by zone and species compared to quota
- harvest sex ratio, average carcass weights and skin take
- any special quota used
- non-commercial harvest mortality
- compliance statistics
- climate
- research and experiments
- program improvements.

All macropod species are 'protected animals' in Queensland under the *Nature Conservation (Wildlife) Regulation 2006. The Nature Conservation (Administration) Regulation 2017* provides for the licensing of a range of activities in relation to the commercial harvesting of macropods in Queensland.

Commercially harvested macropods must be taken in accordance with the *Nature Conservation (Macropod) Conservation Plan 2017* under a licence issued by the department.

The harvest is controlled by the use of self-locking numbered plastic tags with a unique colour code for each species and year. The following applies to the use of tags:

- Tags are issued to a specific harvester.
- Tags must be securely attached to the skin of every macropod commercially harvested.
- A tag can only be removed from the macropod skin during the skin tanning process at a licensed tannery.
- The tags are self-locking and tamper-evident.
- The tags are individually numbered and of a different colour for each consecutive year and species.
- A fee (fixed by regulation) is charged for the sale of tags.

Record and return of operations are submitted to the department by harvesters and dealers at regular periods. Harvest statistics from returns are used to monitor and manage the harvest.

2. Harvest management

For the 2019 harvest period, 983 commercial wildlife harvesting licences for macropods, commonly known as harvester licences were issued. There were 85 commercial wildlife licences for dead macropods, commonly known as dealer's licences, 9 commercial wildlife licences for dead macropods (meat processing) and one commercial wildlife licence for dead macropods (tanning) issued.

All licences were issued in accordance with legislative requirements and within regulatory timeframes.

Tags were limited to the quota amount for each species in each zone to ensure no over-harvest occurred. The highest number of tags sold as a proportion of quota was 41.2% and 35.5% for eastern grey kangaroos and common wallaroos, respectively, in the central zone. The actual harvest for these species in this zone was 36.5% and 24.6% of available quota for eastern grey kangaroos and common wallaroos, respectively. Statistics on the harvest and tag sales are updated monthly and made available to the public via the Queensland Government website. This assists the industry to monitor the harvest and tag availability.

Table 1—Tag sales and harvest for 2019

Tag categories by zone	2019 quotas	Tags sold		Reported harvest	
		Number of tags	% of quota	Number of macropods	% of quota
Central zone					
Eastern grey kangaroo	1,099,800	453,500	41.2%	401,912	36.5%
Red kangaroo	933,700	249,100	26.7%	203,525	21.8%
Common wallaroo	212,200	75,250	35.5%	52,264	24.6%
Eastern zone					
Eastern grey kangaroo	417,150	93,100	22.3%	81,473	19.5%
Red kangaroo	18,850	5,500	29.2%	2,990	15.9%
Common wallaroo	156,600	9,900	6.3%	5,266	3.4%
Western zone					
Red kangaroo	43,450	11,650	26.8%	9,922	22.8%
Common wallaroo	32,150	1,450	4.5%	1,010	3.1%
Total	2,913,900	899,450	30.9%	758,362	26%

To ensure harvesters have fair and equitable access to the finite number of tags available, the program regulates the distribution of tags. This is done by establishing a tag allowance for each harvester and ensuring the tags are being used before further tags are ordered.

3. Harvest

The data from dealer returns, entered up to 10 February 2020, indicates that there were 758,362 macropods commercially harvested and sold, representing 26% of the overall quota. The commercial harvest of macropods does not occur evenly across the harvest zones. The majority of harvesting occurs in the central harvest zone. Figure 2 shows the distribution of the harvest across the state. Of the 758,362 animals harvested, there were 216,437 red kangaroos, 483,385 eastern grey kangaroos and 58,540 common wallaroos harvested (Figure 3).

Figure 2—Commercial harvest in local government areas during the 2019 harvest period

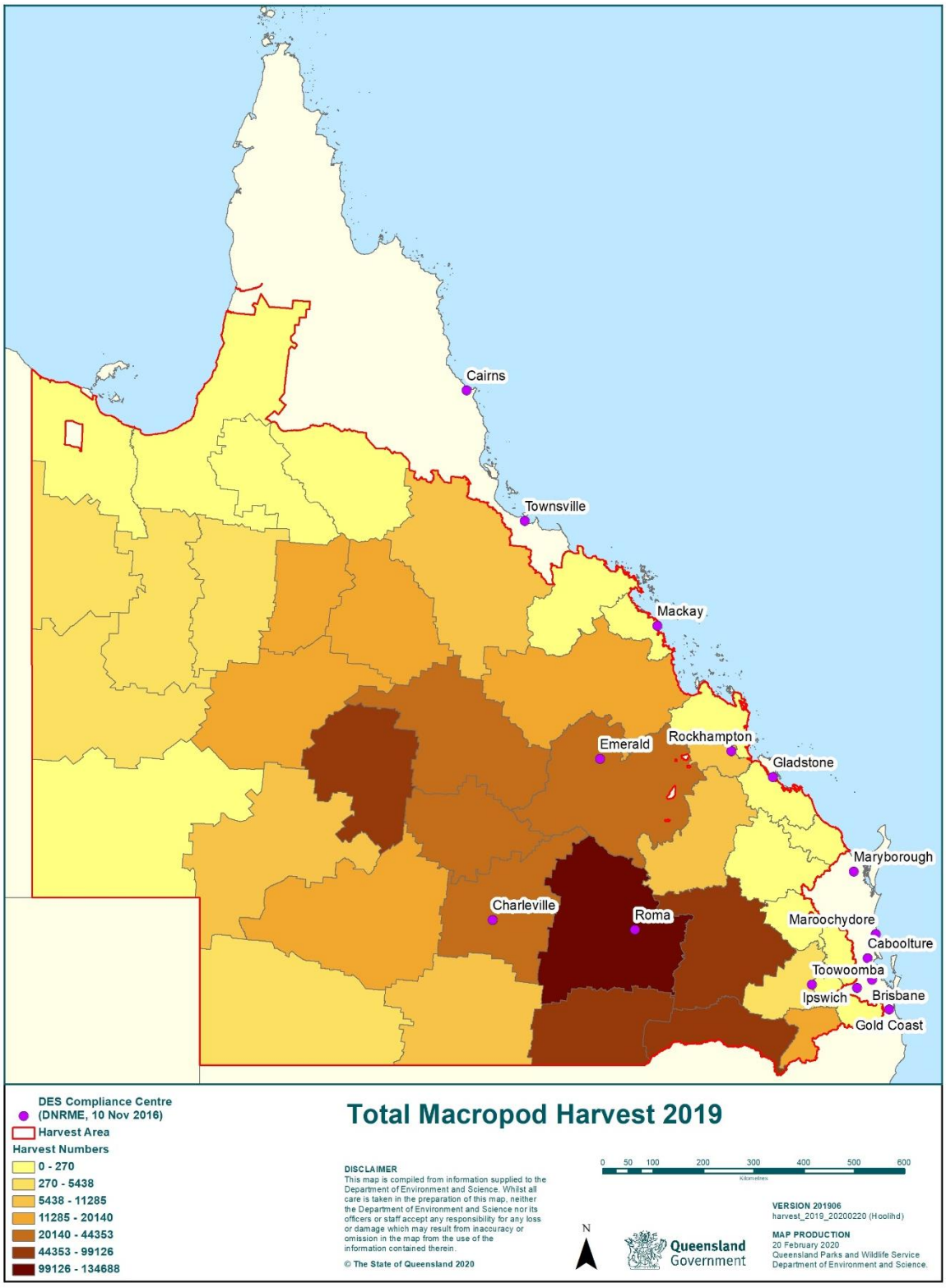
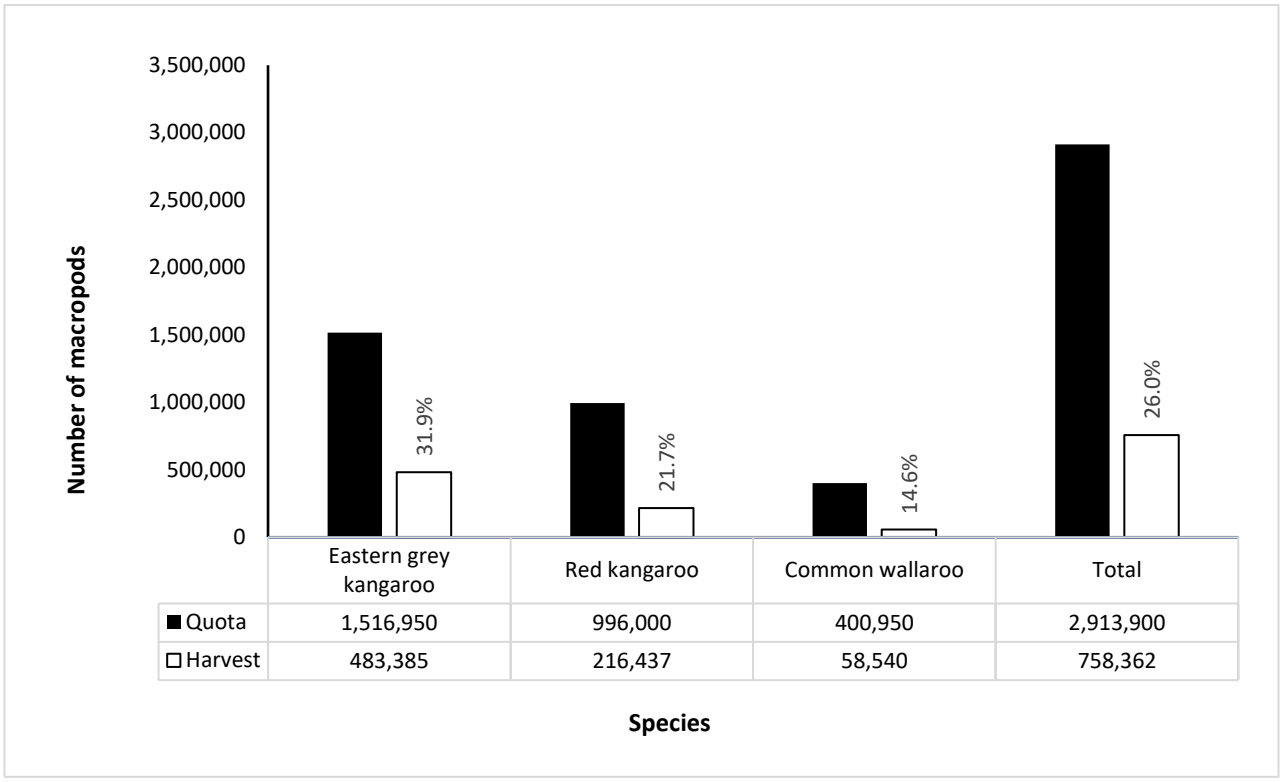


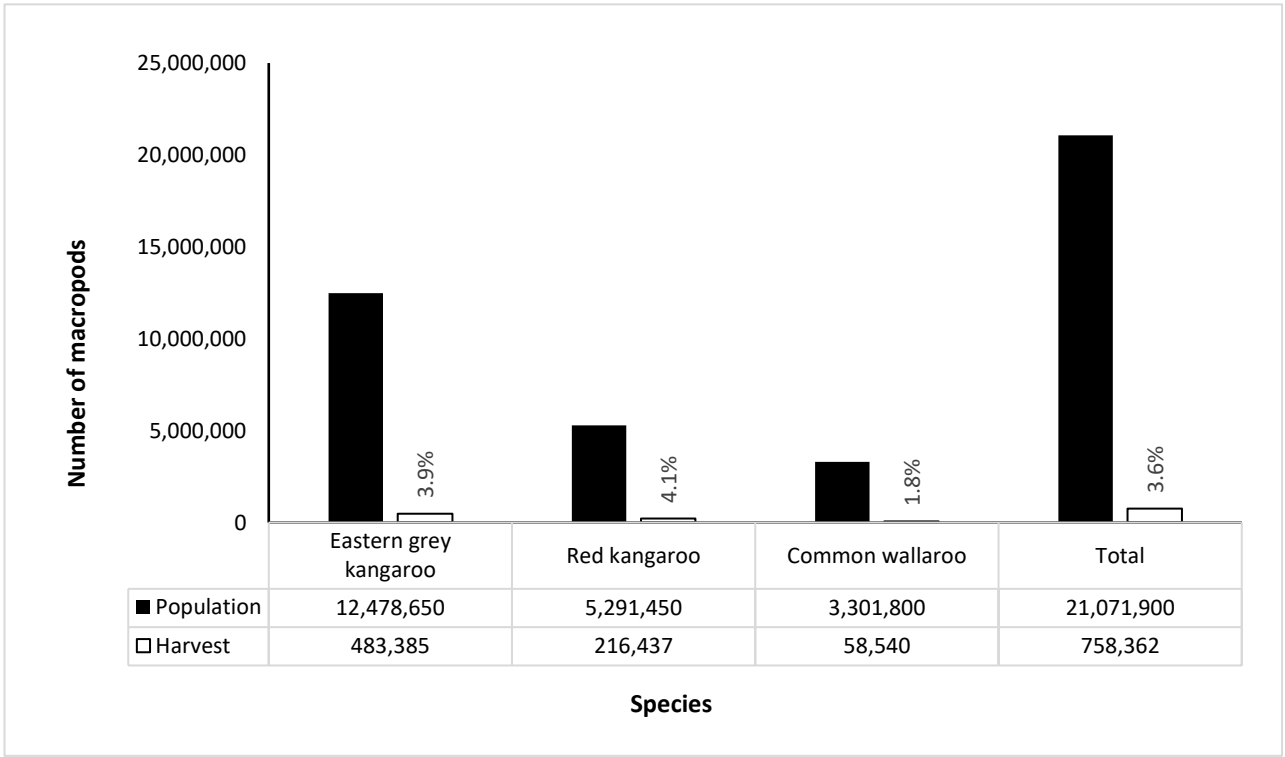
Figure 3—Total number of macropods harvested in 2019 compared to quotas



	Eastern grey kangaroo	Red kangaroo	Common wallaroo	Total
■ Quota	1,516,950	996,000	400,950	2,913,900
□ Harvest	483,385	216,437	58,540	758,362

For all three commercially harvested species the percentage of the population harvested in 2019 was only 3.6% of the 2018 estimated population (Figure 4). For red kangaroos, 4.1% of the estimated population in the harvest area was harvested, while 3.9% of the estimated population of eastern grey kangaroos and 1.8% for common wallaroos was harvested.

Figure 4—Percentage of the 2018 estimated population harvested in 2019



	Eastern grey kangaroo	Red kangaroo	Common wallaroo	Total
■ Population	12,478,650	5,291,450	3,301,800	21,071,900
□ Harvest	483,385	216,437	58,540	758,362

Tables 2–5 contain detailed summaries of the commercial harvest in 2019. Quotas for each species in each zone were not exceeded in 2019. The highest percentage of quota used was for eastern grey kangaroos in the central zone at 36.5%. In all harvest zones the percentage of the population harvested for each species was below 5%.

Table 2—Total harvest in 2019

Species	Population estimate 2018	Quota 2019	Harvest take 2019	% quota used 2019	% population harvested 2019
Eastern grey kangaroo	12,478,650	1, 516,950	483 385	31.9%	3.9%
Red kangaroo	5,291,450	996,050	216 437	21.7%	4.1%
Common wallaroo	3,301,800	400,950	58 540	14.6%	1.8%
Total	21 071 900	2 913 950	758 362	26%	3.6%

Note: population estimates are based on aerial surveys conducted in 2018, which were used to set the 2019 quota. Harvest figures are based on data available 10 February 2020.

Table 3—Harvest of red kangaroos in 2019

Zone	Population estimate 2018	Quota 2019	Harvest take 2019	% quota utilised 2019	% population harvested 2019
Central	4,668,750	933,700	203 525	21.8%	4.4%
Eastern	188,300	18,850	2 990	15.9%	1.6%
Western	434,400	43,450	9 922	22.8%	2.3%
Total	5,291,450	996,050	216 437	21.7%	4.1%

Note: population estimates are based on aerial surveys conducted in 2018, which were used to set the 2019 quota. Harvest figures are based on data available 10 February 2020.

Table 4—Harvest of eastern grey kangaroos in 2019

Zone	Population estimate 2018	Quota 2019	Harvest take 2019	% quota utilised 2019	% population harvested 2019
Central	8,293,350	1,099,800	401 912	36.5%	4.8%
Eastern	4,171,500	417,150	81 437	19.5%	1.9%
Western	13,800	0	0	NA	NA
Total	12,478,650	1, 516,950	483 349	31.9%	3.9%

Note: population estimates are based on aerial surveys conducted in 2018, which were used to set the 2019 quota. Harvest figures are based on data available 10 February 2020.

Table 5—Harvest of common wallaroos in 2019

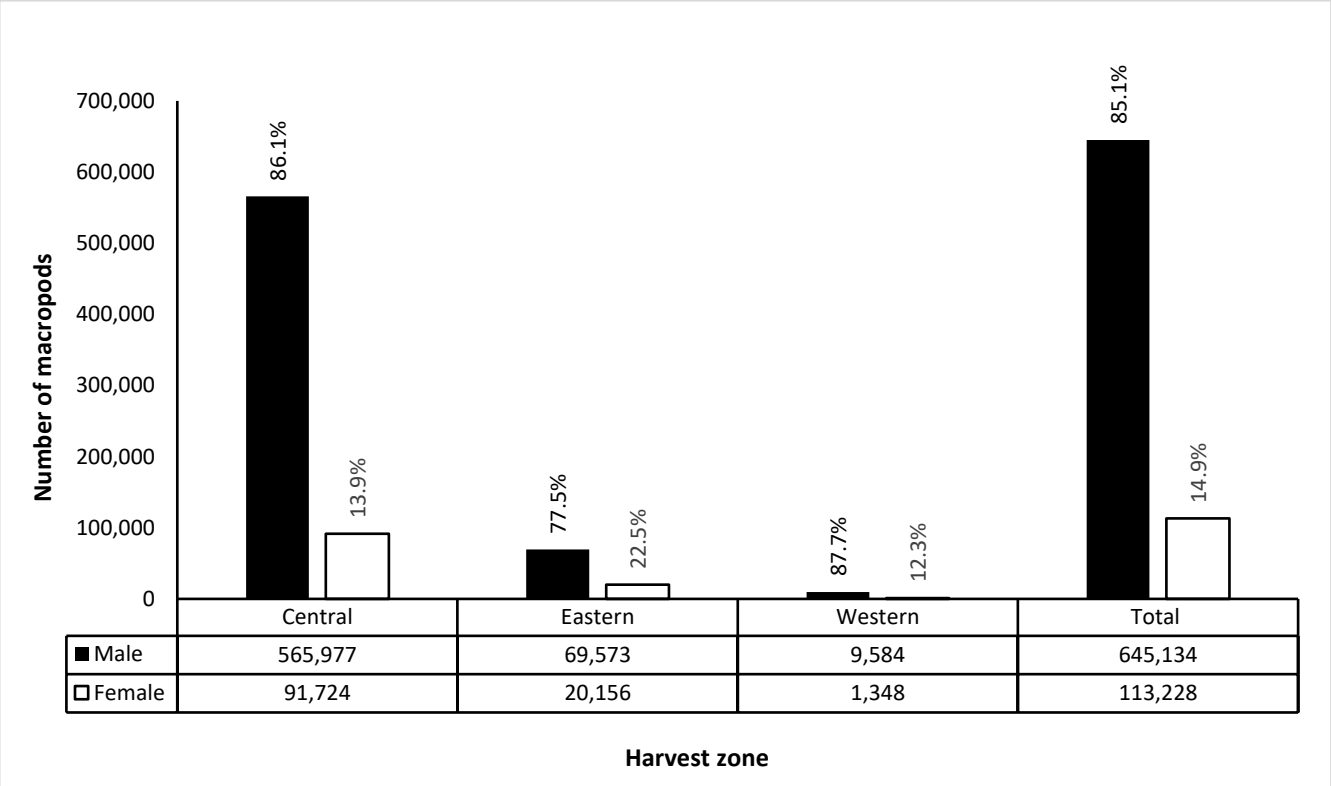
Zone	Population estimate 2018	Quota 2019	Harvest take 2019	% quota utilised 2019	% population harvested 2019
Central	1,414,600	212,200	52 264	24.6%	3.7%
Eastern	1,565,850	156,600	5 266	3.4%	0.3%
Western	321,350	32,150	1 010	3.1%	0.3%
Total	3,301,800	400,950	58 540	14.6%	1.8%

Note: population estimates are based on aerial surveys conducted in 2018, which were used to set the 2019 quota. Harvest figures are based on data available 10 February 2020.

3.1 Harvest sex ratio

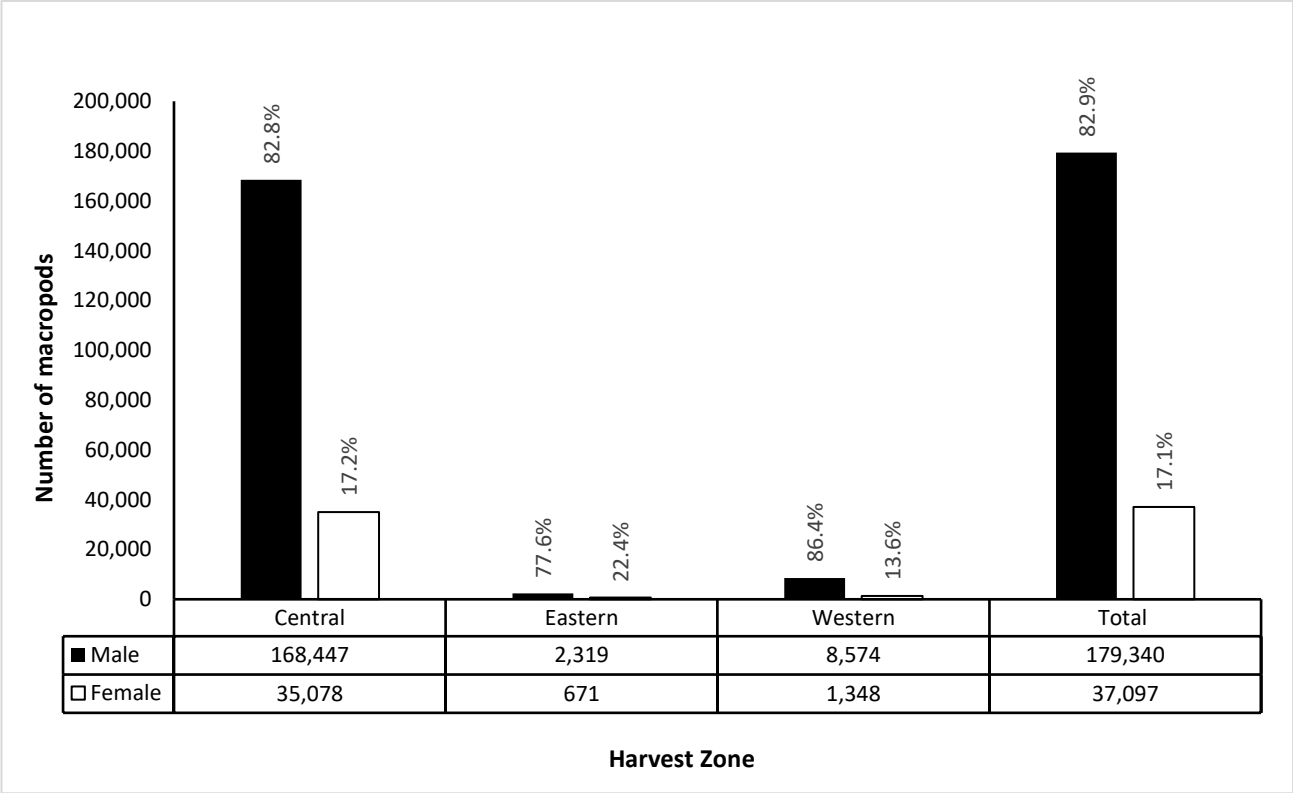
The commercial harvest is typically biased towards males due to their generally larger size and weight when compared to females. For 2019, the harvest for each species was biased towards males by 77% or greater (Figure 5). Females composed less than 15% of the overall harvest.

Figure 5—Sex ratio of harvested macropods in 2019 for all harvest zones combined



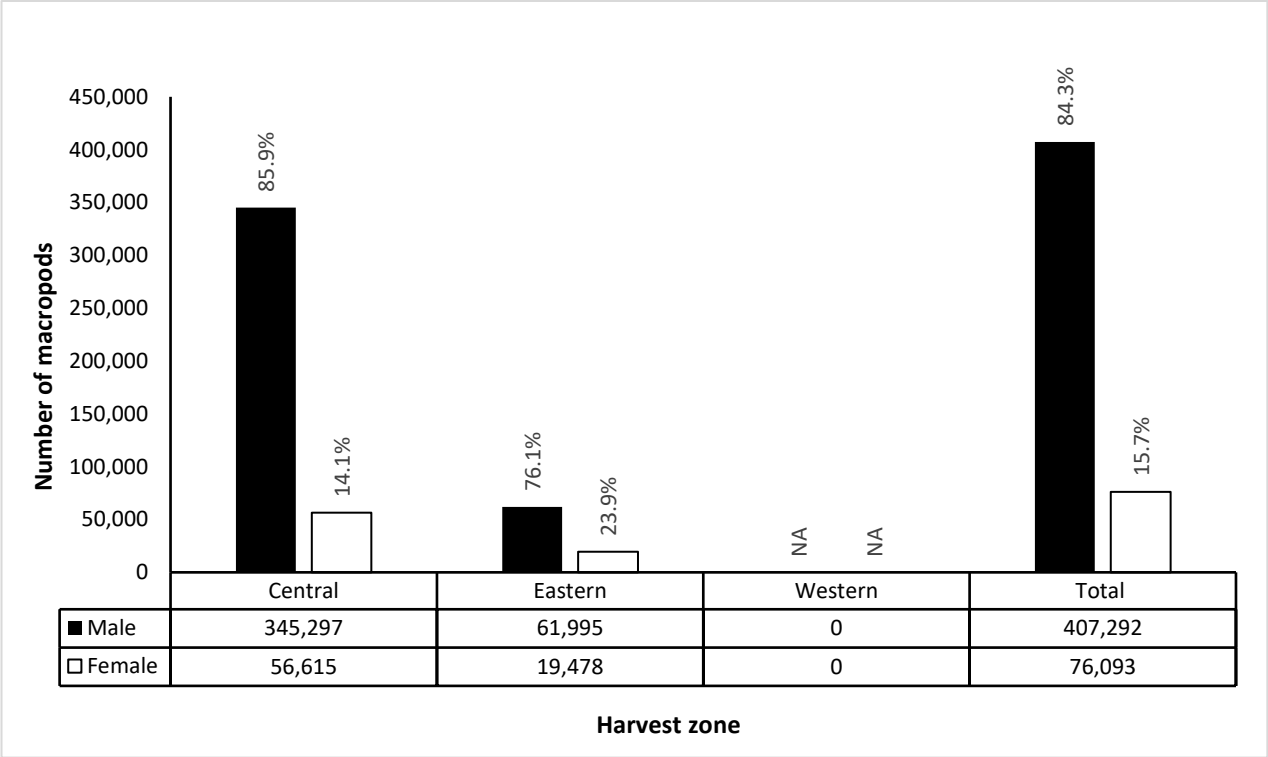
For red kangaroos, the highest percentage of females harvested was in the central zone at 17.2%. The overall take of females for this species was 17.1% of the harvest (Figure 6).

Figure 6—Sex ratio of harvested red kangaroos in 2019



For eastern grey kangaroos the greatest percentage take of females was 23.9% in the eastern zone. Overall for this species, females comprised 15.7% of the harvest (Figure 7).

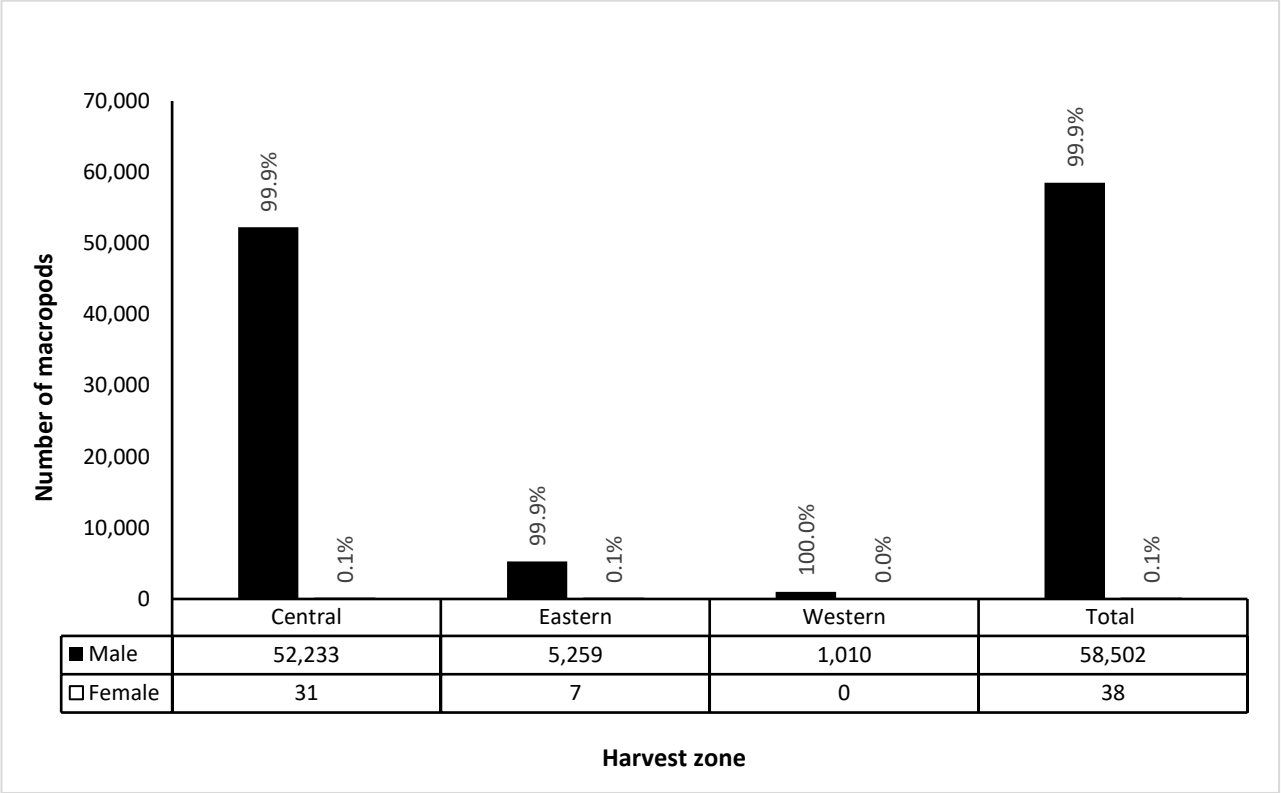
Figure 7—Sex ratio of harvested eastern grey kangaroos in 2019



For common wallaroos the percentage of the harvest containing females was the lowest amongst the three commercially harvested species at an overall total of only 38 animals. The greatest percentage take of females for

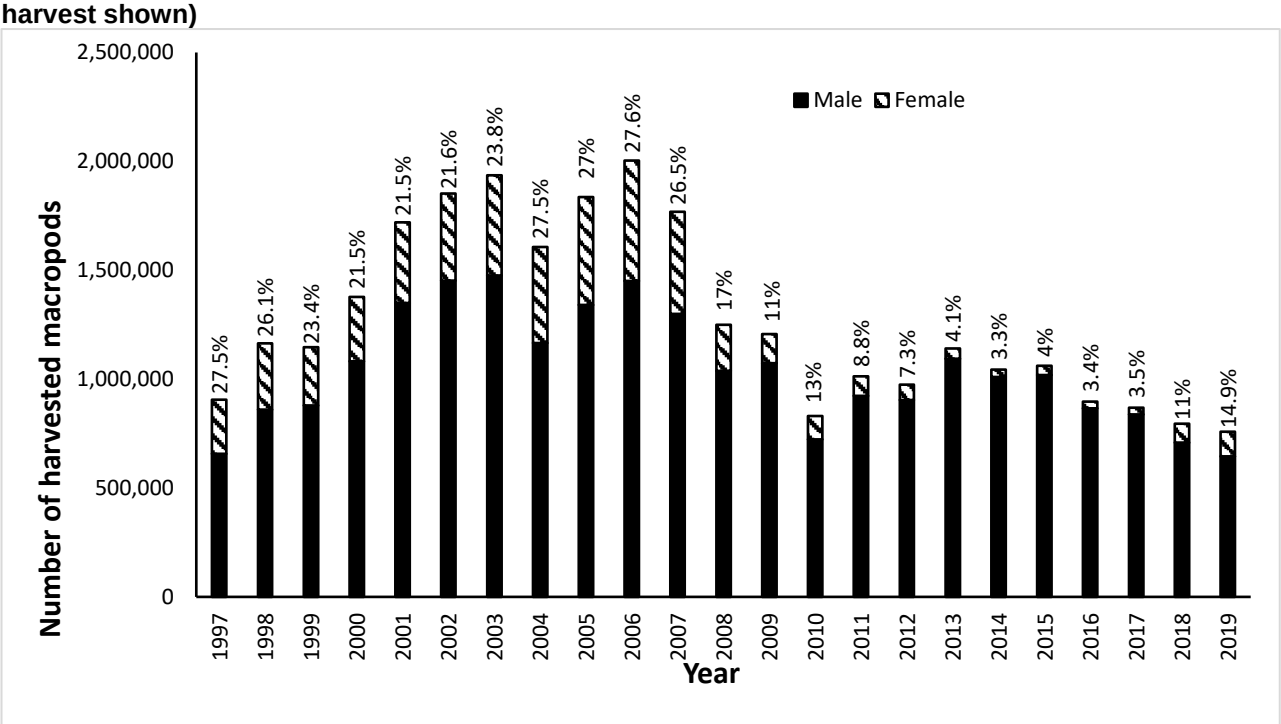
this species was 0.1% in the central and eastern zones (Figure 8).

Figure 8—Sex ratio of harvested common wallaroos in 2019



The proportion of the commercial harvest comprising females in 2019 was less than 15%. The percentage of females harvested in 2019 is the highest it has been since 2008 (Figure 9). This is a result of an industry decision which has seen a reversal of the policy not to buy female macropods.

Figure 9—Queensland commercial macropod harvest sex ratio trend 1997 to 2019 (percentage of female harvest shown)



3.2 Carcass and skin harvest

The commercial harvest of macropods in Queensland is predominantly for meat products used for human consumption and pet food. The majority of macropod skins utilised for leather and fur products are sourced from meat processors. Less than 0.1% of the commercial take was harvested for their skins only in 2019 (figures 10–13). The only harvest in 2019 for skins alone was for 250 eastern grey kangaroos from the eastern zone.

Figure 10—Macropod skin and carcass harvest for Queensland in 2019

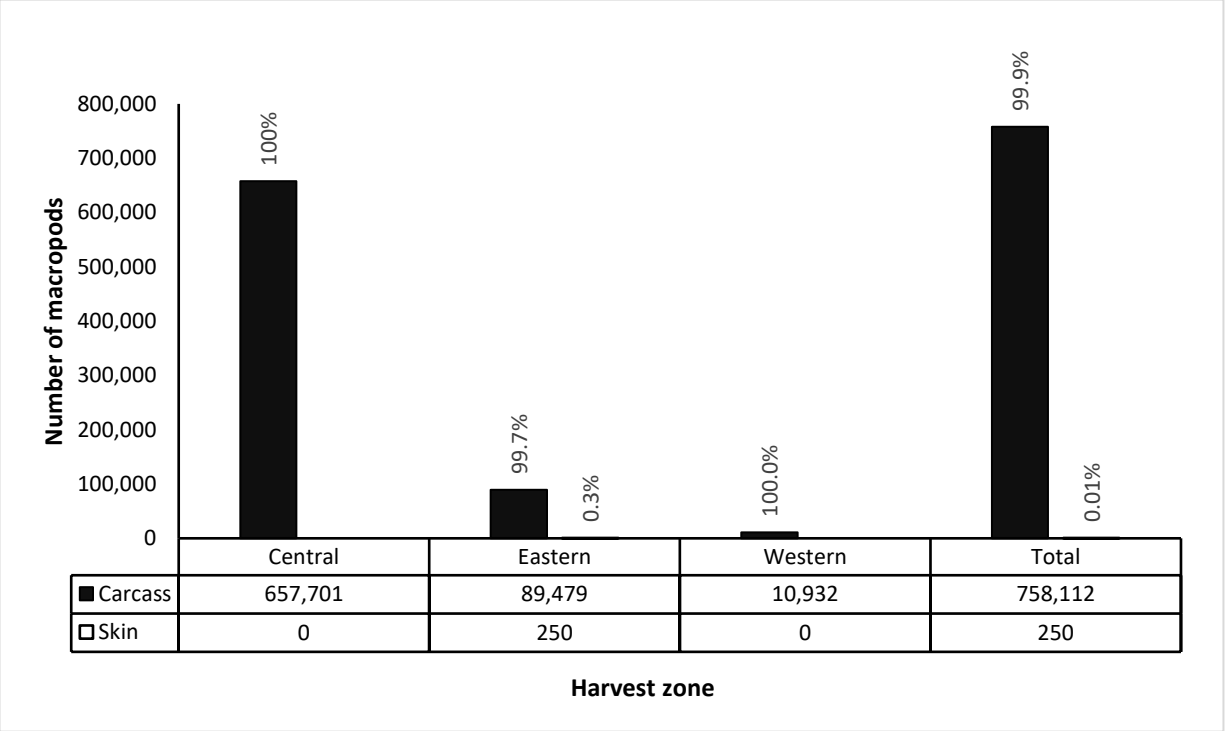


Figure 11—Skin and carcass harvest of red kangaroos in 2019

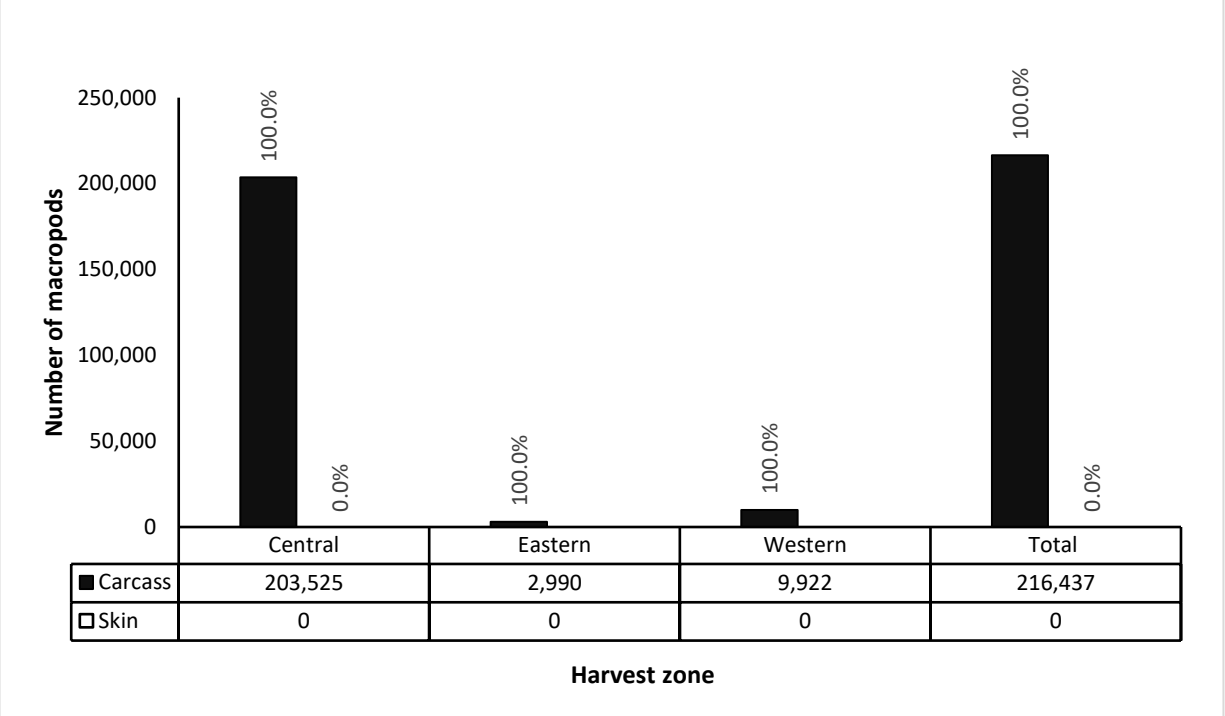


Figure 12—Skin and carcass harvest for eastern grey kangaroos in 2019

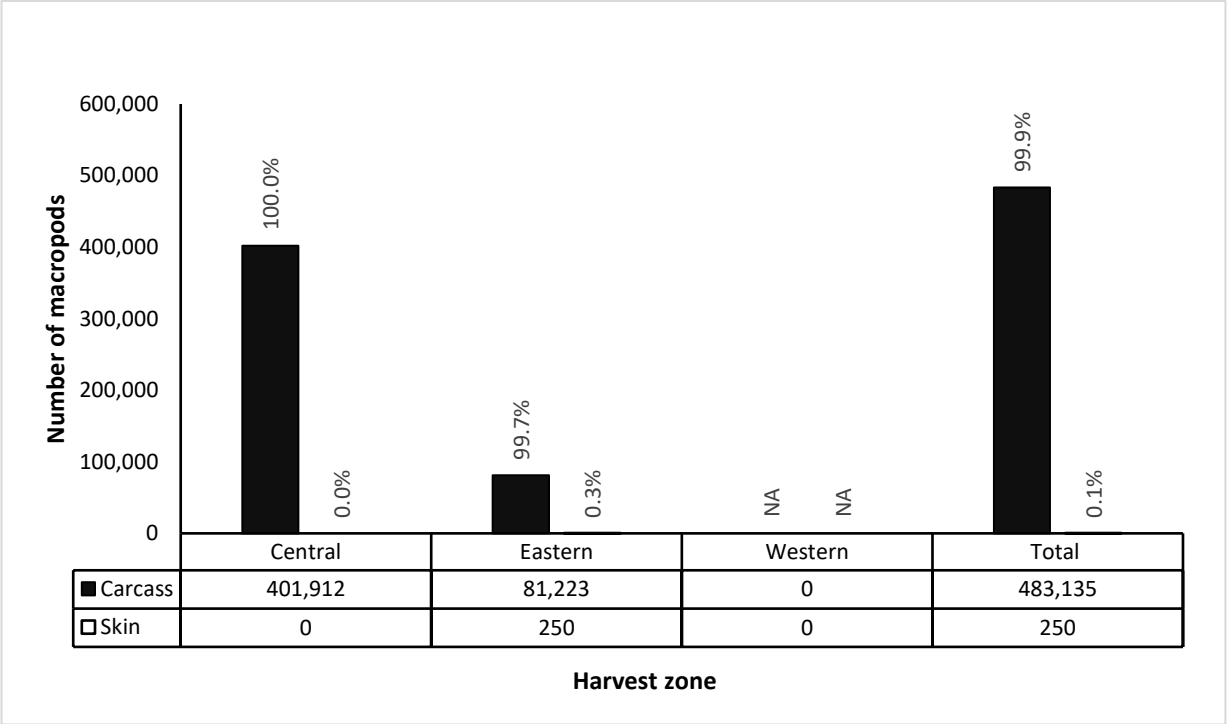
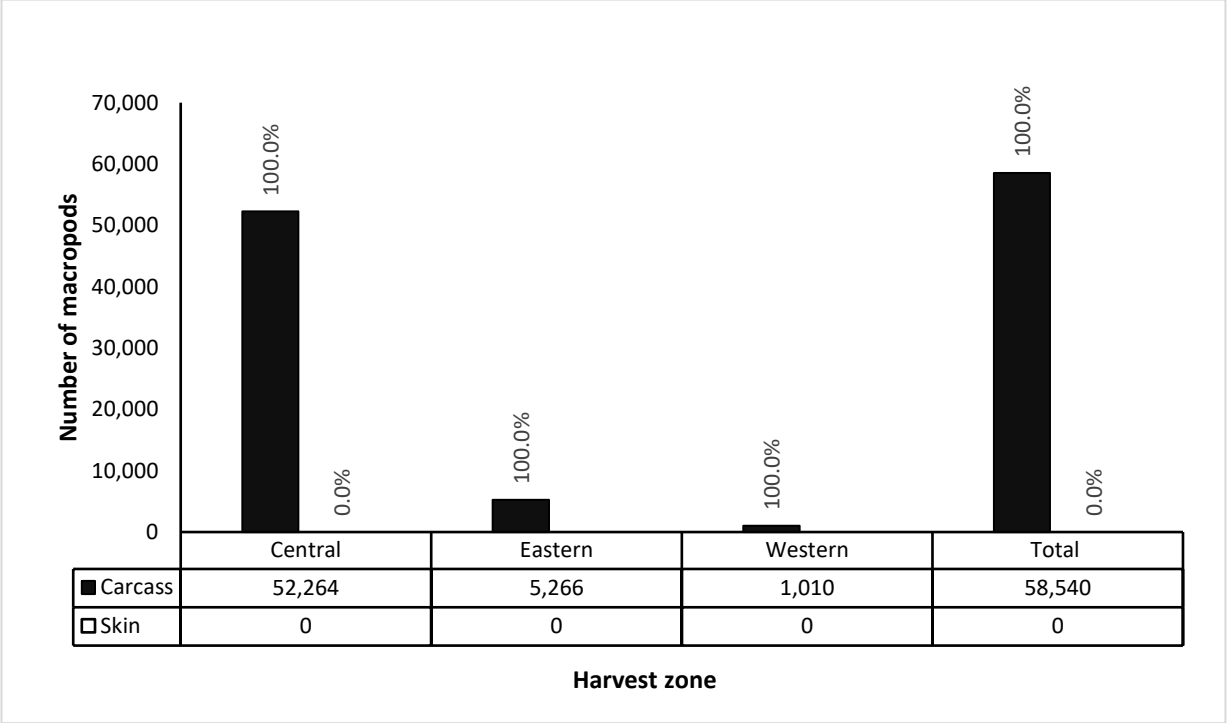


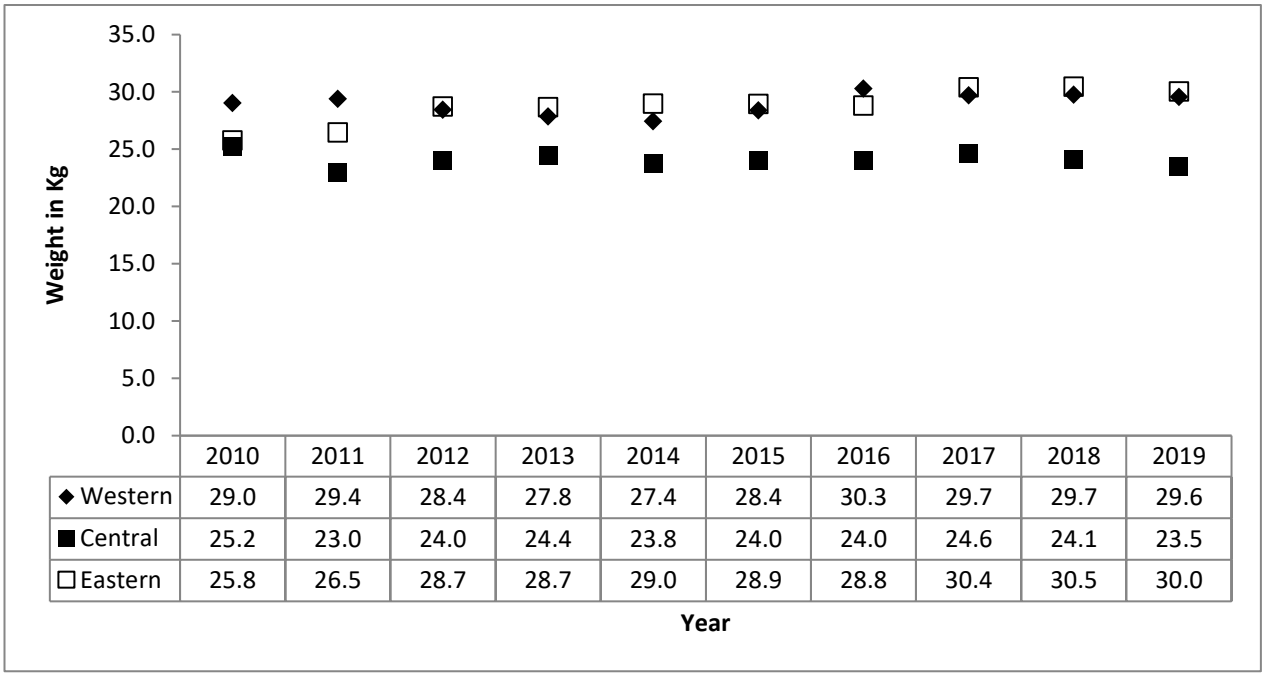
Figure 13—Skin and carcass harvest for common wallaroos in 2019



3.3 Average weight

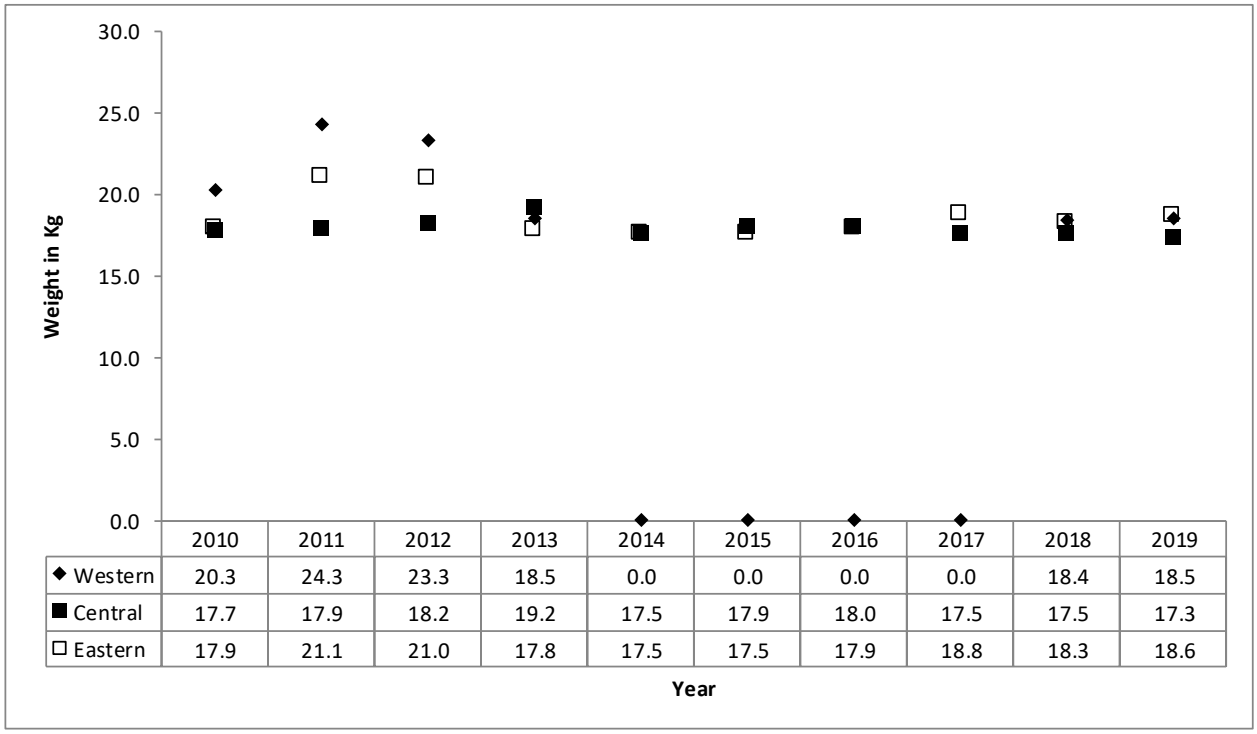
The average dressed carcass weights per harvest zone and species are shown in figures 14 to 17. Carcass weights have fluctuated slightly in the past ten years in each harvest zone with no significant increases or decreases having occurred in that time. The minimum weight of a fully dressed carcass as defined in the Harvest Period Notice was 13 kilograms (kg) during the 2019 harvest period. A number of dealer sites have established a minimum preferred dressed weight requirement between 16kg and 18kg. This is driven by economic reasons with efficiencies gained in processing heavier carcasses. Regular inspections of dealer sites and monitoring minimum carcass weights ensure the minimum weight requirement is met. Where carcasses are found that breach the minimum weight requirements, both the harvester and dealer may be issued warning or infringement notices and fined.

Figure 14—Average dressed weight of Queensland male macropod carcasses 2010–2019



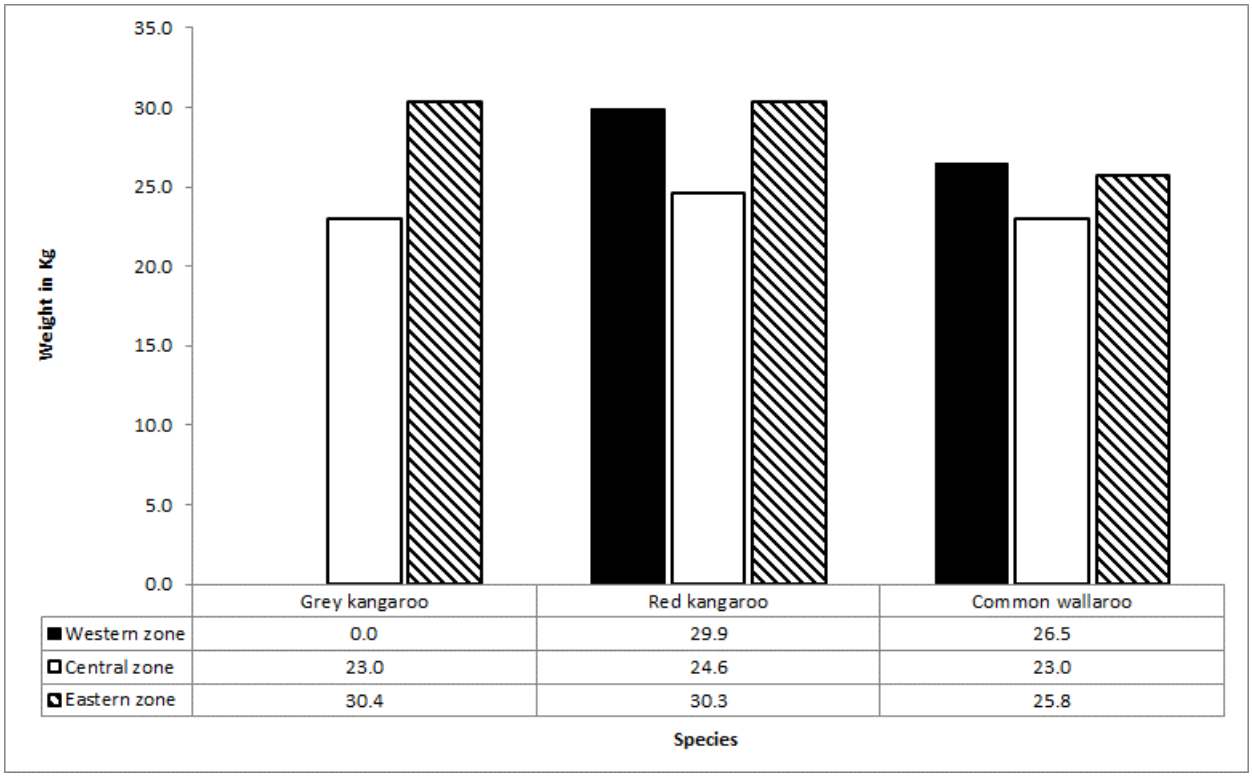
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
◆ Western	29.0	29.4	28.4	27.8	27.4	28.4	30.3	29.7	29.7	29.6
■ Central	25.2	23.0	24.0	24.4	23.8	24.0	24.0	24.6	24.1	23.5
□ Eastern	25.8	26.5	28.7	28.7	29.0	28.9	28.8	30.4	30.5	30.0

Figure 15—Average dressed weight of Queensland female macropod carcasses 2010–2019



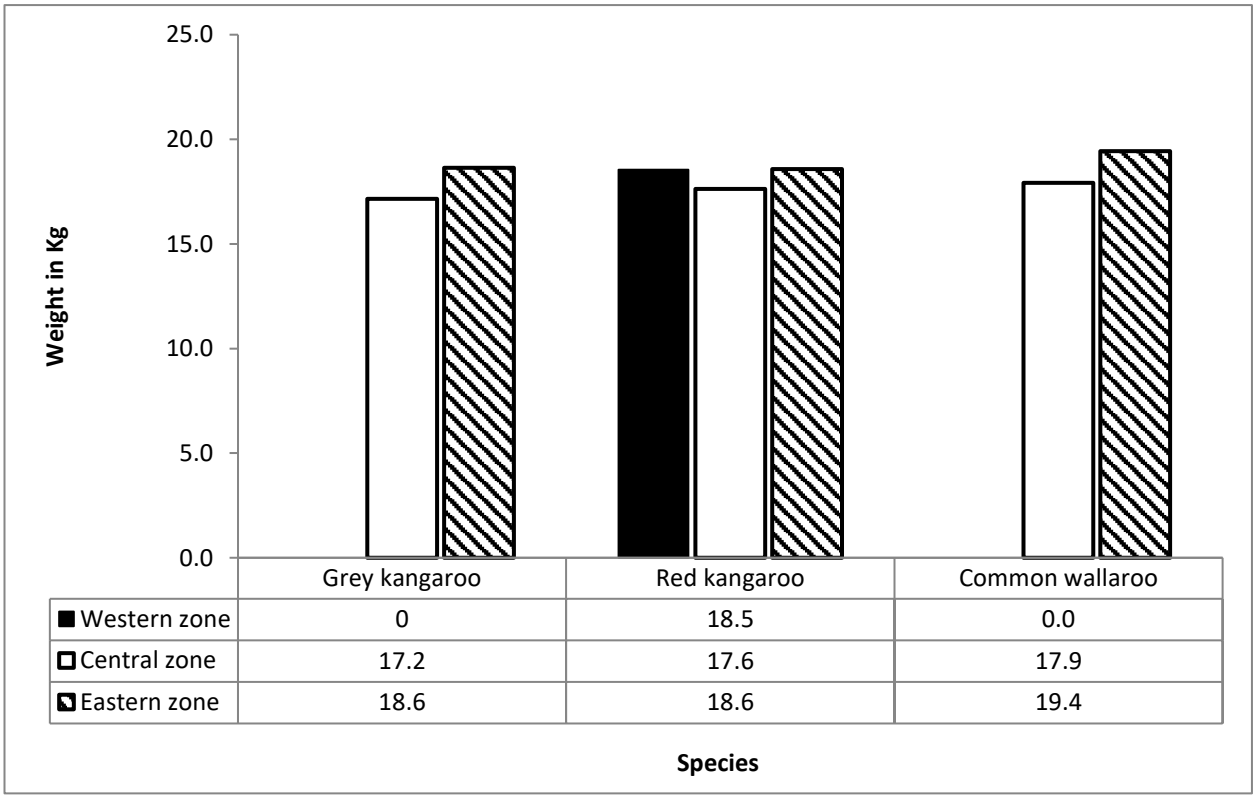
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
◆ Western	20.3	24.3	23.3	18.5	0.0	0.0	0.0	0.0	18.4	18.5
■ Central	17.7	17.9	18.2	19.2	17.5	17.9	18.0	17.5	17.5	17.3
□ Eastern	17.9	21.1	21.0	17.8	17.5	17.5	17.9	18.8	18.3	18.6

Figure 16—Average dressed carcass weight for male macropods harvested in 2019. Note there is no quota for eastern grey kangaroos in the western zone.



	Grey kangaroo	Red kangaroo	Common wallaroo
Western zone	0.0	29.9	26.5
Central zone	23.0	24.6	23.0
Eastern zone	30.4	30.3	25.8

Figure 17—Average dressed carcass weight for female macropods harvested in 2019. Note there is no quota for eastern greys in the western zone.



	Grey kangaroo	Red kangaroo	Common wallaroo
Western zone	0	18.5	0.0
Central zone	17.2	17.6	17.9
Eastern zone	18.6	18.6	19.4

4. Special quotas

No special quotas were allowed for in 2019. A special quota can only be considered once the commercial harvest quota for a particular species has been reached in a harvest zone. Situations where a special quota may be considered include where there is a high macropod population density in a particular area or where adverse weather conditions such as prolonged drought are having a detrimental effect on macropod health.

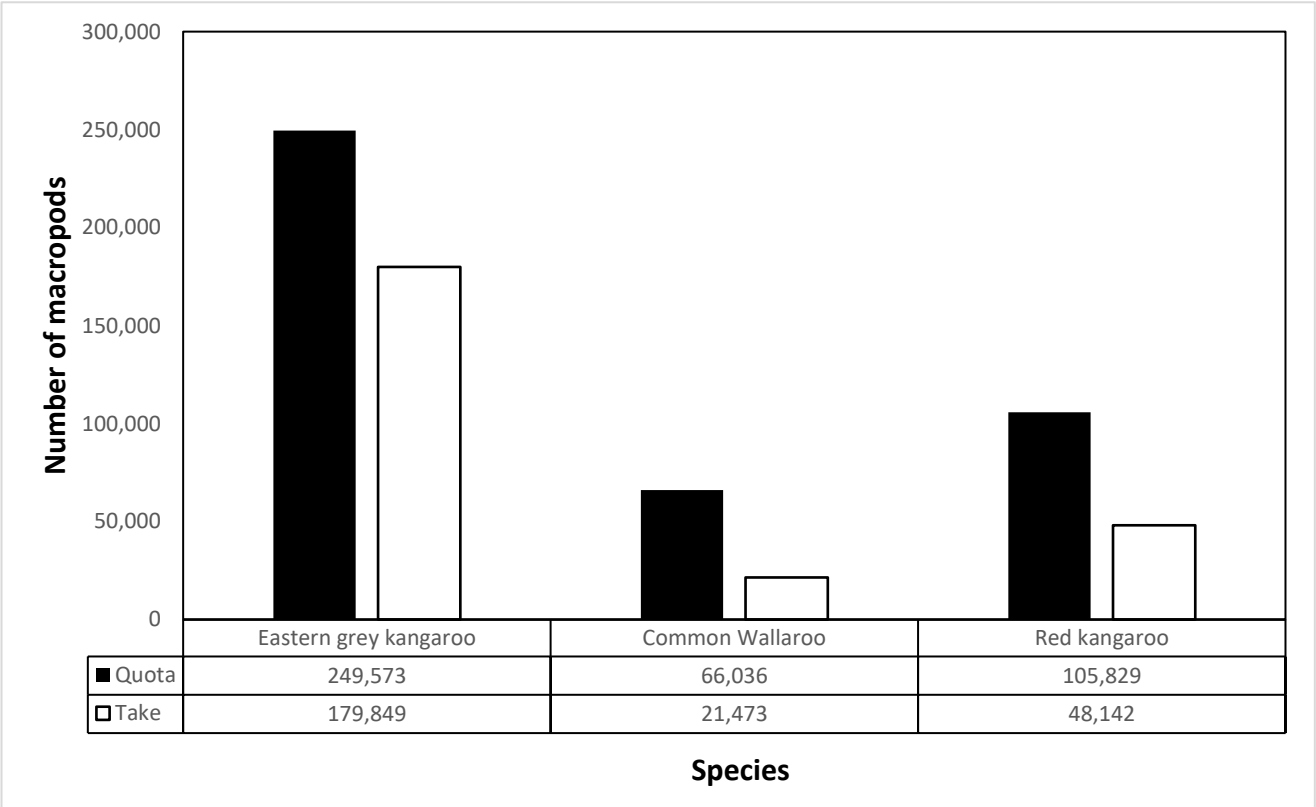
5. The extent of non-commercial harvest mortality

There are many forms of macropod mortality outside of the commercial harvest. It is possible for the department to collect and report data on two forms of non-commercial harvest mortality which can be considered when determining commercial quotas. These are damage mitigation permits (DMPs), and disease outbreak mortality.

6. Damage Mitigation Permits

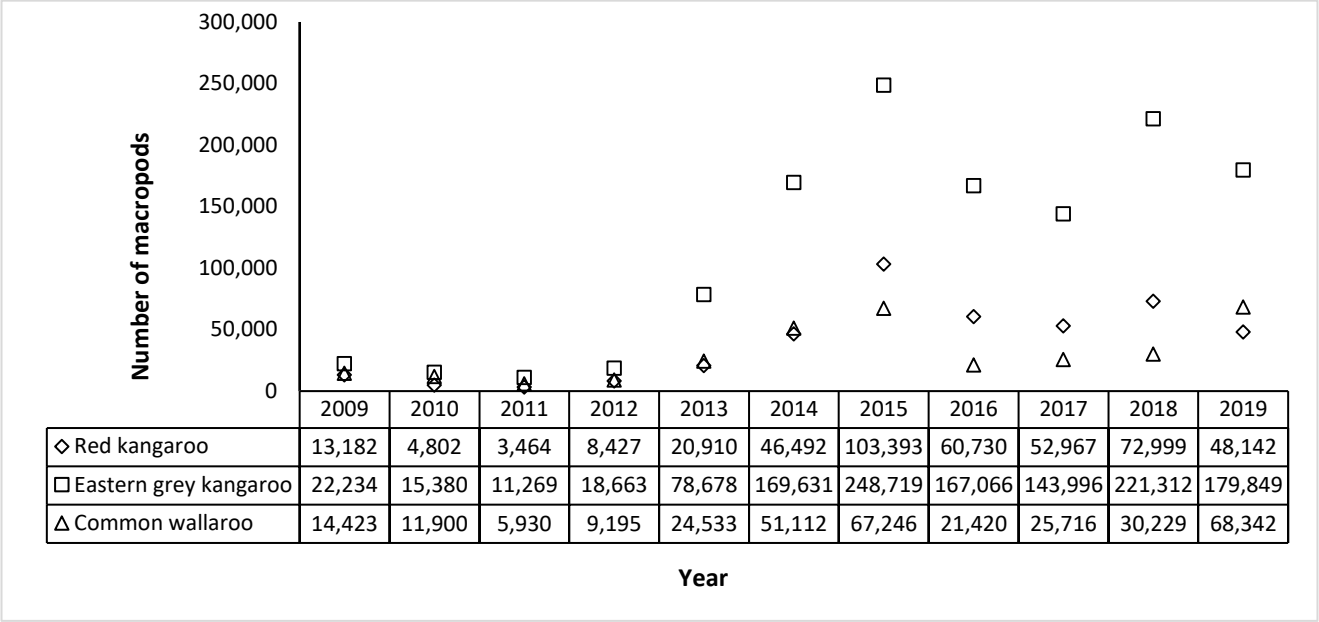
DMPs are issued by the department where macropods may cause damage or loss of property, or are a threat to human health or wellbeing. The issuing of these permits is limited to a maximum of 2% of the estimated population for each species. The total take under this permit system remains below the allowable quota (Figure 18). For comparative purposes, a summary of the macropods taken under DMPs for each species for 2008–2019 is outlined in Figure 19.

Figure 18—Macropod quota and allowable take for damage mitigation permits in 2019



	Eastern grey kangaroo	Common Wallaroo	Red kangaroo
Quota	249,573	66,036	105,829
Take	179,849	21,473	48,142

Figure 19—Macropods taken under damage mitigation permits 2008–2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
◇ Red kangaroo	13,182	4,802	3,464	8,427	20,910	46,492	103,393	60,730	52,967	72,999	48,142
□ Eastern grey kangaroo	22,234	15,380	11,269	18,663	78,678	169,631	248,719	167,066	143,996	221,312	179,849
△ Common wallaroo	14,423	11,900	5,930	9,195	24,533	51,112	67,246	21,420	25,716	30,229	68,342

7. Disease outbreak mortality

No reports of disease outbreaks in macropods across Queensland were reported during 2019.

8. Long-term population, quota and harvest trends

Since 1991, the Queensland Government has conducted an annual program of aerial surveys by helicopter to directly monitor populations of the three macropod species covered by the Queensland Wildlife Trade Management Plan for Export—Commercially Harvested Macropods 2018–2022. These surveys occur over 22 representative monitor blocks across the state and are utilised to obtain population estimates that inform the quota.

In 2011 a correction factor of 1.85 was applied to population estimates for common wallaroos in Queensland. Prior to 2011 a conservative correction factor of 1.2 was used for common wallaroos. Current harvesting rates (quotas ranging from 10 to 20% of population estimates) are considered sustainable (Caughley et. al. 1987, Hacker et. al. 2002). None of the three commercially harvested species has shown a consistent decline in abundance since 1992 (Figure 20) which would require a reassessment of the harvest take and species conservation status. Whilst no consistent declines have been observed, the macropod populations in Queensland have fluctuated over time. Of these species, the eastern grey kangaroo is consistently the most abundant across the harvest zones, followed by the red kangaroo. Common wallaroos are the lowest. All three species occur in numbers of over 1,000,000 across the harvest zones.

Figures 20–23 below outline data on the three commercially harvested macropod species pertaining to population, commercial harvest quota and macropods commercially harvested and sold for the years 1992–2019. It should be noted that harvest quotas are calculated from population estimates based on aerial surveys conducted in the previous year to the harvest. Combined population estimates, quota and harvest data have been used for the period post-regionalisation to enable comparison with data collated prior to this period. As quotas are set as a constant proportion of the populations, they fluctuate as populations fluctuate, however, numerous factors influence harvest rates for commercial macropods. These include population levels, market forces, environmental conditions and access by harvesters. As a consequence, there is no clear pattern or trend in the proportion of the quota harvested since 1992.

Figure 20—Estimated macropod populations in the Queensland commercial harvest zones 1992–2019

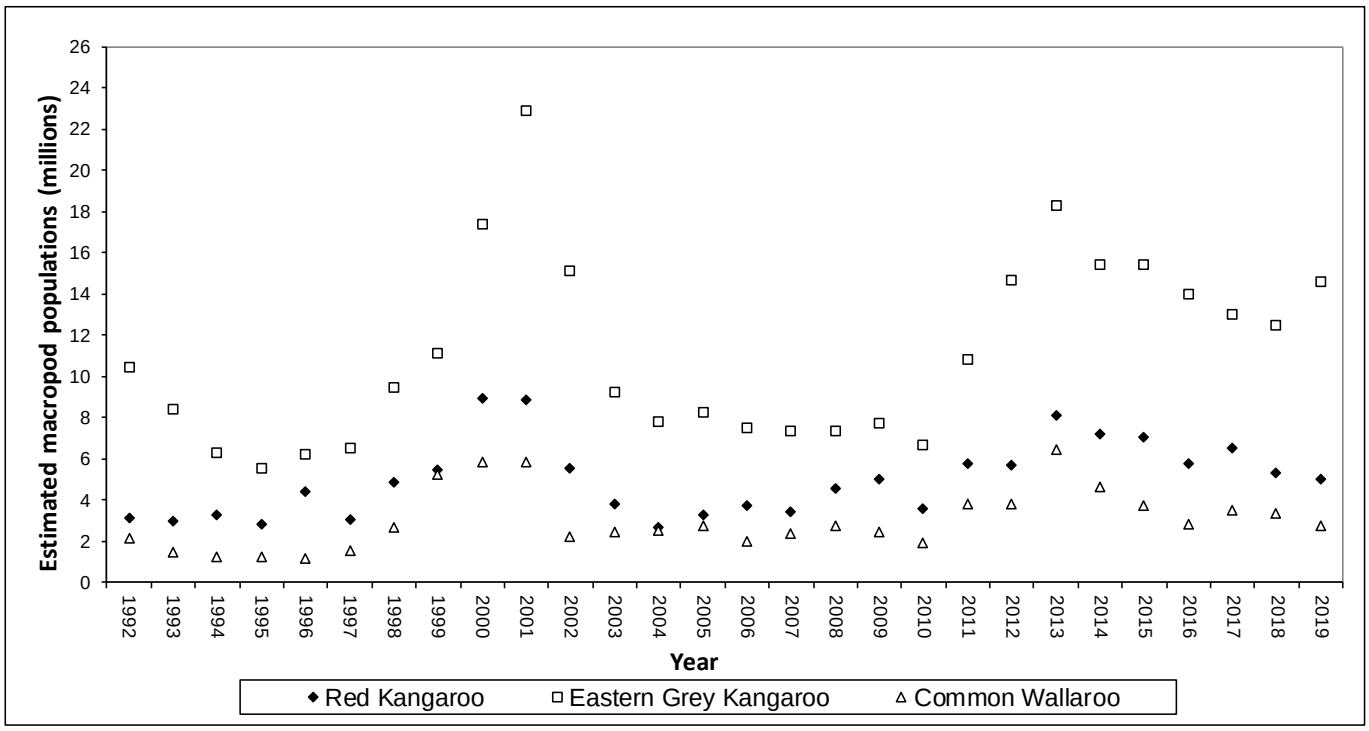


Figure 21—Long-term estimated populations (± SE), commercial harvest quotas and actual harvest of red kangaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year

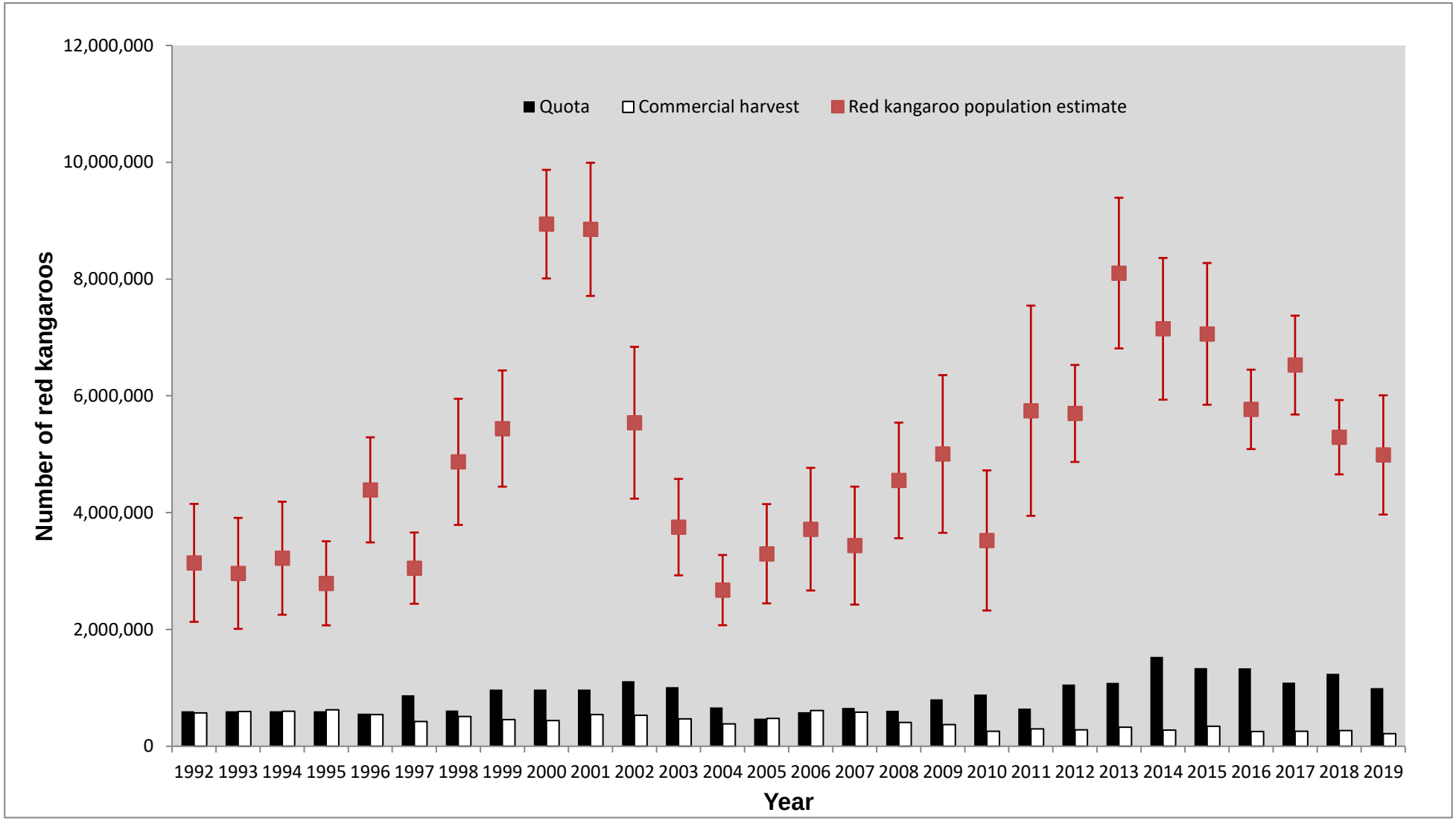


Figure 22—Long-term estimated populations (± SE), commercial harvest quotas and actual harvest of eastern grey kangaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year

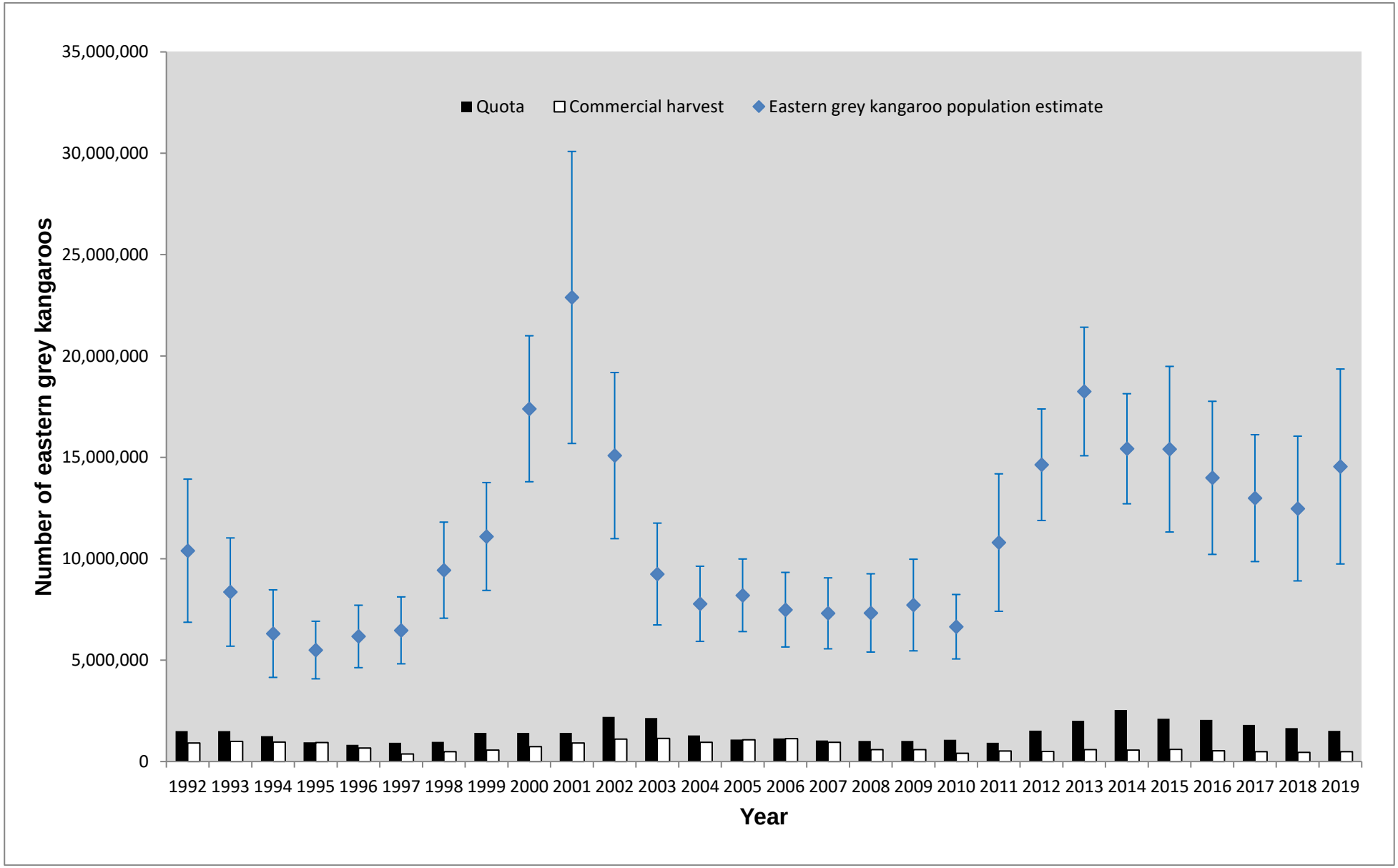
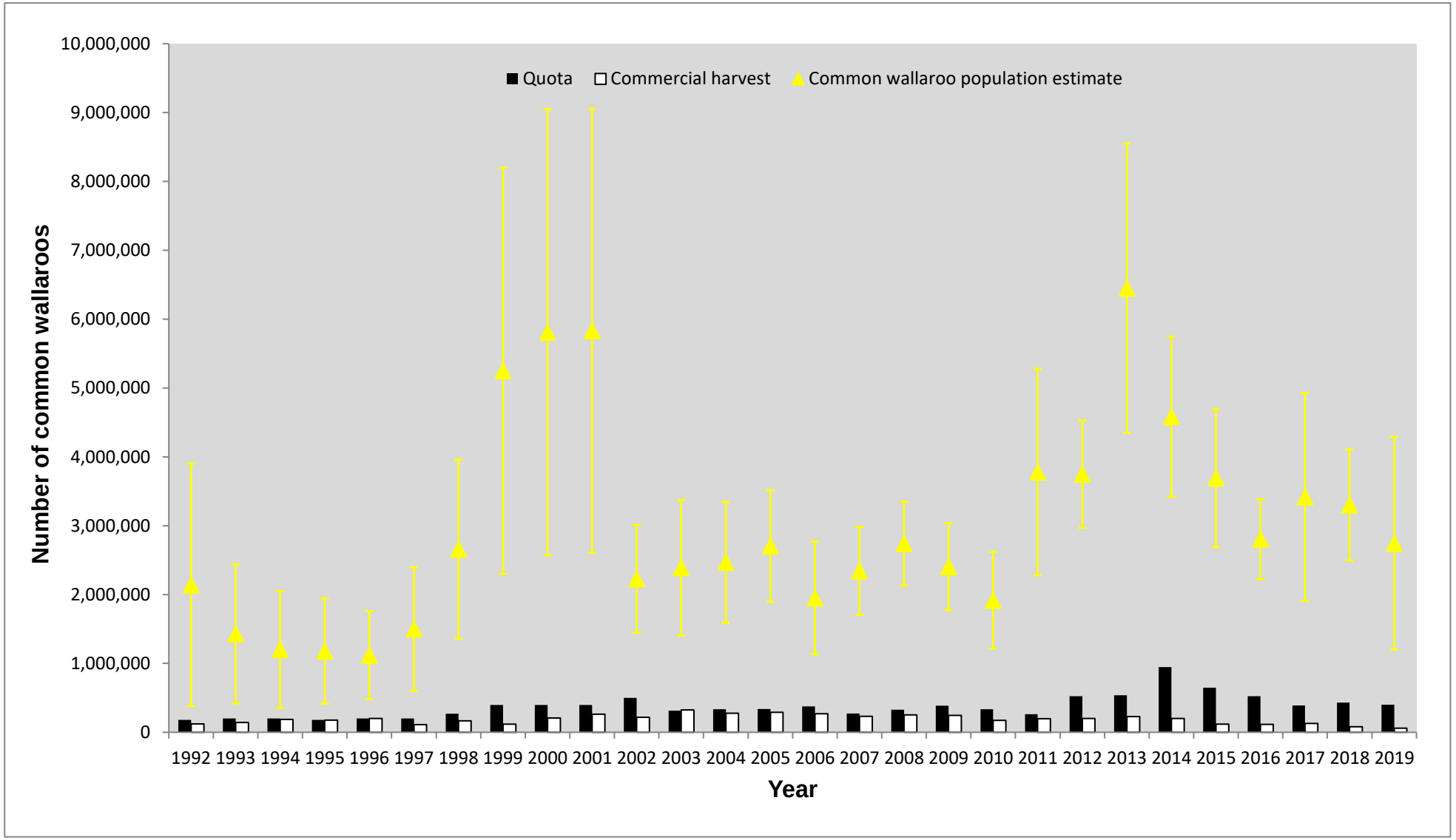


Figure 23—Long-term estimated populations (± SE), commercial harvest quotas and actual harvest of common wallaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year



9. Compliance

During the 2019 harvest period, inspections of dealer sites, processor sites and harvesters were completed state wide. Overall compliance was considered good. Inspections were targeted towards higher risk sites.

The commercial harvest of macropods in Queensland requires compliance, investigation and enforcement resources. Compliance activities are conducted both infield and through desktop auditing. There are two compliance officers authorised under the *Nature Conservation Act 1992* within the Macropod Management Unit. The majority of commercial macropod harvest field compliance activities are undertaken by these officers; however the department undertakes collaborative compliance work with wildlife rangers, the Queensland Police Service, and Safe Food Production Queensland (SFPQ).

Other compliance activities are conducted by the Macropod Management Unit including licence audits, harvest return analysis, report compilation and licence application assessment. Licensees are assessed at time of application against suitability criteria. These include accrual of 10 or more demerit points, convictions against the *Nature Conservation Act 1992* or any other matters relevant to the person's ability to carry out the activities authorised by the licence in a competent and ethical way.

Compliance priorities for the 2019 harvest period were:

- Harvesters hold the appropriate licence.
- Macropods are correctly tagged with a valid 2019 harvest period tag.
- Macropods are tagged with the correct species/zone tag.
- Prohibited (non-head-shot) macropods are not traded.
- Compliance with the National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes 2008.
- Harvesters produce/carry valid written landholder consent as per licence conditions.
- Ensure timely, complete and accurate harvest returns.

The integrity of a quota relies upon the premise that tags are not reused or applied to the wrong species or used in the wrong harvest zone. To objectively and adequately demonstrate effective compliance levels, an inspection target of 1% of the overall harvest; with 10% of the sample inspected at a detailed level has been established.

9.1 Inspections

The department conducted both programmed and unannounced inspections of harvesters, dealers and processors. During the 2019 harvest period, officers conducted 38 licensed dealer site inspections as well as 10 licensed processor site inspections and 22 harvester inspections. Other complaints and evidence of non-compliance were also investigated.

Throughout the harvest period, inspection targets were a minimum of 1% of the harvest being visually inspected and 0.1% of the harvest being inspected in detail. The inspection targets of 1% and 0.1% were met, with 1.7% of the total harvest visually inspected and 0.14% of the harvest inspected in detail (Table 6). All operating processor sites were inspected during the 2019 harvest period. In addition to planned inspections, compliance officers investigate reports of illegal harvesting to the fullest extent possible.

Table 6—Inspection targets

	Inspection target	**Inspections conducted**
Visual inspection—1% of overall harvest	7,584– (1%)	13,410 - (1.7% of harvest)
Detailed inspection of 0.1% of harvest	759– (0.1%)	1,055- (0.14% of harvest)

9.2 Compliance and enforcement measures

Breaches of legislation are subject to enforcement action such as warning notices, fines, licence cancellation and prosecution.

Enforcement action is taken in accordance with the department's enforcement guidelines. Written warnings or infringement notices are given at the discretion of compliance officers, in accordance with the department's enforcement guidelines and in consultation with the Manager. Decisions on possible prosecutions involve consultation with the Manager and department's litigation unit.

During the 2019 harvest period, a total of three infringement notices and 118 warning notices were issued (Table 7). No licences were cancelled for breaches of legislation during the 2019 harvest period.

Department officers did not seize any items for breaches of the Act during the 2018 harvest period.

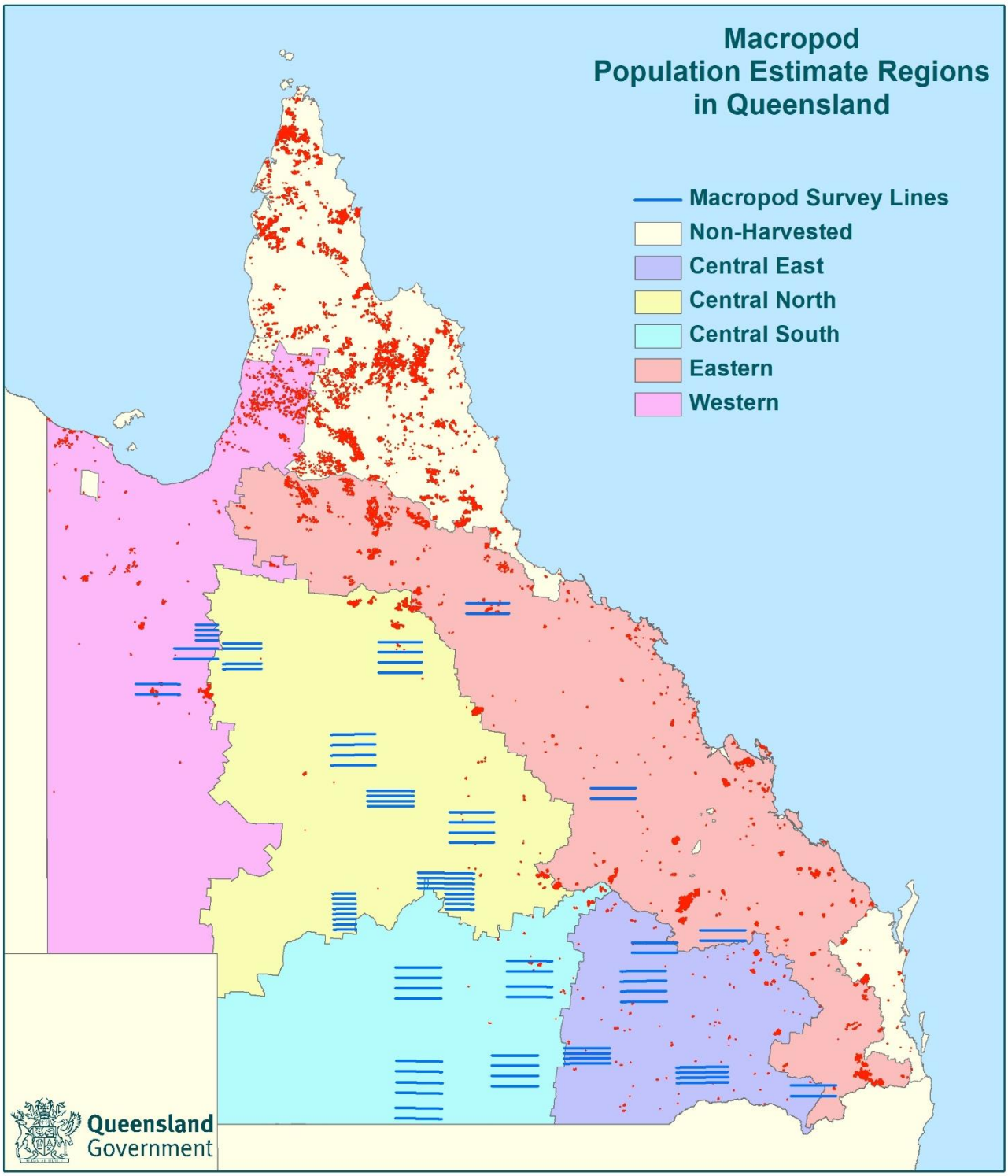
Table 7—Detail of offences during 2019

Dealer	**PIN**	**Warning**
Fail to give return for each period/by prescribed time. CWL		1
Keep/use lawfully taken protected wildlife without lawful authority.		1
Harvester		
Fail to comply with condition of authority.		8
Fail to comply with weight requirement in harvest period notice for macropod taken for meat only or meat and skin.		1
Fail to give return of operations for each month of the harvest period/by prescribed time. CWHL		100
Fail to properly attach a tag immediately after macropod is dressed.		3
Failure to keep record at prescribed place.		2
Failure to record relevant particular within prescribed time.		1
Failure to show authority or identification without reasonable excuse.		1
Keep, use, sell or give away a prohibited macropod.	3	
Total	3	118

10. Climate

Whilst the northern tropics and parts of the north west of Queensland received above average rainfall during 2019 the climate across most of the macropod harvest zones was dominated by hot, dry conditions. Most Local Government Areas within harvest zones experienced the seventh year of drought. Large areas of the inland south east recorded their driest year on record. Average temperatures recorded throughout spring were hot with very low humidity leading to dangerous fire conditions particularly in the south east of the state. Fire became a dominant feature of weather reports from September onwards through to January (Bureau of Meteorology 2020). Whilst devastating to local areas burnt the vast majority of the Queensland macropod harvest zones were unaffected by the disaster (Figure 24).

Figure 24— Map of Queensland harvest zones showing fires recoded between 1 October 2019 and 16 January 2020



11. Research and experiments

No significant research projects involving commercially harvested macropods were undertaken during 2019 in Queensland. However the Macropod Management unit continued trialling imaging hardware for the automated counting of macropods in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO). This work will continue during 2020.

The department continues to respond to requests for data from researchers and other stakeholders as they arise.

12. Program improvements

The National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes 2008 (the code) sets the standard of humane conduct required of licence holders shooting macropods. A review of the code started in 2018 and continued throughout 2019. The review is being led by AgriFutures Australia through an appointed consultant and project reference group. The reference group has representatives from Australian, state government authorities responsible for kangaroo management, the kangaroo and pastoral industries, the Australian Veterinary Association and RSPCA. The Queensland Macropod Management Program represents states with a commercial harvest on the reference group. Public consultation of the revised commercial code ran for 28 days beginning on the 25th November 2019. It is expected the new code will come into effect during 2020.

The Macropod Management Program completed the trial of methods and feasibility for inspecting skulls of recently harvested macropods. The purpose of this trial, begun in 2018, was to assess the feasibility of inspection methods as an additional compliance activity to identify breaches of the code and detect other compliance issues. Three methods of inspecting dressing sites were trialled on site within hours of harvesting taking place and identified no breaches of the code or legislative requirements. One method of site inspection was identified as the most successful for inspecting recently harvested skulls for noncompliance with the code of practice.

During 2017, the department implemented a new online licencing system across all business areas. The system provides customers with the ability to apply for permits and order macropod items (tags and return books) online. Continual upgrades to the online portal occurred throughout 2019 with further extended capabilities anticipated for release during the 2020 harvest period. Whilst a paper based system of applying for licences and tags is still available over 40% of macropod program clients are now using the online portal.

13. References

Anon. 2017. Queensland Wildlife Trade Management Plan for Export – Commercially Harvested Macropods – 2018–2022. Queensland Parks and Wildlife Service; Brisbane.

Bureau of Meteorology, 2020, Annual Climate Summary for Queensland, http://www.bom.gov.au/climate/current/annual/qld/archive/2018.summary.shtml, accessed February 2019.

Caughley, G., Shepard, N. and G. Short. 1987. Kangaroos, their ecology and management in the sheep rangelands of Australia. Cambridge University Press; Cambridge.

Hacker, R., McLeod, S., Druhan, J., Tenhumberg, B. and U. Pradhan. 2002. Managing Kangaroos in the Murray-Darling Basin. Technical Report to the Murray-Darling Basin Commission; Canberra.

Appendix 1

Queensland Wildlife Trade Management Plan for Export—Commercially Harvested Macropods 2018–2022, performance indicators

Aim	Action	Performance indicator	Progress in 2019
Aim 1. Manage and administer commercial operators via licensing.	**Action 1.**1 All relevant activities are licensed in accordance with the applicable Queensland legislation and department policy.	**1.1.1** All licences across Queensland are assessed, processed and issued appropriately in accordance with Queensland legislation.	Achieved.
		1.1.2 Databases are maintained to ensure licensee information is current and accurate.	Achieved.
	Action 1.2—Licence conditions are applied where required.	**1.2.1.** Licence conditions are imposed on licences where required and in accordance with Queensland legislation.	Achieved.
		1.2.2. Information notices explaining conditions and rights of review are provided with all licences with licence conditions.	Achieved.
Aim 2. Monitor macropod populations and set quotas.	**Action 2.1**. Populations within the commercial harvest zones will be estimated annually based on aerial surveys.	**2.1.1.** Macropod population estimates are obtained annually via aerial surveys throughout the life of this plan.	Achieved.
	Action 2.2. Commercial macropod harvest quotas will be set in accordance with the provisions of this plan.	**2.2.1.** All commercial macropod harvest quotas are set in accordance with the provisions of the plan.	Achieved.
		2.2.2. The Commonwealth Government is advised of commercial harvest quotas for the following calendar year by 30 November.	Achieved.
		2.2.3. If Commonwealth approval is required for quotas set above the rates specified in this plan as part of an adaptive management experiment, such approval is obtained before the additional quota is implemented.	NA
		2.2.4. The quota report is made available to the public via the department's website.	Achieved.
	Action 2.3. Special macropod harvest quotas will be set in accordance with the provisions of this plan.	**2.3.1**. Special macropod harvest quotas are set and utilised in accordance with the provisions of this plan.	NA
	Action 2.4. Macropod populations will be monitored indirectly throughout the life of this plan.	**2.4.1.** Where a harvest zone showed greater than 40 per cent female harvest, then appropriate management action would be taken.	NA
	Action 2.5. Annual population estimates for commercially harvested macropod species will be assessed against predetermined trigger	**2.5.1.** Where an estimated population for a population estimate region within the Central harvest zone falls below a set trigger point of 1.5 standard deviations below the long term average for that region then the harvest quota will be reduced for that region in the next calendar year.	Achieved

Aim	Action	Performance indicator	Progress in 2019
	points in each population estimate region.	**2.5.2.** Where an estimated population for a population estimate region within the Central harvest zone falls below a set trigger point of two standard deviations below the long-term average for that region then the harvest quota will be further reduced or suspended for that region in the next calendar year.	NA
		2.5.3. Where an estimated population in the Western or Eastern zones falls below a set trigger point of 1.5 standard deviations below the long term average then the harvest quota will be halved for that zone in the next calendar year. When the estimated population exceeds a trigger point of two standard deviations below the long term average for that zone then the harvest quota will be suspended for that zone in the next calendar year.	Achieved.
Aim 3. Ensure humane treatment of commercially-harvested macropods.	**Action 3.1**. The department will work with TAFE Queensland South West or other accredited provider to ensure that all potential harvesters are competent to achieve the standards set out in the code of practice before being issued a license.	**3.1.1.** All successful applicants for harvester's licences have completed the approved training course and the approved shooting test.	Achieved.
		3.1.2. Approved course of training is reviewed and revised if necessary during the life of this plan.	Achieved.
		3.1.3. The code of practice is provided to all new applicants when they receive their licence and is available on the department website.	Achieved.
	Action 3.2. The department will monitor compliance with the code of practice by commercial macropod industry operators.	**3.2.1.** All licensees who are found to have breached licence conditions in relation to animal welfare are issued with warning notices, PINs or are prosecuted as appropriate.	Achieved.
	Action 3.3. The department will contribute to nationally-focused research in improving animal welfare outcomes, if requested.	**3.3.1.** Research proposals from universities and other research institutions concerned with the welfare aspects of the commercial harvest of macropods are considered during the life of this plan. Assistance to such research will be provided where appropriate.	Achieved.
Aim 4. Monitor macropod industry compliance.	**Action 4.1.** The department will undertake both regular and opportunistic monitoring of compliance by commercial macropod industry operators.	**4.1.1.** A minimum of one per cent of harvested macropods are inspected by departmental staff to ensure compliance with Queensland legislation and licence conditions.	Achieved.
		4.1.2. During the life of this plan all macropod processing works in Queensland are inspected by department staff annually and dealer sites are inspected opportunistically to ensure compliance with Queensland legislation and licence conditions.	Achieved.
		4.1.3. During the life of this plan, harvester's vehicles loaded with macropod carcasses are inspected opportunistically to ensure compliance with Queensland legislation and licence conditions and the results of these inspections are documented.	Achieved.

Aim	Action	Performance indicator	Progress in 2019
	Action 4.2. Activities not in accordance with Queensland legislation and Queensland Wildlife Trade Management Plan 2018–22 will be investigated and where an offence has been committed, and it is appropriate, prosecute.	**4.2.1.** Reports of unlicensed activities and activities in breach of legislation are investigated to the fullest extent possible, and where sufficient evidence is available offenders are issued with warning notices or PINs or prosecuted as appropriate.	Achieved.
	Action 4.3. The accuracy of industry returns will be continually monitored during the life of this plan.	**4.3.1.** During the life of this plan, incoming industry returns are scrutinised and discrepancies are investigated and resolved.	Achieved.
	Action 4.4. A compliance database will be maintained to support investigations, inspections and audits.	**4.4.1**. A compliance database of investigations, inspections and audits is maintained.	Achieved.
Aim 5. Undertake program reporting and review**.**	**Action 5.1.** An annual report on the Queensland Wildlife Trade Management Plan 2018-22 will be prepared and submitted to the Commonwealth.	**5.1.1.** An annual report on the operation of the Queensland Wildlife Trade Management Plan 2018–22 for each calendar year is submitted to the Commonwealth Government by the end of March of the following year.	Achieved.
		5.1.2. All annual reports prepared during the life of this plan are available on the department's website.	Achieved.
	Action 5.2. The review of this plan will commence no later than 12 months prior to the expiry of this plan in order to assess the success of the plan in achieving its goal.	**5.2.1.** The Queensland Wildlife Trade Management Plan 2018–22 will be reviewed no later than 12 months prior to the expiry of this plan.	NA.
		5.2.2. The success of the current plan in achieving its goal is assessed by measuring the aims against the performance indicators.	NA
		5.2.3. The results of the plan review are presented to the Commonwealth no later than six months prior to the expiry of this plan.	NA
Aim 6. Facilitate adaptive management and research.	**Action 6.1.** The department will respond to changes as they arise. Changes made to the management program will be communicated to all relevant stakeholders.	**6.1.1.** Changes to the macropod management program will be communicated to relevant stakeholders via the department’s website and directly to stakeholders where appropriate.	Achieved.
	Action 6.2. The department will facilitate research into the ecology and harvest management of macropods.	**6.2.1.** Research proposals from universities and other research institutions concerned with the ecological aspects of the commercial harvest of macropods are considered during the life of this plan. Assistance to such research will be provided where appropriate.	Achieved

Aim	Action	Performance indicator	Progress in 2019
Aim 7. Promote community awareness and participation.	**Action 7.1.** Relevant public documents will be made available on the department's website.	**7.1.1.** Throughout the life of this plan, the department's website contains the following information as a minimum standard: – current and previous wildlife trade management plans – monthly tag issue and commercial harvest statistics – historical harvest statistics – population survey reports – current population estimates – current commercial quotas – contact information for the Macropod Management Unit – current forms for commercial macropod licences.	Achieved.
	Action 7.2. Publicly available information will be provided to interested parties on request.	**7.2.1.** Publicly available macropod management information is distributed to interested parties as soon as practicable after such a request.	Achieved.
	Action 7.3. Where appropriate, relevant macropod management program staff will participate in media interviews and prepare media releases.	**7.3.1.** Departmental staff participate in interviews with the media where appropriate.	Achieved.
		7.3.2. Media releases are prepared when appropriate for issues of interest to the community such as population surveys and the release of the quota for the next calendar year.	Achieved.
	Action 7.4. Relevant information regarding licensing arrangements will be developed as required and made available to all licensees.	**7.4.1.** A copy of the current Harvest Period Notice and code of practice is made available to harvesters and dealers throughout the life of this plan to ensure that licensees are aware of relevant licensing requirements and responsibilities.	Achieved.