

Queensland Commercial Macropod Management Program

Annual Report 2021



Artwork by Adrian Combarngo, proud Mandandanji and Kamilaroi man.

The Department of Environment and Science acknowledges the Country and people of Queensland's First Nations. We pay our respect to Elders, past, present and emerging. We acknowledge and thank First Nations people for the enduring relationship connecting people, Country and ancestors—an unbreakable bond that safely stewarded and protected the land, waters and sky for thousands of generations



**Queensland
Government**

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March 2022

Preface

This annual report summarises the activities of the Commercial Macropod Management Program in Queensland for the period 1 January 2021 to 31 December 2021. 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 2021 harvest period, there were 1,000 macropod harvesting licences issued. There were 87 dealer licences for dead macropods, which included 8 dealer licences for dead macropods (meat processing) and one dealer licence for dead macropods (tanning) current. Data from dealer returns, entered up to 10 March 2022, indicates that there were 601,164 macropods commercially harvested and sold, representing 30.3% of the overall quota. The harvest was entirely for carcasses used for both human consumption and pet food.

No quota was exceeded for any species in any harvest zone in 2021. The highest percentage use of quota was for common wallaroos in the central zone at 62.2%. In all harvest zones, the percentage of the population used for each species was less than 7%.

The commercial harvest is typically biased towards males due to their generally larger size and weight when compared to females. For 2021 the harvest for each species was biased towards males by 72.7% or greater.

During the 2021 harvest period, the department issued 9 infringement notices and 190 warning notices for offences relating to the commercial macropod harvest.

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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 (*Osphranter rufus*)
- eastern grey kangaroo (*Macropus giganteus*)
- common wallaroo (*Osphranter 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 (Animals) Regulation 2020*.

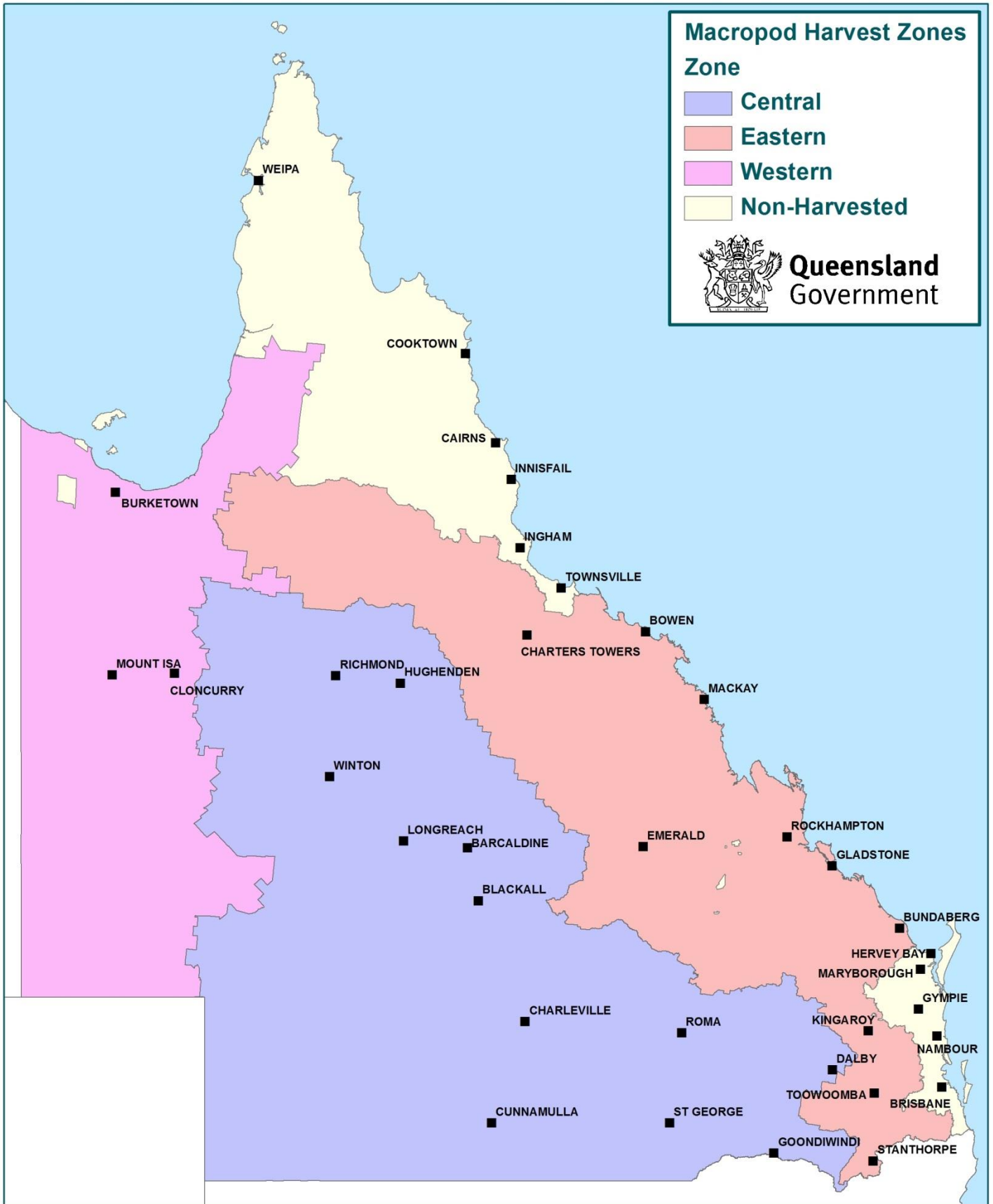
The harvesting of these macropods is regulated through or with consideration to the:

- *Nature Conservation Act 1992*
 - *Nature Conservation (Animals) Regulation 2020*
 - *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 2021



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 2021 to 31 December 2021. 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 (Animals) Regulation 2020* which 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 single use, tamper evident numbered 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 2021 harvest period, 1,000 macropod harvesting licences were issued. There were 87 dealer licences for dead macropods, which included eight dealer licences for dead macropods (meat processing) and one dealer 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 100% for common wallaroos, in the central zone. The actual harvest for this species in this zone was 62.2% of available quota. 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 2021

Tag categories by zone	2021 quotas	Tags sold		Reported harvest	
		Number of tags	% of quota	Number of macropods	% of quota
Central zone					
Eastern grey kangaroo	468,000	241,950	51.7	206,009	44.0
Red kangaroo	608,450	264,250	43.4	227,594	37.4
Common wallaroo	19,300	19,300	100.0%	12,009	62.2
Eastern zone					
Eastern grey kangaroo	619,450	138,200	22.3	109,442	17.7
Red kangaroo	21,150	18,050	85.3	12,234	57.8
Common wallaroo	169,200	16,500	9.8	8,951	5.3
Western zone					
Red kangaroo	43,450	29,050	66.9	23,415	53.9
Common wallaroo	32,150	2,750	8.6	1,510	4.7
Total	1,981,150	730,050	36.8	601,164	30.3

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 March 2022, indicates that there were 601,164 macropods commercially harvested and sold, representing 30.3% 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 601,164 animals harvested, there were 263,243 red kangaroos, 315,451 eastern grey kangaroos and 22,470 common wallaroos harvested (Figure 3).

Figure 2—Commercial harvest in local government areas during the 2021 harvest period

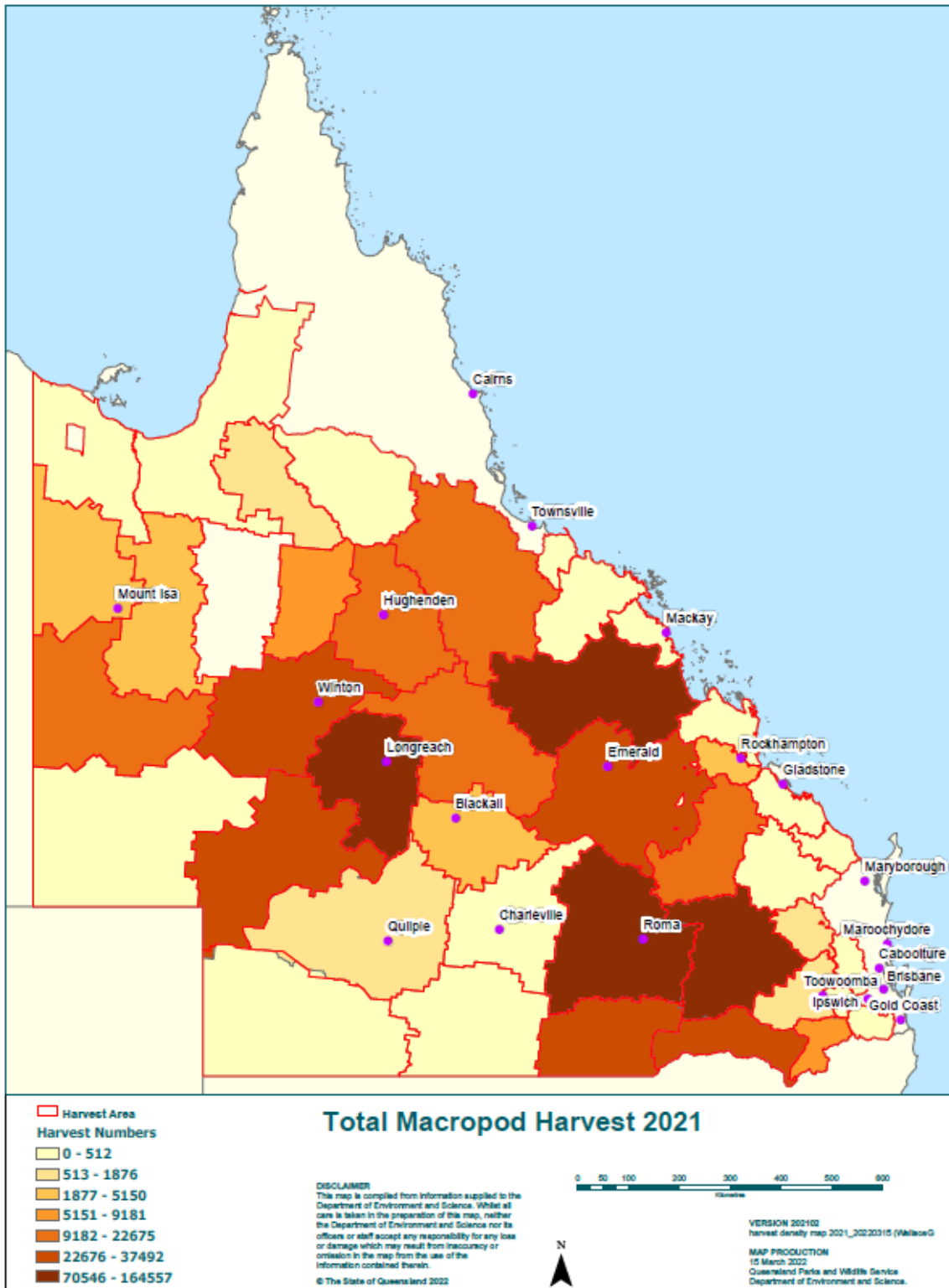
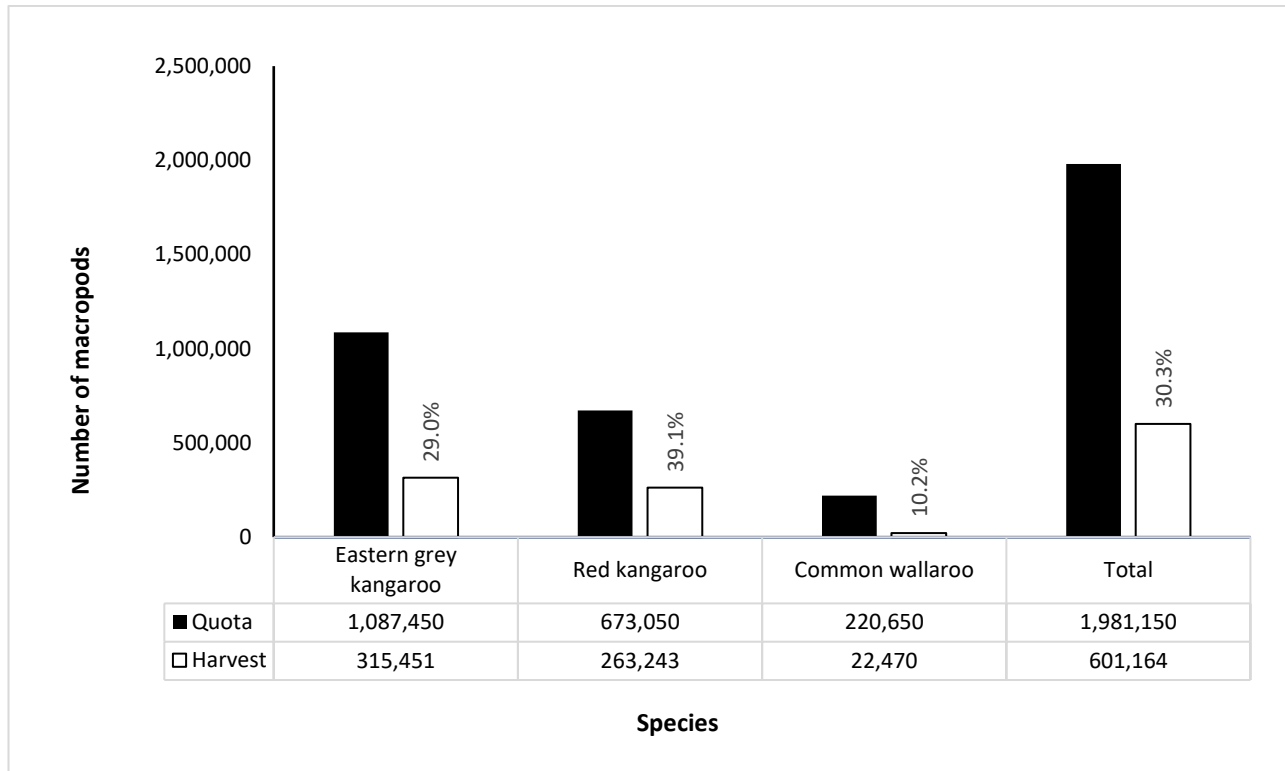
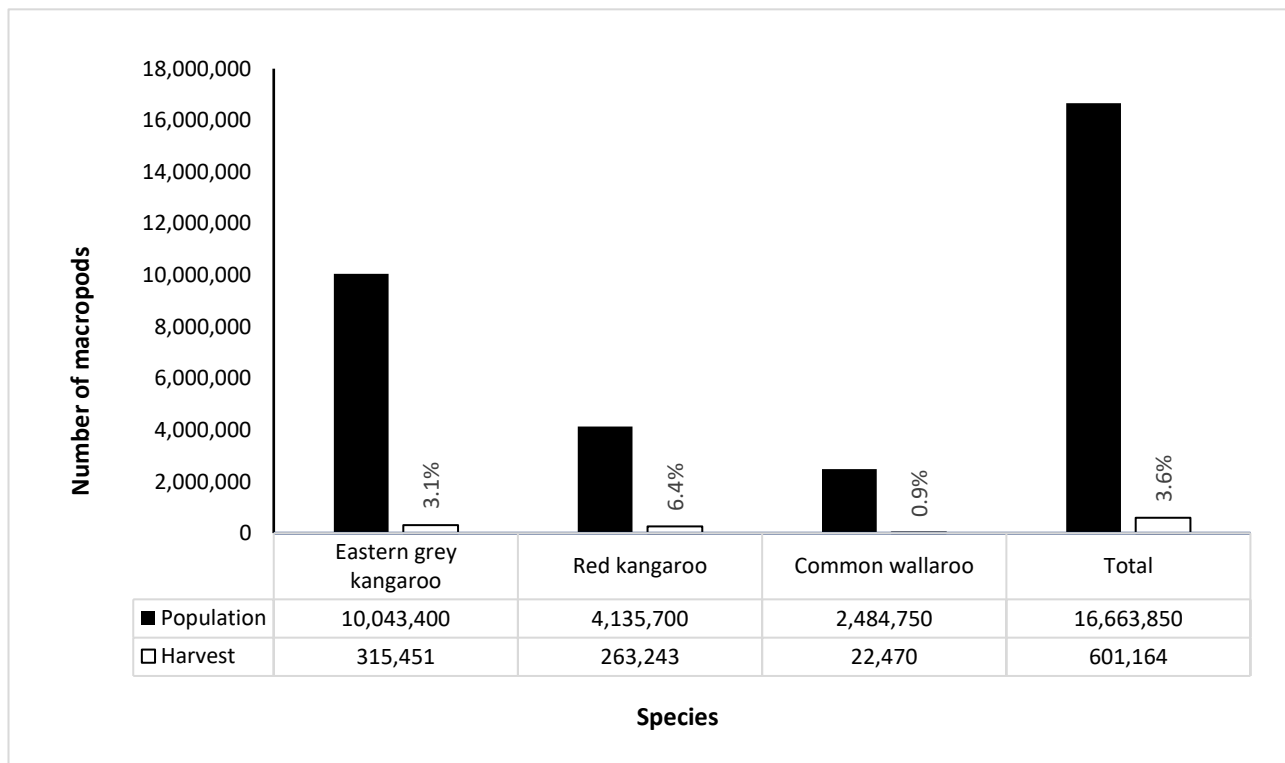


Figure 3—Total number of macropods harvested in 2021 compared to quotas



For all three commercially harvested species the percentage of the population harvested in 2021 was only 3.6% of the 2020 estimated population (Figure 4). For red kangaroos, 6.4% of the estimated population in the harvest area was harvested, while 3.1% of the estimated population of eastern grey kangaroos and 0.9% for common wallaroos was harvested.

Figure 4—Percentage of the 2020 estimated population harvested in 2021



Tables 2–5 contain detailed summaries of the commercial harvest in 2021. Quotas for each species in each zone were not exceeded in 2021. The highest percentage of quota used was for common wallaroos in the central zone at 62.2%. In all harvest zones the percentage of the population harvested for each species was below 7%.

Table 2—Total harvest in 2021

Species	Population estimate 2020	Quota 2021	Harvest take 2021	% quota used 2021	% population harvested 2021
Eastern grey kangaroo	10,043,400	1,087,450	315,451	29.0%	3.1%
Red kangaroo	4,135,700	673,050	263,243	39.1%	6.4%
Common wallaroo	2,484,750	220,650	22,470	10.2%	0.9%
Total	16,663,850	1,981,150	601,164	30.3%	3.6%

Note: population estimates are based on aerial surveys conducted in 2020, which were used to set the 2021 quota. Harvest figures are based on data available 10 March 2022.

Table 3—Harvest of red kangaroos in 2021

Zone	Population estimate 2020	Quota 2021	Harvest take 2021	% quota utilised 2021	% population harvested 2021
Central	3,490,050	608,450	227,594	37.4%	6.5%
Eastern	211,250	21,150	12,234	57.8%	5.8%
Western	434,400	43,450	23,415	53.9%	5.4%
Total	4,135,700	673,050	263,243	39.1%	6.4%

Note: population estimates are based on aerial surveys conducted in 2020, which were used to set the 2021 quota. Harvest figures are based on data available 10 March 2022.

Table 4—Harvest of eastern grey kangaroos in 2021

Zone	Population estimate 2020	Quota 2021	Harvest take 2021	% quota utilised 2021	% population harvested 2021
Central	3,834,900	468,000	206,009	44.0%	5.4%
Eastern	6,194,700	619,450	109,442	17.7%	1.8%
Western	13,800	0	0	NA	NA
Total	10,043,400	1,087,450	315,451	29.0%	3.1%

Note: population estimates are based on aerial surveys conducted in 2020, which were used to set the 2021 quota. Harvest figures are based on data available 10 March 2022.

Table 5—Harvest of common wallaroos in 2021

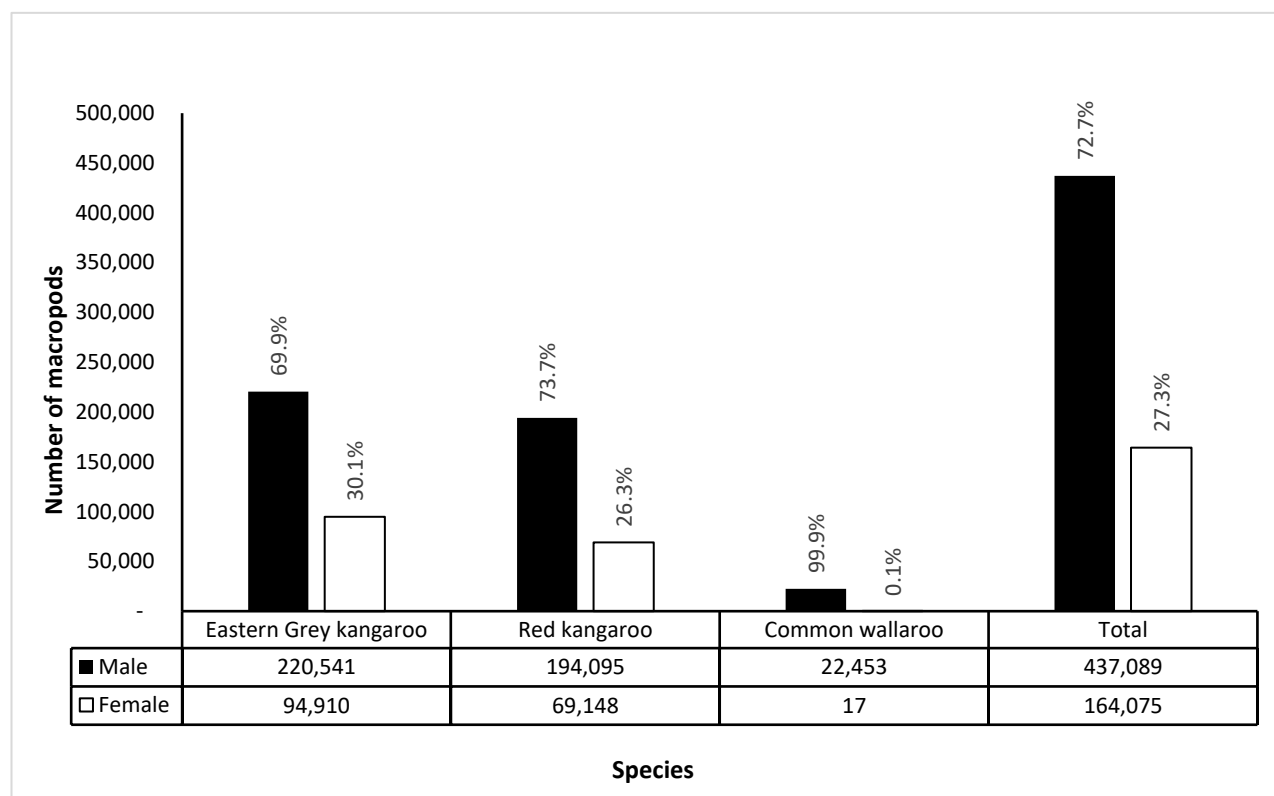
Zone	Population estimate 2020	Quota 2021	Harvest take 2021	% quota utilised 2021	% population harvested 2021
Central	471,300	19,300	12,009	62.2%	2.5%
Eastern	1,692,100	169,200	8,951	5.3%	0.5%
Western	321,350	32,150	1,510	4.7%	0.5%
Total	2,484,750	220,650	22,470	10.2%	0.9%

Note: population estimates are based on aerial surveys conducted in 2020, which were used to set the 2021 quota. Harvest figures are based on data available 10 March 2022.

3.1 Harvest sex ratio

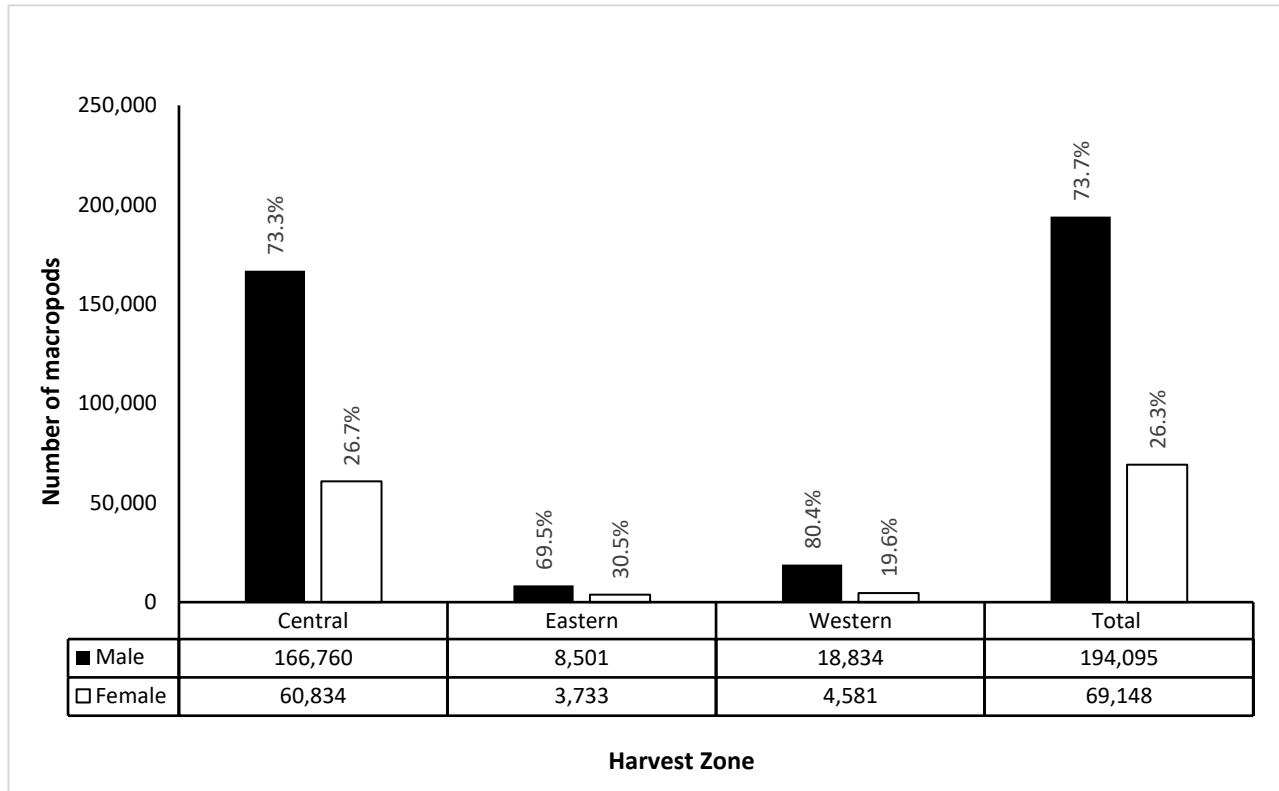
The commercial harvest is typically biased towards males due to their generally larger size and weight when compared to females. For 2021, the harvest for each species was biased towards males by 69% or greater (Figure 5). Females composed less than 28% of the overall harvest.

Figure 5—Sex ratio of harvested macropods in 2021 for all harvest zones combined



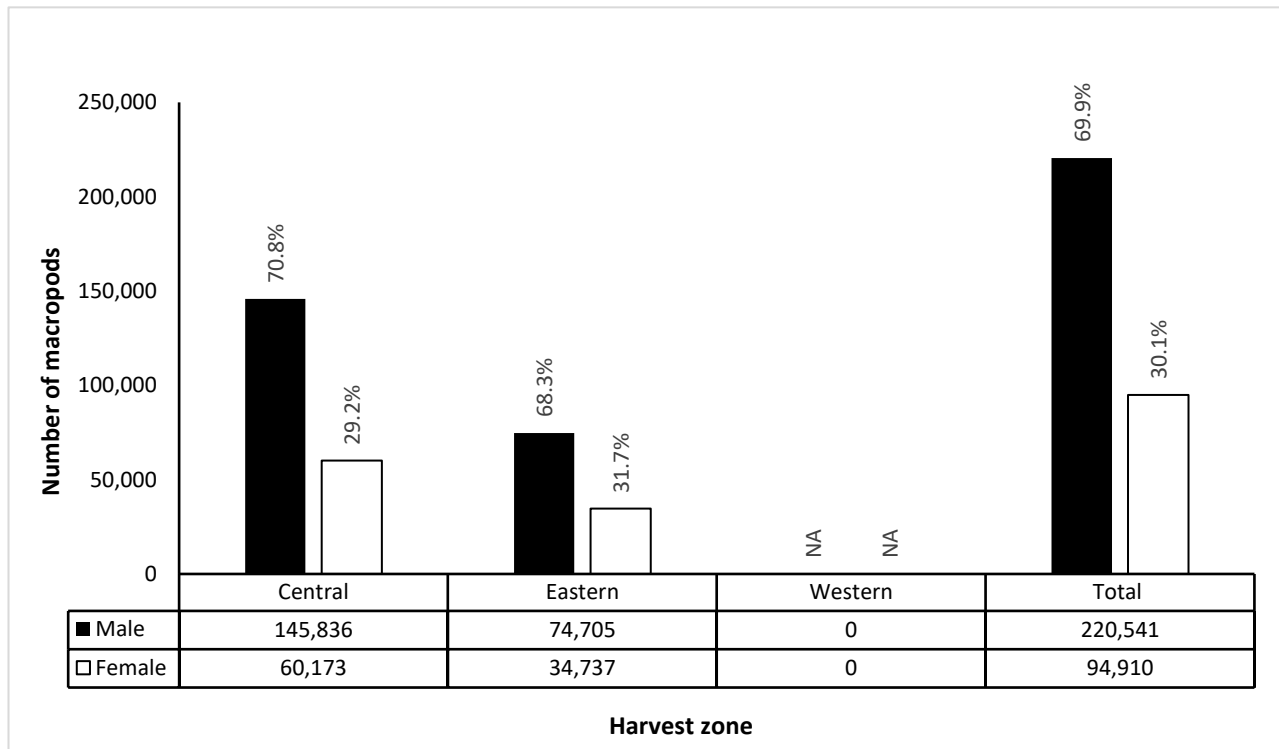
For red kangaroos, the highest percentage of females harvested was in the eastern zone at 30.5%. The overall take of females for this species was 26.3% of the harvest (Figure 6).

Figure 6—Sex ratio of harvested red kangaroos in 2021



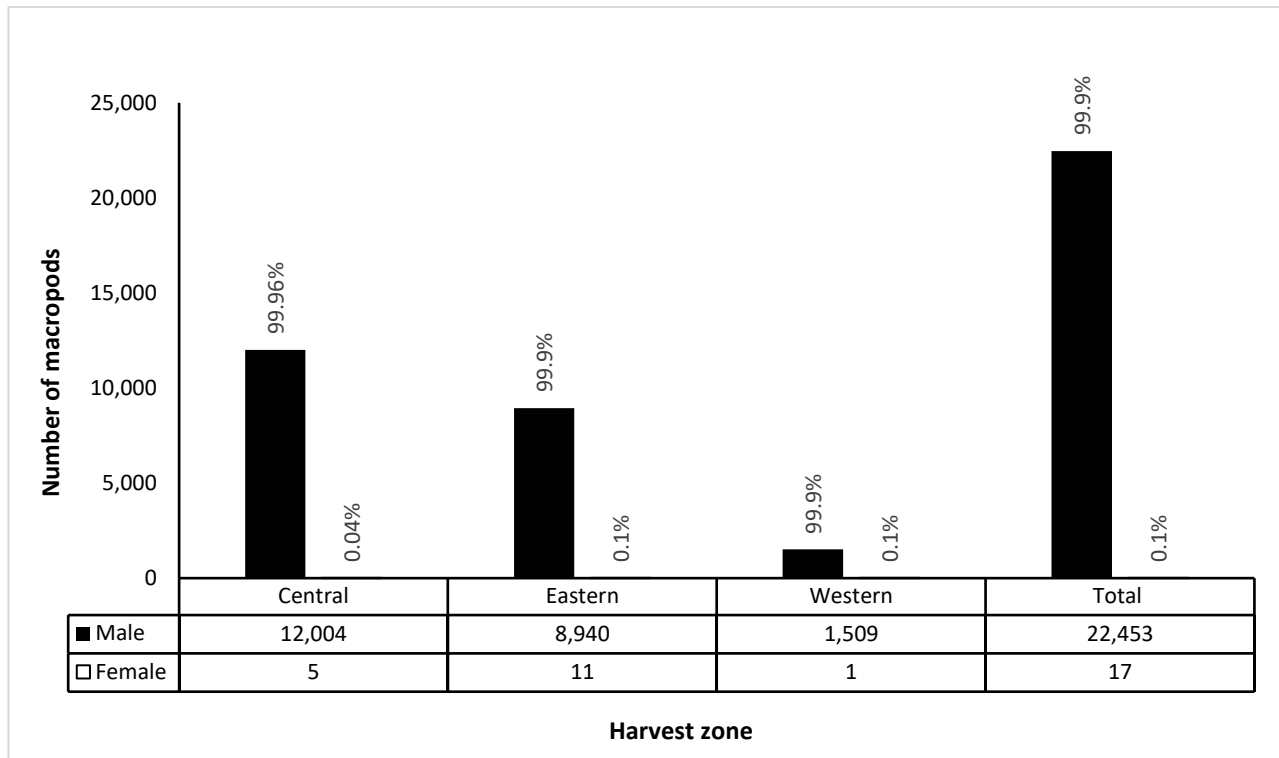
For eastern grey kangaroos the greatest percentage take of females was 31.7% in the eastern zone. The overall take of females for this species was 30.1% of the harvest (Figure 7).

Figure 7—Sex ratio of harvested eastern grey kangaroos in 2021



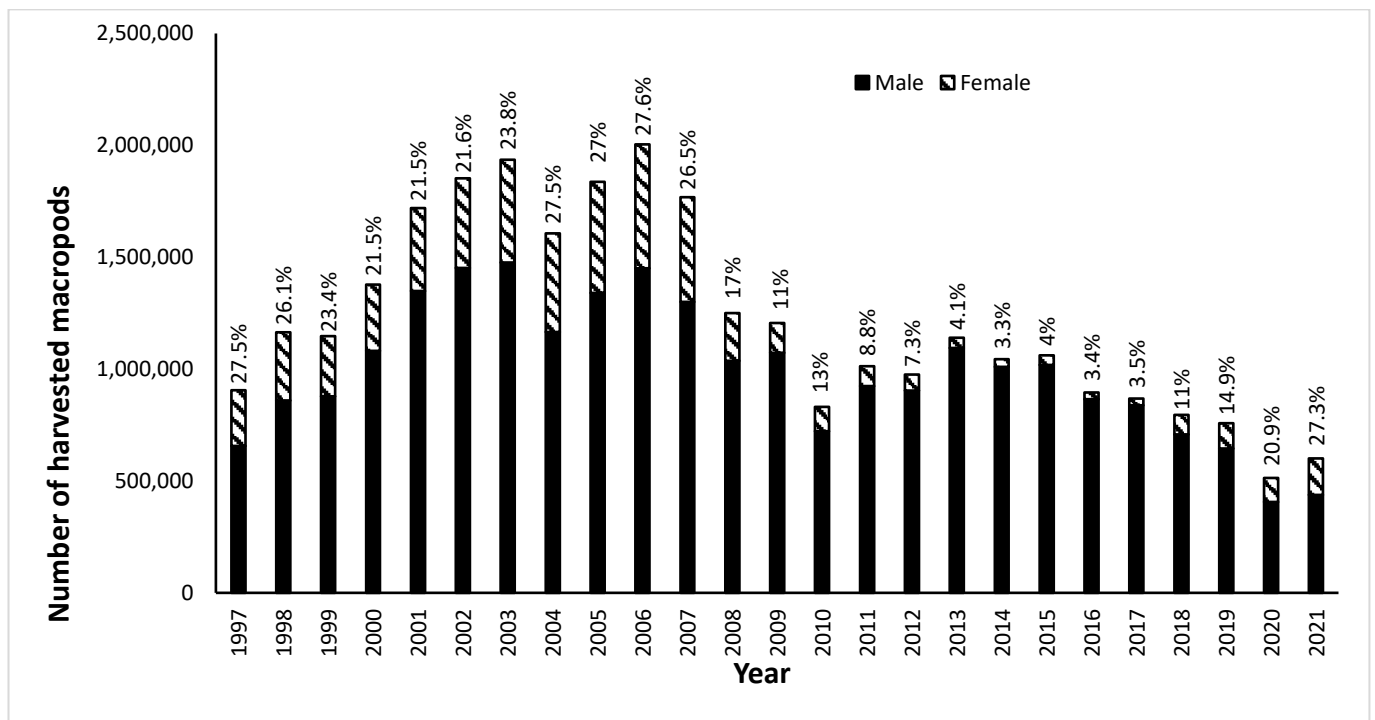
For common wallaroos the percentage of the harvest containing females was the lowest amongst the three commercially harvested species at an overall total of only 17 animals. The greatest percentage take of females for this species was 0.1% in the eastern and western zone (Figure 8).

Figure 8—Sex ratio of harvested common wallaroos in 2021



The proportion of the commercial harvest comprising females in 2021 was less than 28%. The percentage of females harvested in 2021 is higher than the previous 13 years (2008 – 2020) (Figure 9). This is a result of an industry decision in 2020 which has seen a reversal of the policy not to buy female macropods.

Figure 9—Queensland commercial macropod harvest sex ratio trend 1997 to 2021 (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. No macropods were commercially harvested for their skins only in 2021.

3.3 Average weight

The average dressed carcass weights per harvest zone and species are shown in figures 10 to 13. Carcass weights have fluctuated slightly in the past 12 years in each harvest zone with no significant increases or decreases having occurred in that time. 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.

Figure 10—Average dressed carcass weight of Queensland male macropod carcasses 2010–2021

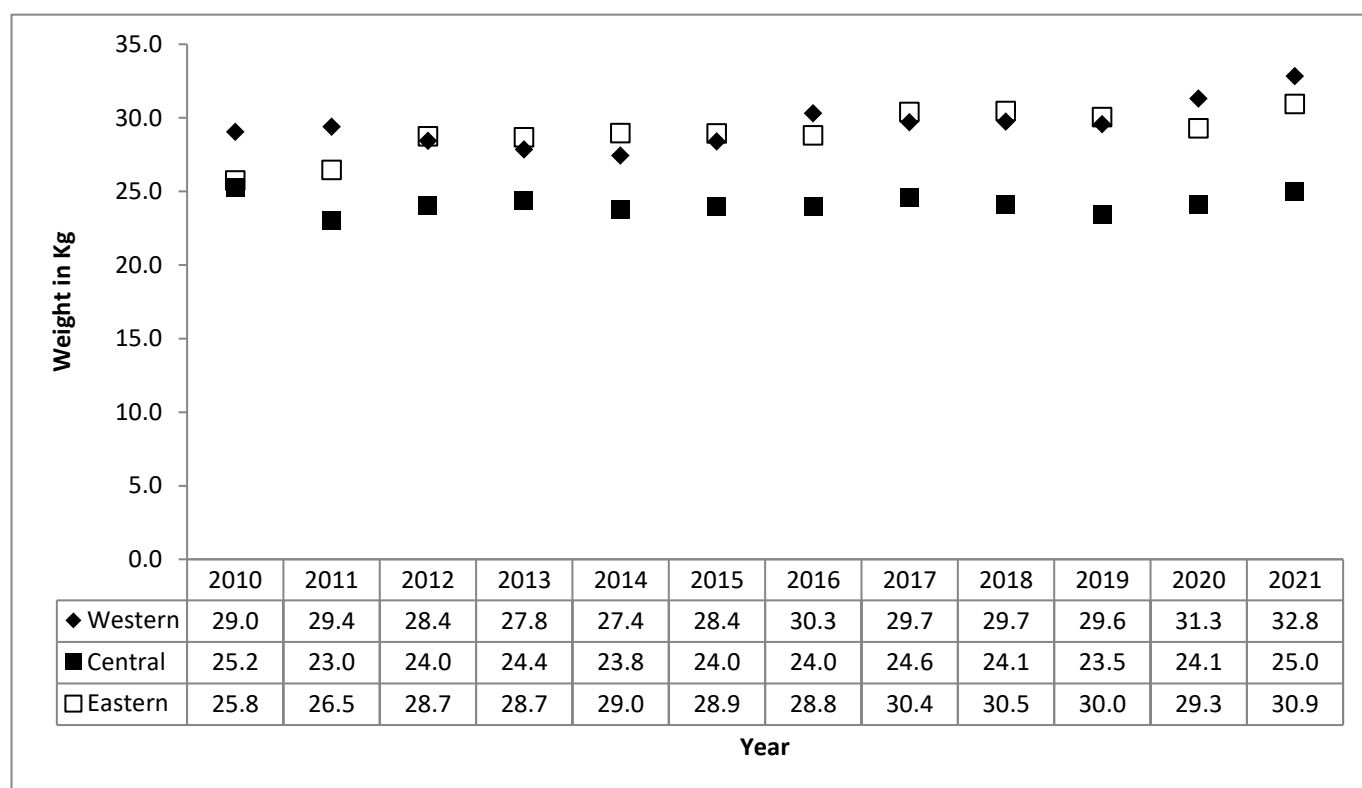


Figure 11—Average dressed carcass weight of Queensland female macropod carcasses 2010–2021

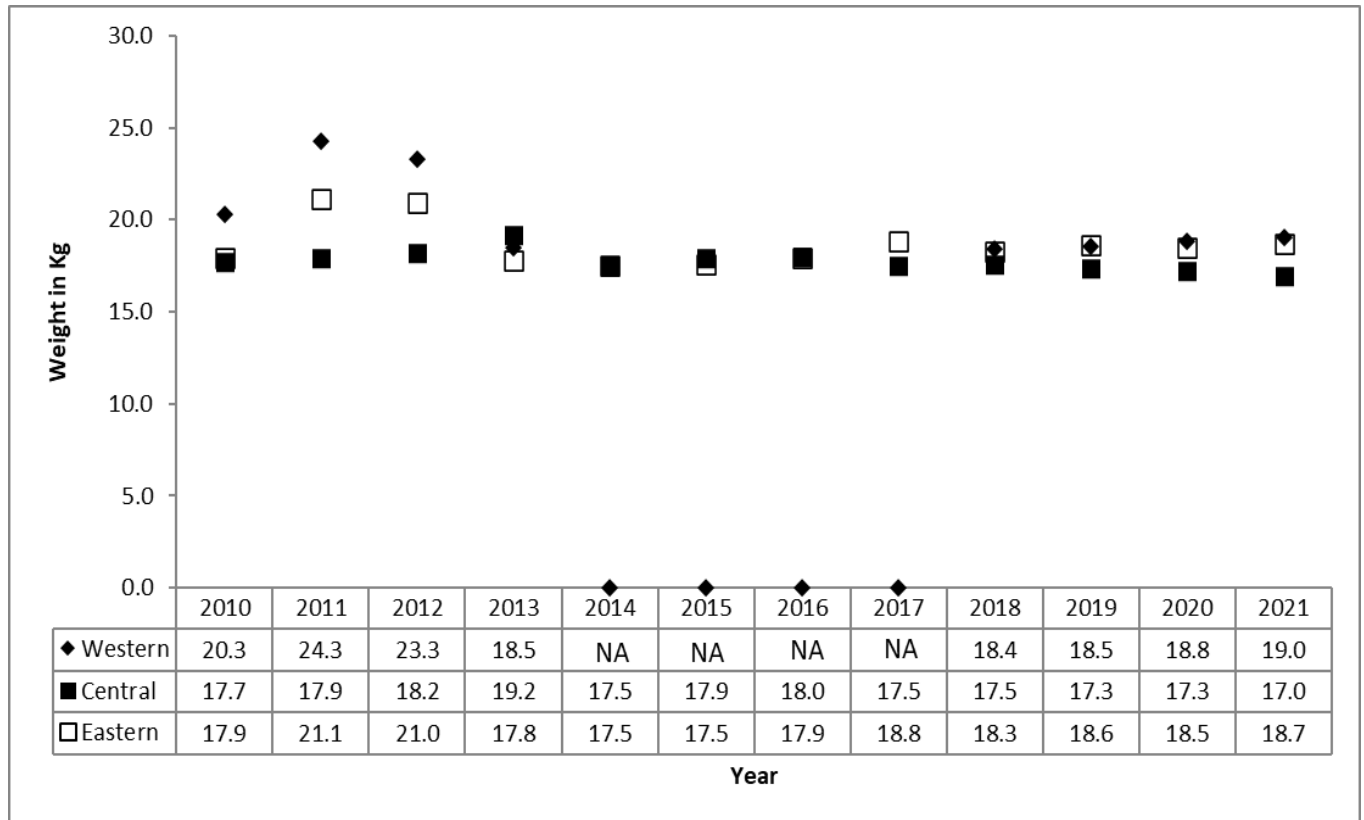


Figure 12—Average dressed carcass weight for male macropod species harvested in 2021. Note there is no quota for eastern grey kangaroos in the western zone.

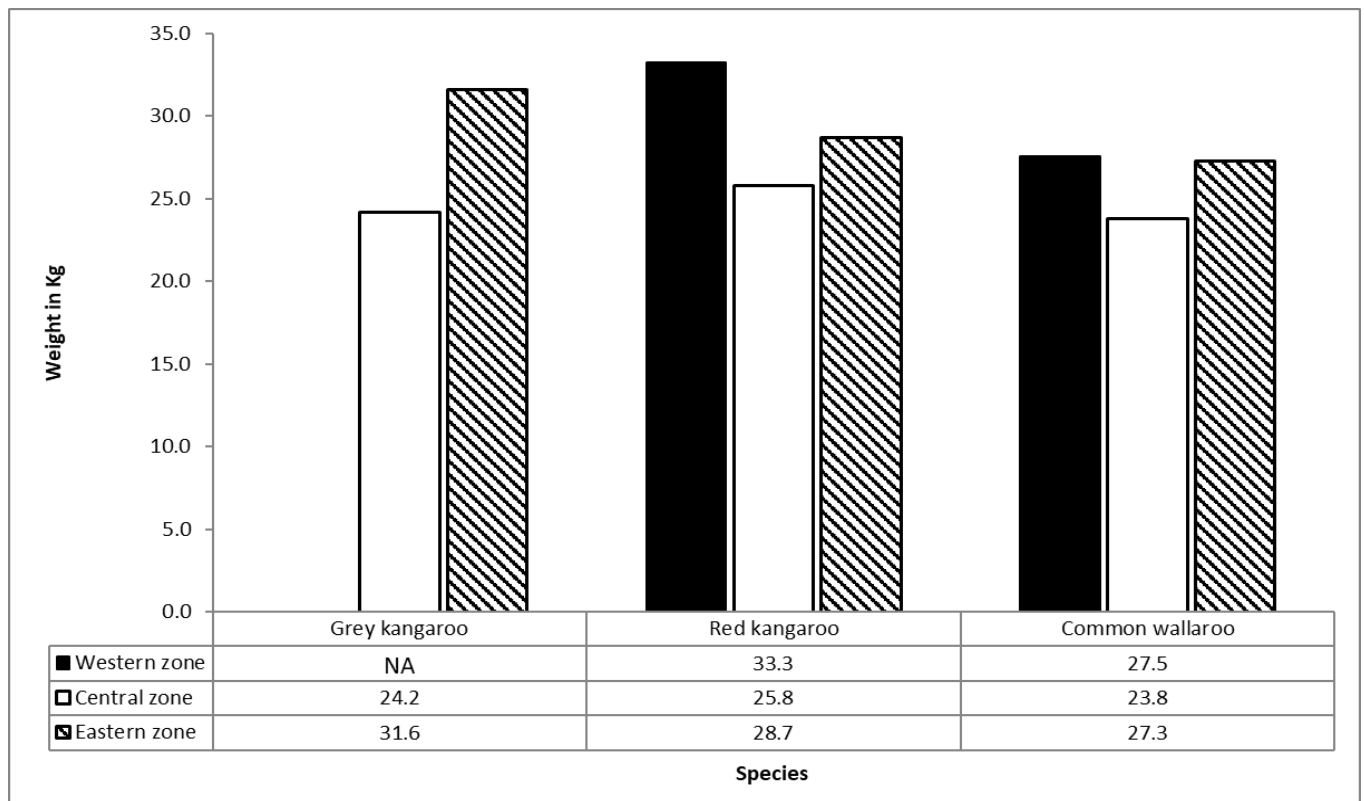
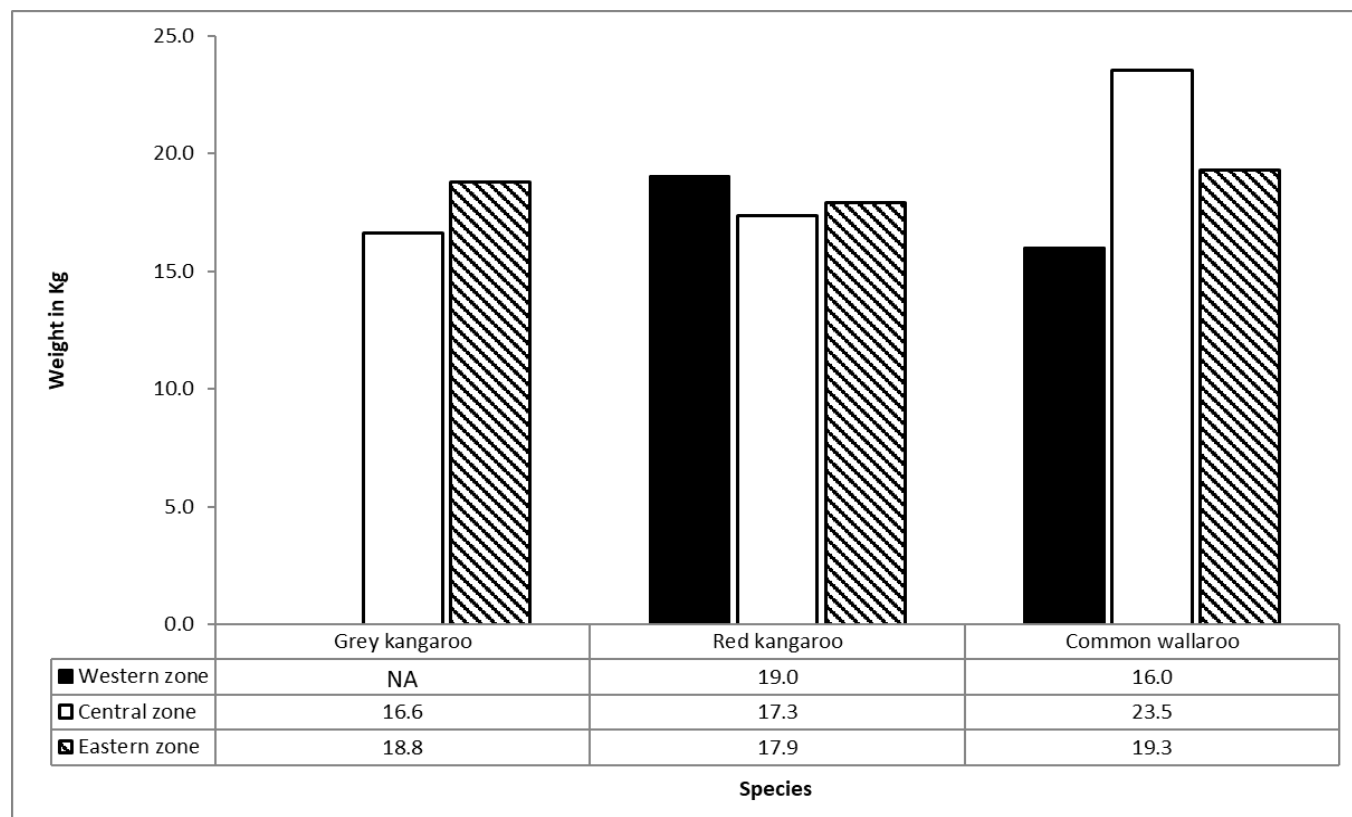


Figure 13—Average dressed carcass weight for female macropod species harvested in 2021. Note there is no quota for eastern greys in the western zone.



4. Special quotas

No special quotas were allowed for in 2021. 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

Damage mitigation permits (DMPs) are issued by the department where macropods may cause damage or loss of property or present 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 14). For comparative purposes, a summary of the macropods taken under DMPs for each species for 2008–2021 is outlined in Figure 15.

Figure 14—Macropod quota and allowable take for damage mitigation permits in 2021

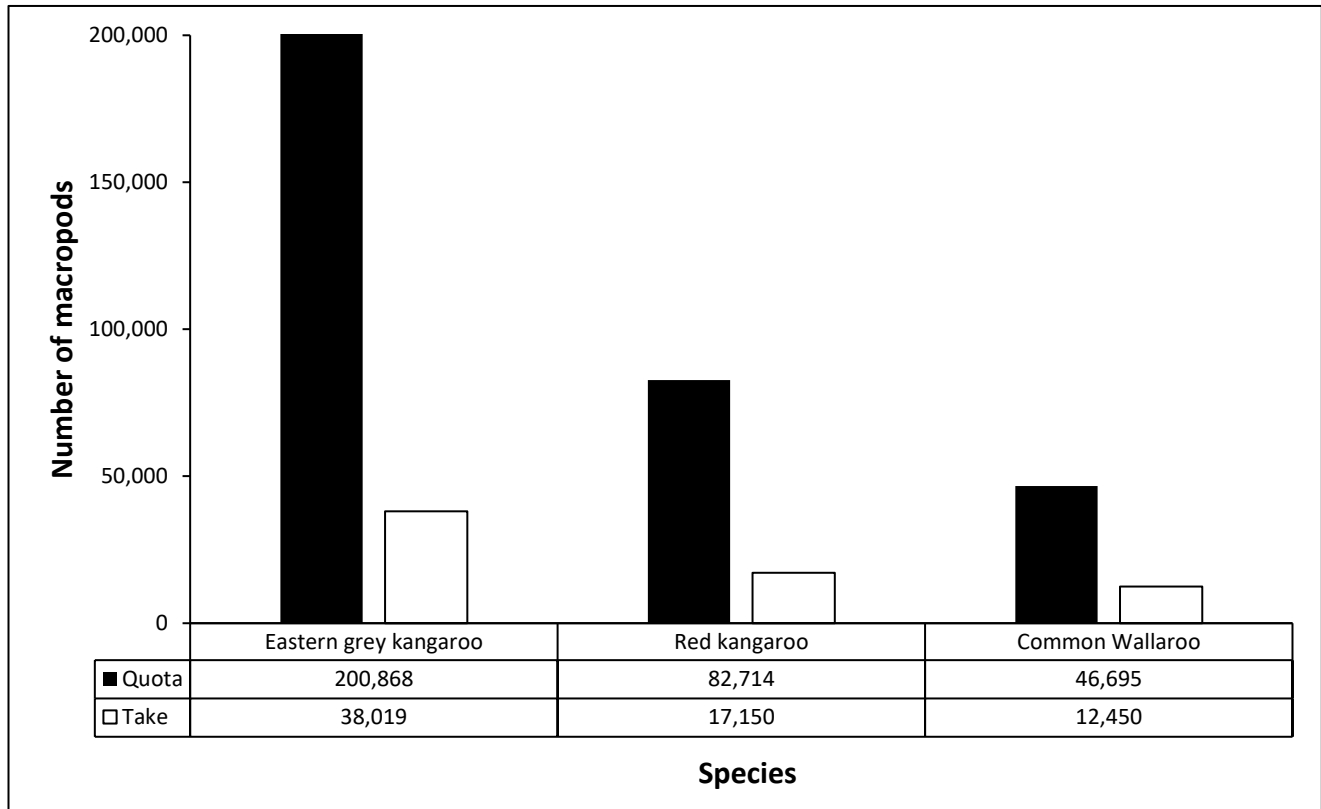
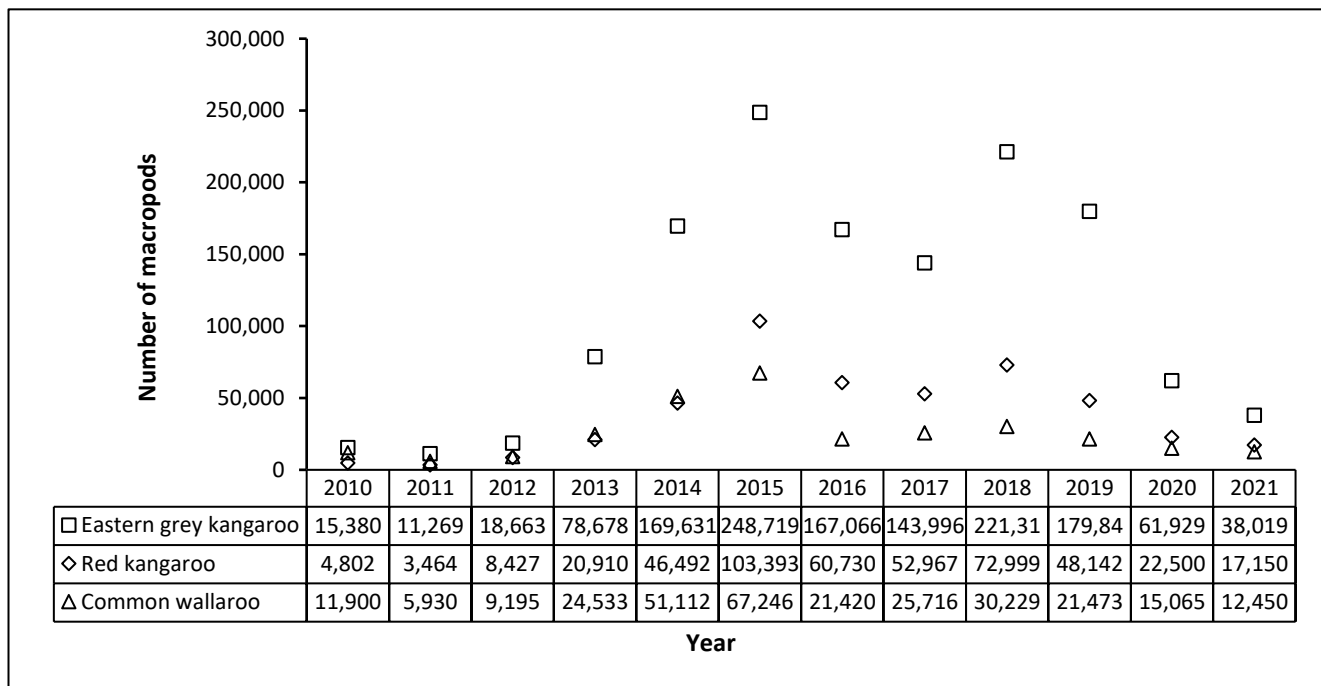


Figure 15—Macropods taken under damage mitigation permits 2010–2021



7. Disease outbreak mortality

No reports of disease outbreaks in macropods across Queensland were reported during 2021.

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 16) which would necessitate 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 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 16–19 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 1992–2021. 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 16—Estimated macropod populations in the Queensland commercial harvest zones 1992–2021

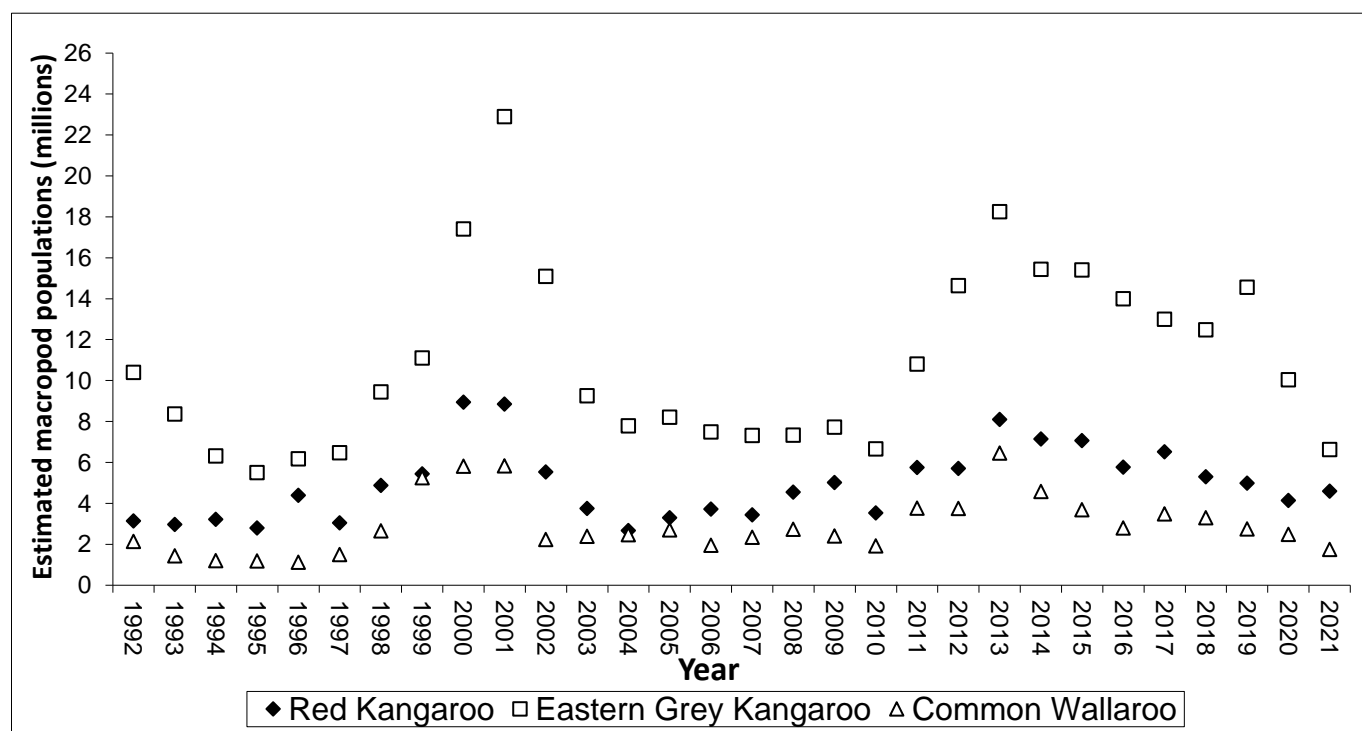


Figure 17—Long-term estimated populations (\pm SE), commercial harvest quotas and actual harvest of red kangaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year

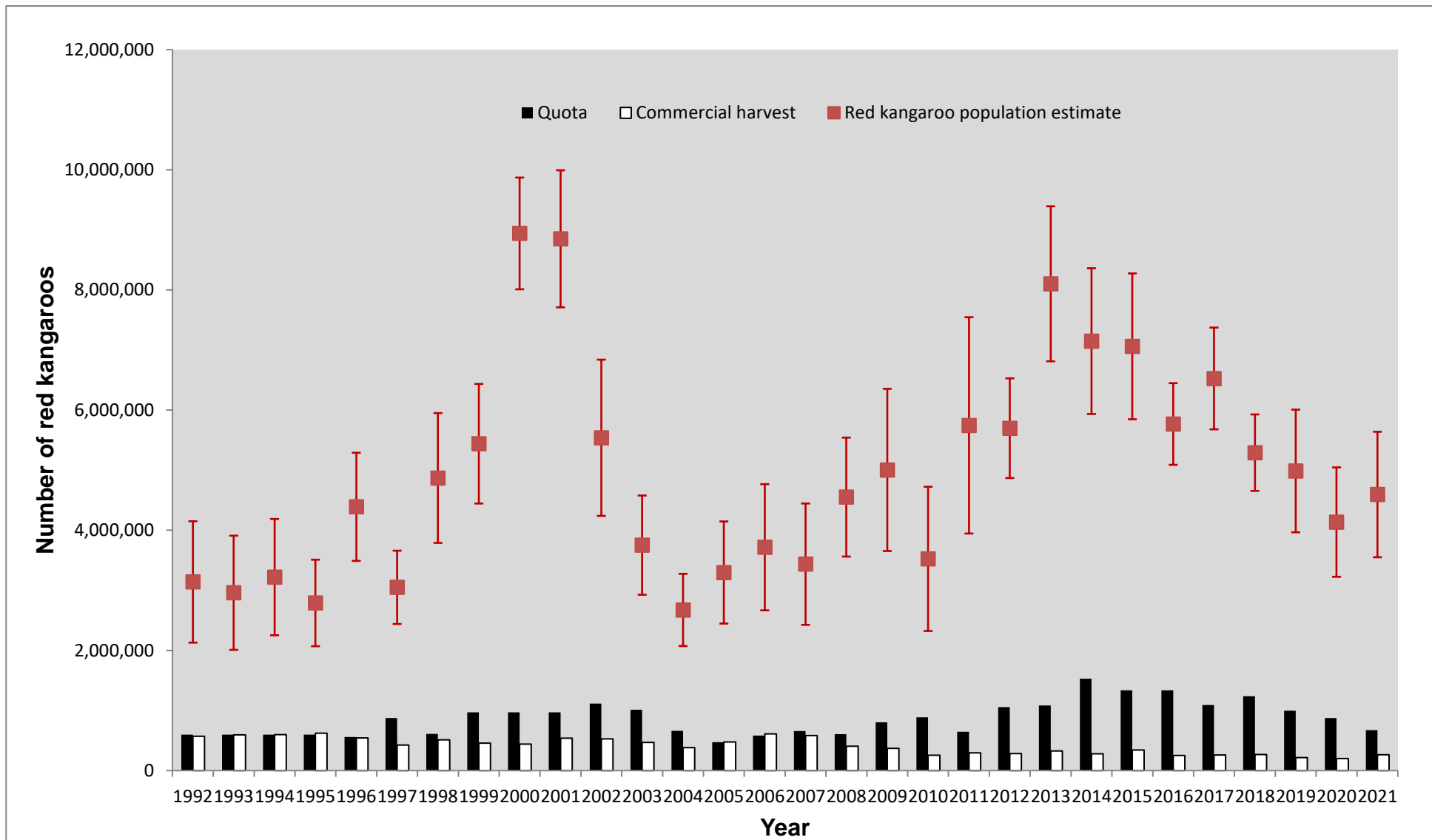


Figure 18—Long-term estimated populations (\pm SE), commercial harvest quotas and actual harvest of eastern grey kangaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year

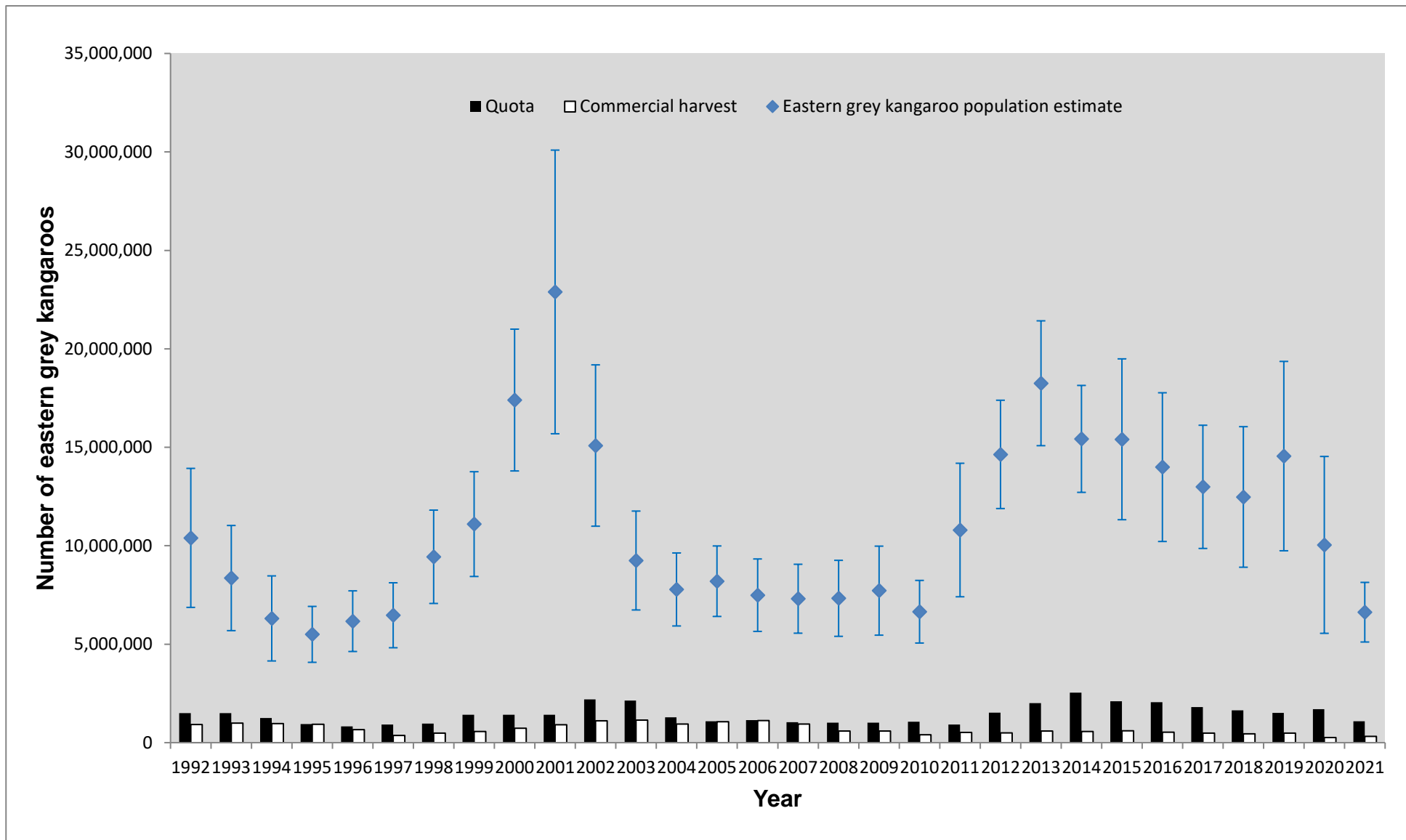
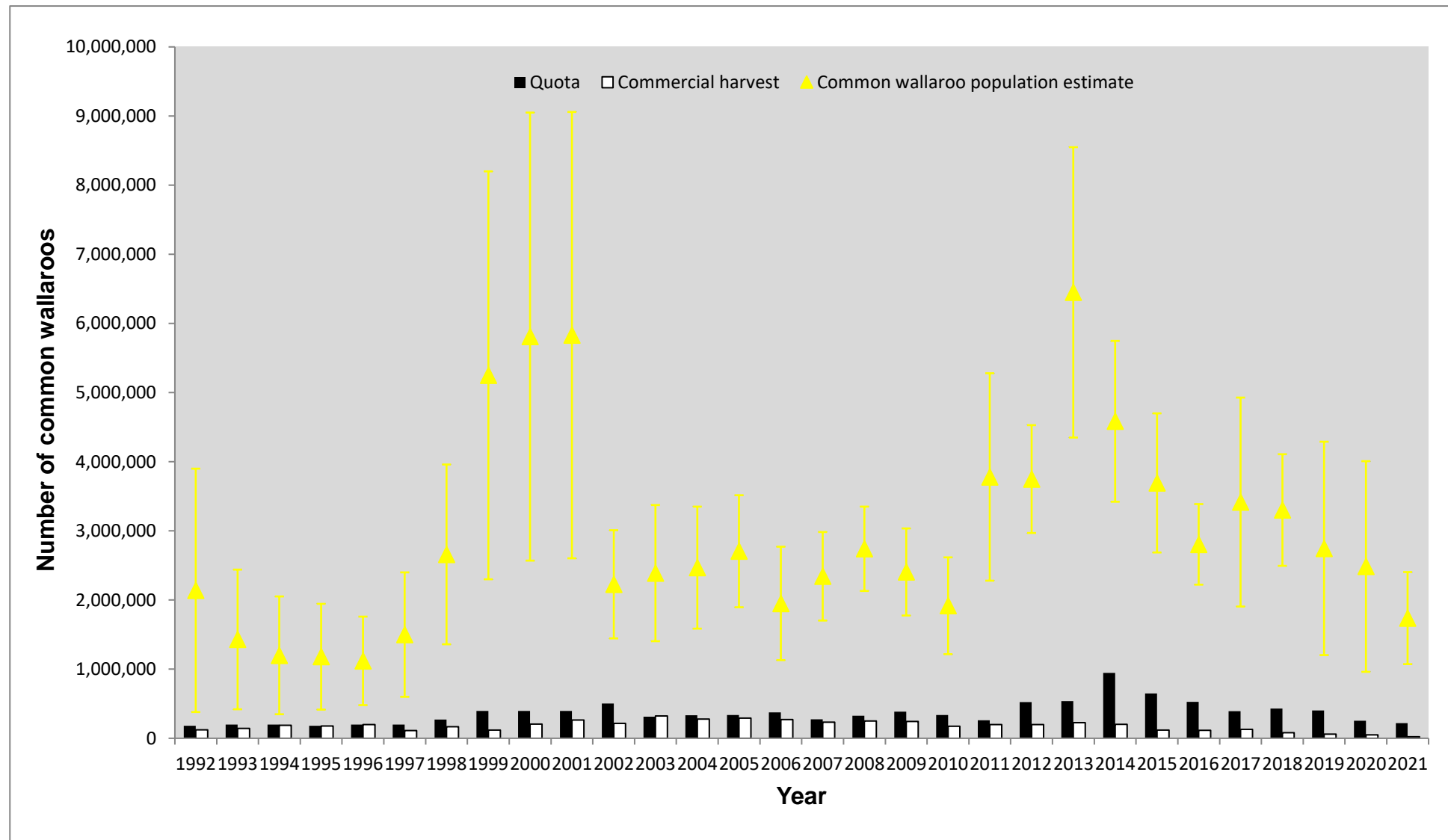


Figure 19—Long-term estimated populations (\pm SE), commercial harvest quotas and actual harvest of common wallaroos. Note: Commercial harvest quotas are based on survey estimates from the previous year



9. Compliance

During the 2021 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 three 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 2021 harvest period were:

- Harvesters hold the appropriate licence.
- Macropods are correctly tagged with a valid 2021 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 2020.
- 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 2021 harvest period, officers conducted 10 harvester inspections and 11 licensed dealer site inspections which included 5 licensed processor site 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 visually inspection target of 1% was not met, with only 0.7% of the total harvest visually inspected. This was due to the Covid-19 pandemic travel restrictions which prevented the compliance officers from travelling for approximately 8 months to conduct inspections. The detailed inspection target of 0.1% was also not met, with only 0.07% of the harvest inspected in detail (Table 6). Not all operating processor sites were inspected during the 2021 harvest period due to the Covid-19 pandemic travel restriction. 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	6,012 – (1%)	4,065 - (0.7% of harvest)
Detailed inspection of 0.1% of harvest	601 – (0.1%)	420 - (0.07% of harvest)

9.2 Compliance and enforcement measures

Breaches of legislation are subject to enforcement action such as warning notices, fines, licence cancellation or suspension 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 2021 harvest period, a total of 9 infringement notices and 190 warning notices were issued (Table 7). During the 2021 harvest period one licence was suspended and an application to hold a licence was refused. A successful court proceeding was conducted at the Charleville magistrates court on the 14 October 2021. The macropod harvester involved was convicted for seven charges relating to forgery, trespass, and noncompliance with harvesting regulations. The magistrate sentenced the harvester to 120 hours community service and fines totalling \$3,200.

Table 7—Detail of offences during 2021

Dealer	PIN	Warning
Fail to give return for each period/by prescribed time.		14
Harvester		
Fail to comply with condition of authority.	1	17
Fail to give return of operations for each month of the harvest period/by prescribed time.	3	153
Failure to have record complete, accurate, legible and in ink.	2	1
Fail to properly attach a tag immediately after macropod is dressed.	1	
Failure to keep record at prescribed place.		1
Failure to record relevant particular within prescribed time.		1
Failure to show authority or identification without reasonable excuse.		2
Keep/use unlawfully taken protected wildlife without lawful authority.	1	
Take protected animal without lawful authority	1	
Possess/Attach tag without lawful authority		1
Total	9	190

10. Climate

Queensland's temperatures in 2021 were above average across the state with many areas throughout the year recording significantly greater than average temperatures in some months. Rainfall across the state was also higher than average with many parts of the harvest zones receiving drought breaking rain. The Central East harvest zone and the southern half of the eastern harvest zones received significant rainfall and localised flooding in some areas throughout the year. The southern Darling Downs recorded the wettest year ever in 2021 whilst some surrounding districts recorded their wettest in 20 years.

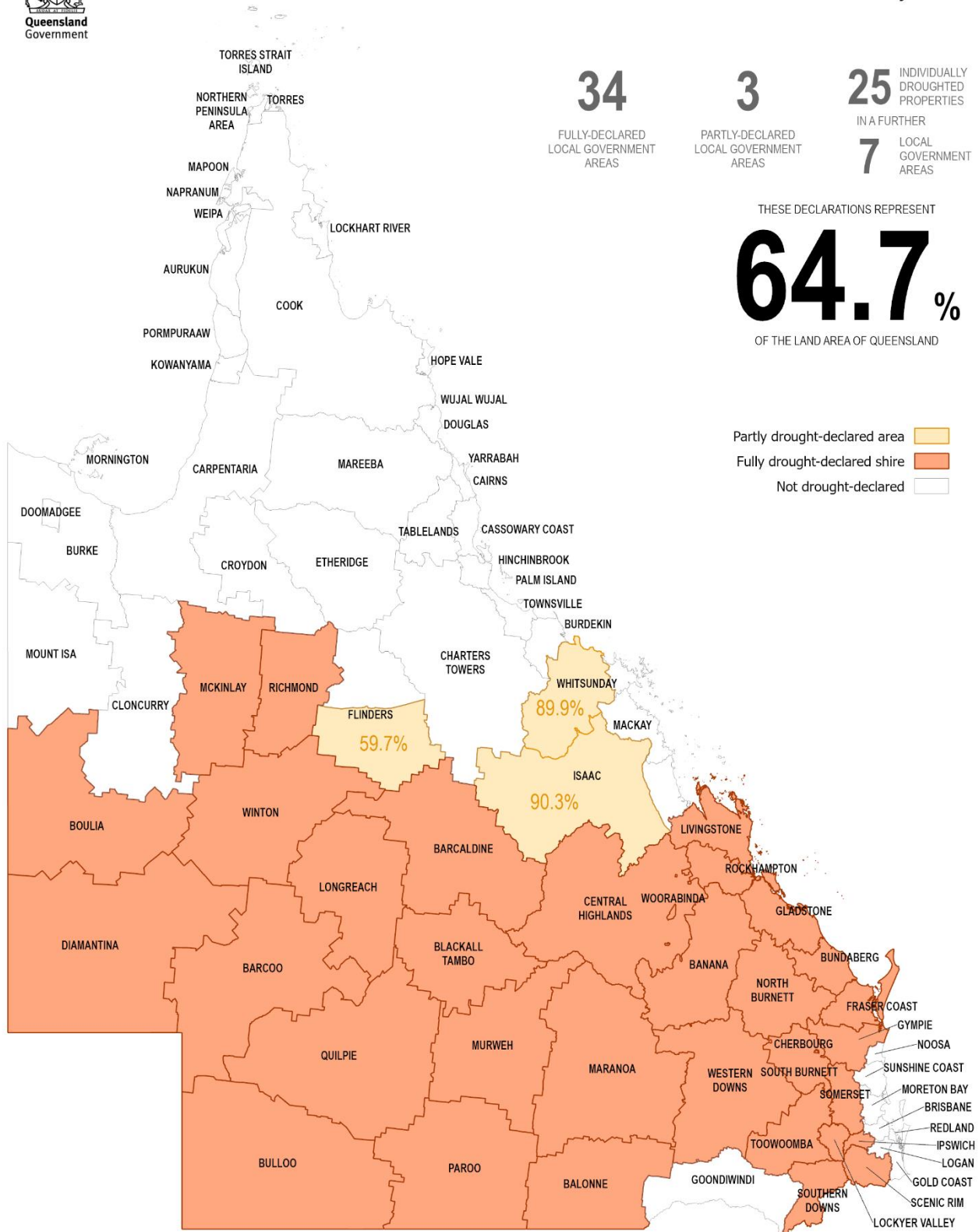
Despite the widespread rainfall to many areas the majority of the Queensland harvest zones remain drought declared as of 15 February 2022 (see Figure 20). Macropod population densities are unlikely to respond to the widespread rainfall over the next 12 months but may increase in the coming years if wetter than average conditions continue. The majority of the macropod harvest zones have now been drought declared for an extended period with the recovery of natural habitats and wildlife populations expected to take time (see Figure 21).

Figure 20— Queensland drought declarations at 15 February 2022



QUEENSLAND DROUGHT SITUATION

As reviewed on 15 February 2022

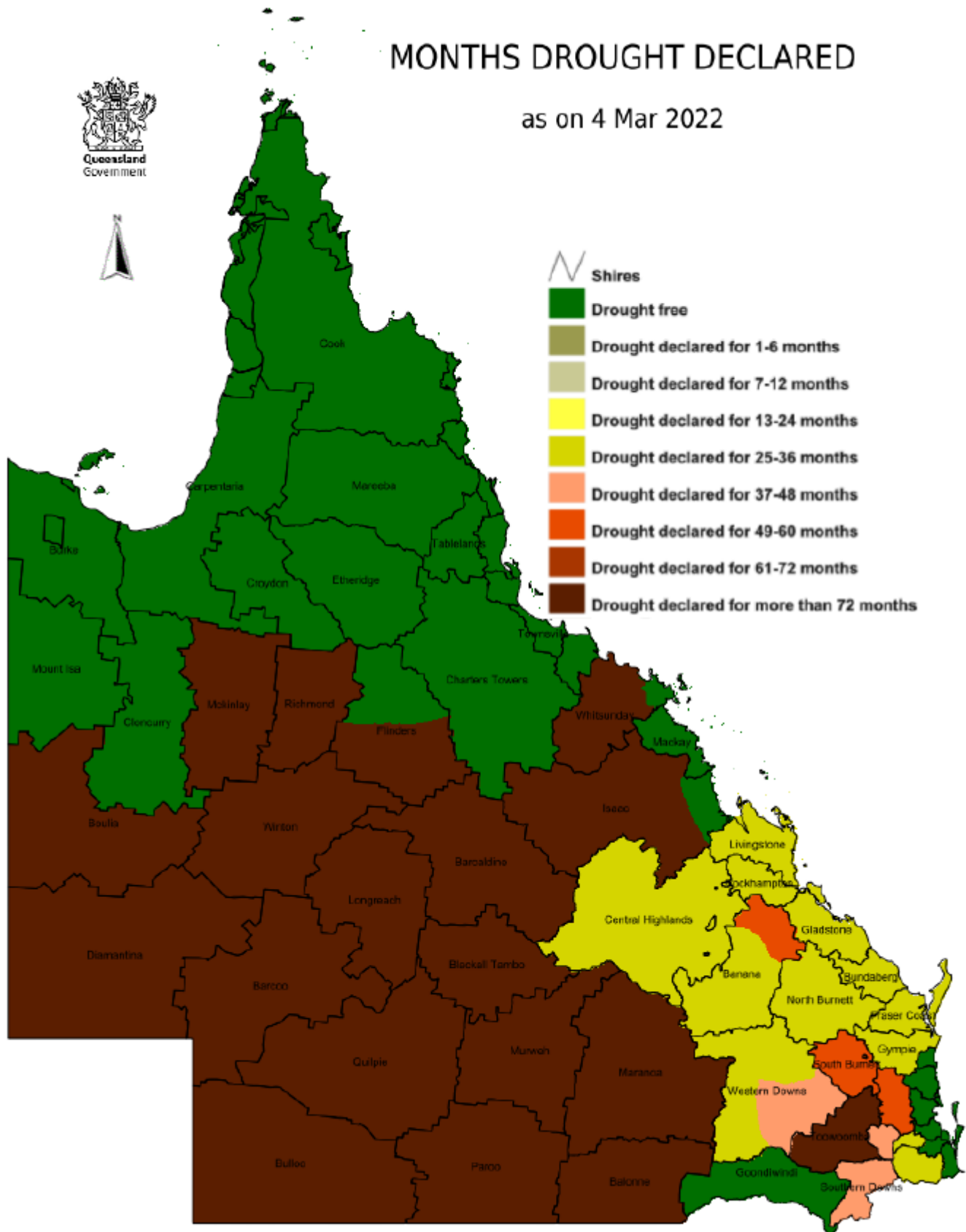


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Information contained in this publication is provided as general advice only. For application to specific circumstances, professional advice should be sought. The Department of Agriculture and Fisheries, Queensland, has taken all reasonable steps to ensure the information in this publication is accurate at the time of publication. Readers should ensure that they make appropriate inquiries to determine whether new information is available on the particular subject matter.

Figure 21— Queensland drought declarations dating back 72 months from January 2022.



11. Research and experiments

In October 2020, the department commenced a collaborative project with the Department of Agriculture and Fisheries. An aspect of the project will be looking into the effects of fencing on macropods. This project will be ongoing to May 2024.

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

12. Program improvements

The Department of Environment and Science (DES) is committed to working in genuine partnership with Queensland's First Nations people to achieve stronger outcomes for Country and people. To implement this commitment all management units across the department are implementing the Gurra Gurra framework. The Gurra Gurra Framework will help DES to reframe relationships with First Nations peoples by holding Country and people at the centre of all that we do, from policies and programs, to service delivery. The word 'Gurra Gurra' means 'everything' in the language of the Kooma people, whose Country is between Cunnamulla and St George in the Central South harvest region. Gurra Gurra reflects the need for our strategies, actions and relationships to be inclusive, integrated and complete. As part of the Gurra Gurra framework the Macropod Management Unit have begun raising awareness of the cultural significance of harvest macropods to First Nations people.

In 2021 the Macropod Management Unit commissioned artwork by Adrian Combarngo representing the three species of macropods that can be sustainably used in Queensland. Adrian is a descendant of King Jimmy of the Mandandanji Nation (the fishing net people), whose Country covers some 40,000km² in the Maranoa area centred around the town of Surat in Queensland. A self-taught artist, Adrian's paintings speak of the Dreamtime and how his ancestors lived, based on stories he has collected during his journey of self-discovery. When not painting Adrian works for Warroo Game Meats in Surat processing kangaroo meat for human consumption. The artwork will form the basis of many areas of cultural awareness relating to the sustainable and wise use of harvest macropods in Queensland.

New harvest tags were introduced during the 2021 harvest period. The tags are manufactured in Australia from Tyvek and meet all the requirements of being tamper proof, single use and individually identified. The tags now feature a QR code that corresponds to the unique identification number and are colour coded for each species with a section of artwork created by Adrian Combarngo. Whilst not biodegradable the Tyvek tags are only 10% of the weight of the previous plastic tags used by the department and can be recycled. Due to the significant reduction in size as well as weight the tags can now be posted to harvesters in paper envelopes instead of plastic satchels. Each paper envelope used to deliver tags features artwork by Adrian Combarngo and promotes the importance of harvest macropods to First Nations people. The overall reduction in single use plastic is consistent with a whole of Queensland government policy to move towards a more sustainable society.

Due to travel restrictions and limitations on group meetings due to Covid 19 the Macropod Management Unit has changed the way it engages with the many stakeholders involved with macropod management. The annual stakeholder forum which used to be in person was conducted via an online video platform in 2021. The forum was spread over three meetings so that industry representatives, NGOs and government departments could share information with the Macropod Unit separately. Feedback from participants about the new arrangements were very positive. All licence holders in 2021 were contacted directly via email or letter sharing updates to the program and quotas for the coming year as well as a link to the latest Quota Submission for the program.

The National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes 2020 was implemented throughout 2021. The new code was received well by the industry and forms the basis for much of the compliance activities undertaken by the Macropod Management Unit. The code sets the standard of humane conduct required of licence holders shooting macropods. The review of the code— led by AgriFutures through an appointed consultant and project reference group— started in 2018 and continued throughout 2019 and 2020. The reference group had representatives from Australian and state government authorities responsible for kangaroo management, the kangaroo and pastoral industries, the Australian Veterinary Association and the RSPCA. The Queensland Macropod Management Unit represented states with a commercial harvest on the reference group. Public consultation of the revised commercial code ran for 28 days beginning on the 25th of November 2019.

During 2020, the department provided the ability for harvester and dealer permit holders to enter and submit their record returns online in the Online Services system. Throughout 2021, the online return function was utilised by approximately 20% of permit holders, while the remaining 80% were still using the paper-based record book. The Macropod Management Unit continue to encourage licence holders to utilise macropods Online the departments macropod harvesting and management 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.

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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 2021
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.
	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 2021
	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.	Not 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.	Not 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 2021
	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 The Macropod Unit were given an extension to June 2022 for this 2021 Annual Report
		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.
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 2021
<p>Aim 7. Promote community awareness and participation.</p>	<p>Action 7.1. Relevant public documents will be made available on the department's website.</p>	<p>7.1.1. Throughout the life of this plan, the department's website contains the following information as a minimum standard:</p> <ul style="list-style-type: none"> – 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. 	<p>Achieved</p>
	<p>Action 7.2. Publicly available information will be provided to interested parties on request.</p>	<p>7.2.1. Publicly available macropod management information is distributed to interested parties as soon as practicable after such a request.</p>	<p>Achieved</p>
	<p>Action 7.3. Where appropriate, relevant macropod management program staff will participate in media interviews and prepare media releases.</p>	<p>7.3.1. Departmental staff participate in interviews with the media where appropriate.</p>	<p>Achieved</p>
		<p>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.</p>	<p>Achieved</p>
	<p>Action 7.4. Relevant information regarding licensing arrangements will be developed as required and made available to all licensees.</p>	<p>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.</p>	<p>Achieved</p>