



2022 Annual report on the commercial harvest of kangaroos in Western Australia

This report is provided to the Australian Government as a requirement of the *Management Plan for the Commercial Harvest of Kangaroos in Western Australia 2019–2023* under Aim 6, Action 16, Performance Indicator 25.

April 2023



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Conservation and Attractions**

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April 2023

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1 Harvest statistics

The statistics for Western Australia's red and western grey commercial kangaroo harvest are presented below in Table 1 and Table 2, and Figure 1 and Figure 2. In 2022, the commercial harvest was 9.5% of the allowable quota for red kangaroos and 37.2% of the allowable quota for western grey kangaroos.

1.1 Red kangaroos

Table 1. Commercial harvest figures for red kangaroos for the 2022 calendar year.

Population Monitoring Zone	Number harvested	Sex ratio (% male)	Average male carcass weight (kg)	Average female carcass weight (kg)
Central	3,616	72.7	25.1	15.6
Northern	6,062	66.3	26.1	15.3
South East	9,982	84.0	25.1	14.9
Totals (WA)	19,660	76.5	25.4	15.2
State quota	207,340			
Proportion state quota harvested	9.5%			

1.2 Western grey kangaroos

Table 2. Commercial harvest figures for western grey kangaroos for the 2022 calendar year.

Population Monitoring Zone	Number harvested	Sex ratio (% male)	Average male carcass weight (kg)	Average female carcass weight (kg)
Central	5,900	71.5	26.5	16.6
South East	1,433	77.7	30.8	16.6
South West	55,221	63.3	29.8	17.8
Totals (WA)	62,554	64.4	29.5	17.7
State quota	168,070			
Proportion state quota harvested	37.2%			

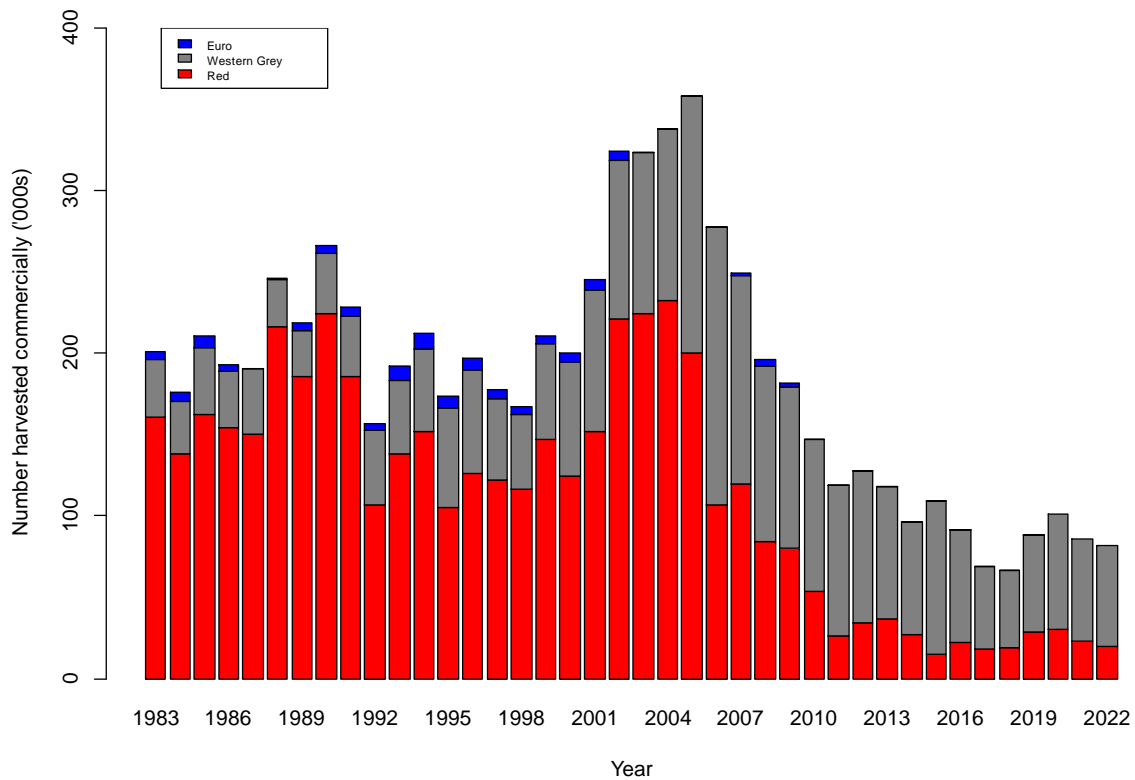


Figure 1: Total harvest in the state for red and western grey kangaroos.

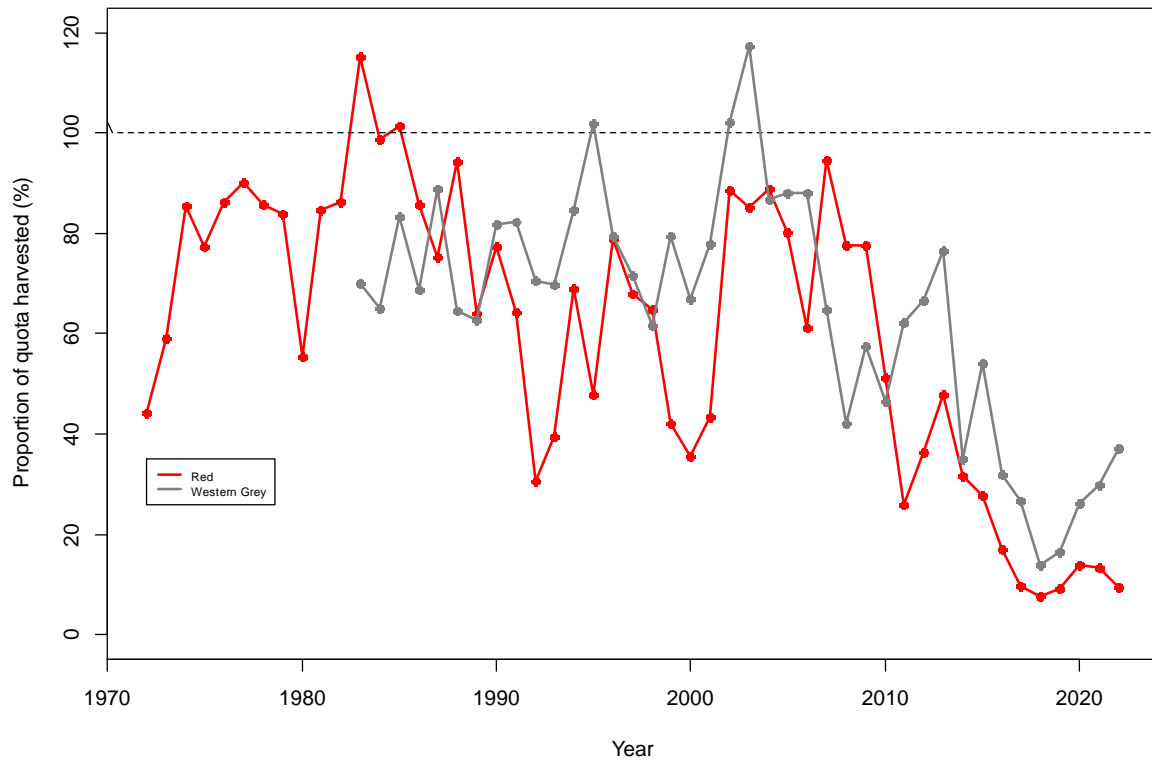


Figure 2. The proportion of quota harvested in the state for red and western grey kangaroos.

2 Industry compliance

Table 3. Summary of compliance monitoring of the commercial kangaroo industry in Western Australia for the 2022 calendar year.

Category	Commercial Activity			
	Regulation 23: Licence to Take Kangaroos for Sale	Regulation 37: Licence to Process	Regulation 23 or Regulation 38: Active Chiller Units*	Regulation 38: Licence to Deal in Skins
Licences current in 2022	396	29	68	1
Licensees/ premises inspected	9	23	17	1
Alleged offences	29	10	1	0
Type of alleged offence	BCR R84 Contravene condition of licence BCA S149(1)(C) Unlawful take of fauna BCR R101(2) Access to land without authority from landowner/ occupier BCR R100(4) Failing to affix identifier.	BCR R84 Contravene condition of licence BCR R85(2) Failure to produce information or record BCR R100(5) Failure to reject fauna that does not have identifier fixed.	BCR R84 Contravene condition of licence	0
Letters of warning issued	0	0	0	0
Caution notices issued	28 + 1 infringement	9 + 1 infringement	0	0
Prosecutions initiated	0	0	0	0
Convictions	0	0	0	0
Dismissals	0	0	0	0
Prosecutions pending	0	0	0	0

* Active chiller units are those chillers identified on shooter returns where there is at least one shooting day of effort assigned to that chiller during the year.

3 Unusual circumstances

3.1 Rainfall and drought

The following is an excerpt of relevant information taken from the annual climate summary for Western Australia published by the Bureau of Meteorology (product code IDCKGC51R0; accessed 22 March 2023). The full annual climate summary is available from <http://www.bom.gov.au/climate/current/annual/wa/summary.shtml>

Western Australia's above average annual rainfall in 2022 was largely due to the second-wettest spring on record. The state-wide annual maximum and minimum temperatures were above average, but it was the coolest daytime temperatures since 2011. Early in January, an extreme to severe heatwave was observed in the Pilbara with temperatures climbing over 50 degrees at multiple sites.

Above average rainfall in the north and eastern South West Land Division

- Annual rainfall was 22% above the 1961–1990 average, the wettest year since 2017 for Western Australia.
- Rainfall was above average for much of the northern WA and eastern parts of the South West Land Division; it was the seventh-wettest year on record for the Kimberley District.
- Ex-Tropical Cyclone Charlotte produced daily rainfall of 100–200 mm in the Gascoyne District at the end of March, several sites had their annual daily rainfall records on the 30th.
- Daily rainfall of 50–120 mm was recorded near the Gascoyne coast at the start of April; Carnavon recorded 118.6 mm on the 2nd, its highest daily rainfall in April, and its third-highest annual daily rainfall on record, behind 207.8 mm on 17 December 2010, and 137.2 mm on 5 February 2021.
- A slow-moving trough produced a number of annual daily rainfall records in the South East Coastal District on 13 and 14 April.
- A cloudband and cold front produced daily rainfall of 25–70mm along the west Gascoyne and Central West districts on 16 August, including several annual daily rainfall records.
- Large parts of the Kimberley and the adjacent Northern Interior districts observed their highest spring rainfall on record, and in the top 10% of historical records for most of the northern half and south-east of the state, as well as along the south coast. It was the second-wettest spring on record for WA.

Extreme heatwave with record breaking temperatures in the Pilbara

- The annual mean maximum temperature was 0.61 °C above the 1961–1990 average for Western Australia, although the year 2022 was the coolest since 2011.
- The annual mean minimum temperature was 0.38 °C above the 1961–1990 average for Western Australia.

- An extreme to severe heatwave was observed in the Pilbara and central Western Australia between 12 and 14 January, when maximum temperatures reached high 40s to over 50 °C including a handful of records.
- Onslow Airport recorded 50.7 °C on 13 January, which equalled the all-time highest temperature in Australia; both Roebourne Aero and Mardie recorded 50.5 °C on the same day, ranking as the equal third-highest temperature in the country.
- Geraldton Airport in the Central West District recorded its all-time longest run (6 consecutive days) with maximum temperatures over 43 °C in 113 years of record in late January.
- On the last day of May, wet and cloudy conditions over the northwest WA resulted in daytime temperatures in the low 10s, the annual coldest day on record for a number of sites in the Pilbara.

Western Australian rainfall deciles 1 January to 31 December 2022

Australian Gridded Climate Data

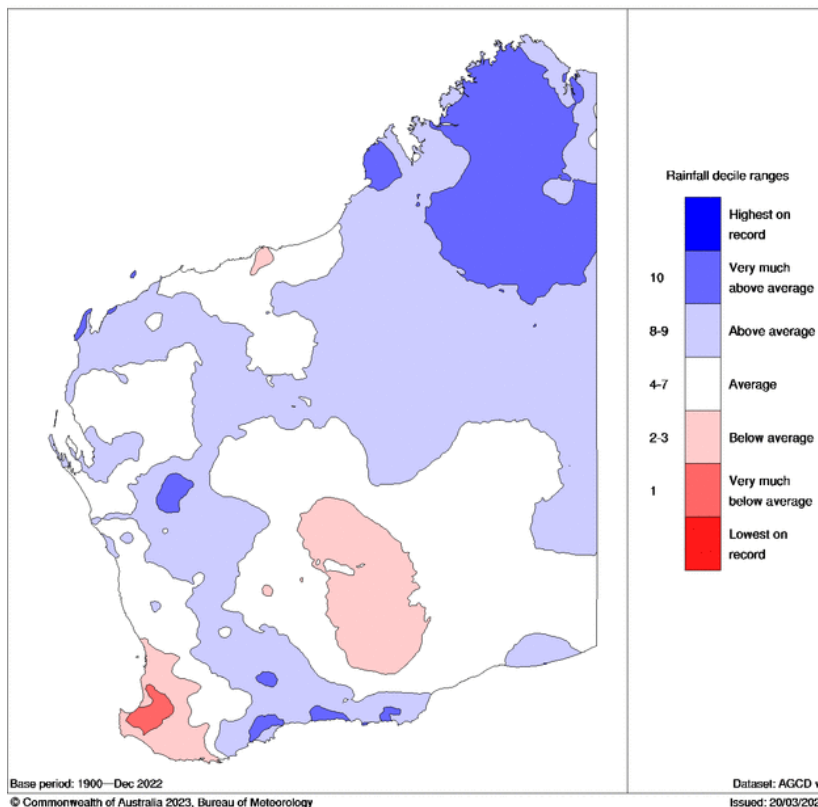


Figure 3. Rainfall deciles for Western Australia for the 2022 calendar year.

Western Australian total rainfall (mm) 1 January to 31 December 2022

Australian Gridded Climate Data

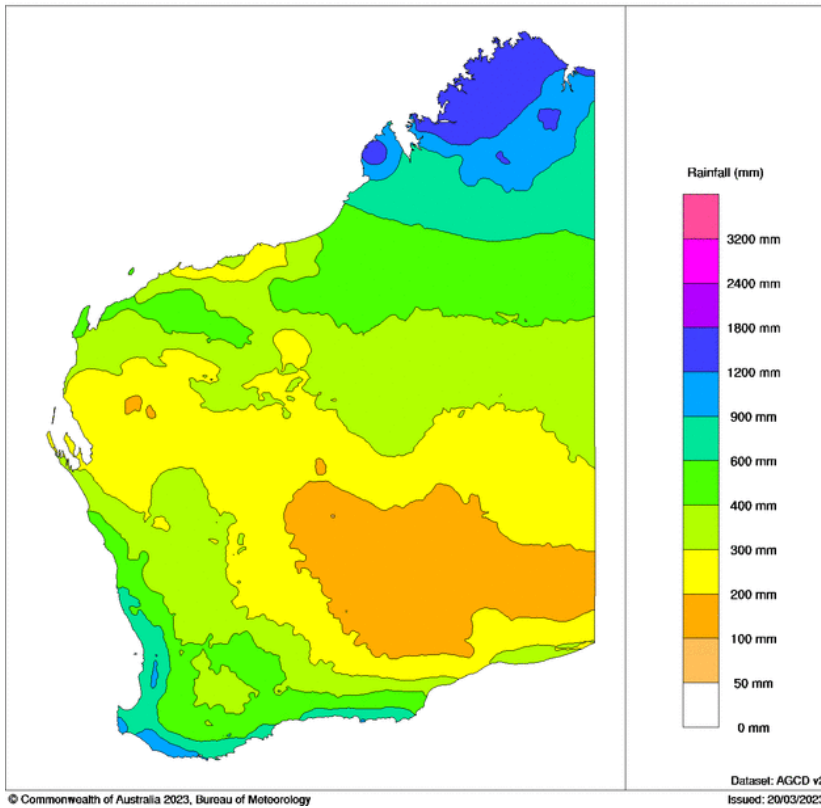


Figure 4. Rainfall totals for Western Australia for the 2022 calendar year.

Western Australian rainfall deficiencies 1 January to 31 December 2022

Australian Gridded Climate Data

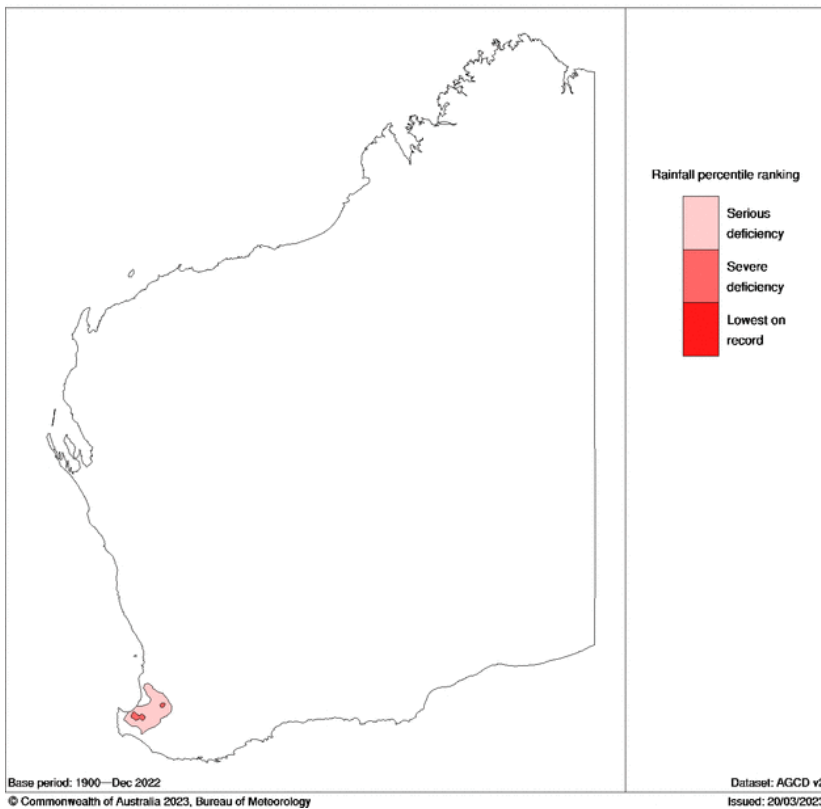
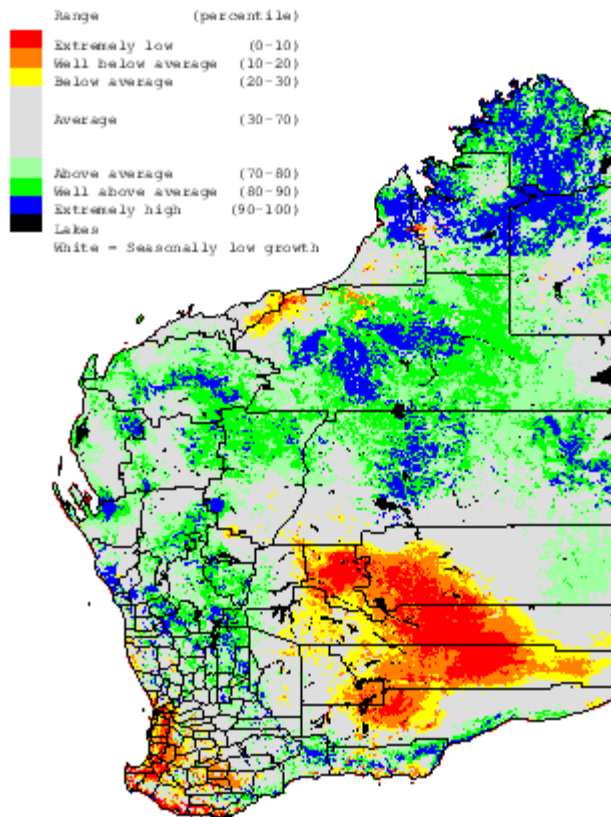


Figure 5. Drought map for Western Australia for the 2022 calendar year.

Pasture Growth Percentile Relative to Historical Records from 1957 January to December 2022



www.LongPaddock.qld.gov.au

Figure 6. Pasture growth in Western Australia relative to historical records from 1957.

3.2 Disease

No significant disease outbreaks were detected or reported in populations of commercially harvested kangaroo species in Western Australia in 2022.

3.3 Market factors

Limited demand for carcasses from processors continues to contribute to the significant reduction in active shooting of kangaroos for commercial purposes. There has not been a significant increase in demand across the industry.

4 Research activity

No research or adaptive management experiments related to the commercial harvesting of kangaroos were undertaken or sponsored by the Department in 2022.

Data collected from the aerial surveys were used in the preparation of one scientific journal article published in 2022:

Dawson *et al* 2022, Land use and dingo baiting are correlated with the density of kangaroos in rangeland systems. *Integrative Zoology* **18**, 2, 299-315.

5 Assessment of plan actions against performance indicators

Table 4. Assessment of Plan against performance indicators.

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
1	Licence conditions for the commercial taking, processing and dealing of kangaroos will stipulate that kangaroos cannot be shot, sold or received unless they have been taken in accordance with the Commercial Code.	✓	✓	✓	✓		
2	Copies of the Commercial Code will be made available from the department's website.	✓	✓	✓	✓		See: http://www.dpaw.wa.gov.au/plants-and-animals/animals/kangaroo-management-in-western-australia
3	The department will participate in and support any revisions to the nationally-endorsed Commercial Code.	✓	✓	✓	✓		The Department participated in the review of the Code of Practice 2020.

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
4	All prospective commercial kangaroo shooters must have completed an accredited test of marksmanship and completed accredited vocational training in Game Harvester Skill Set as a prerequisite before being issued with a licence to take fauna for commercial products.	✓	✓	✓	✓		900-80638V01 - Game Harvester Skill Set.
5	Audits of licences issued for commercial activities are conducted annually to ensure licences are being issued appropriately in accordance with relevant legislation and departmental policies.	✓	✓	✓	✓		
6	Databases are maintained to ensure licensee information is current and accurate.	✓	✓	✓	✓		
7	Licence conditions are reviewed as required, and amended where necessary.	✓	✓	✓	✓		The Department participated in the review of the Code of Practice 2020.

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
8	Licensees are advised in writing of any changes to licence conditions within one month of such changes being approved by the CEO or delegate.	✓	✓	✓	✓		
9	All active kangaroo processing establishments are inspected by authorised departmental officers annually to ensure compliance with legislative requirements.	✗	✗	✗	✗		80% of establishments were inspected in 2022.
10	At least thirty percent of active chillers are inspected by authorised departmental officers annually to ensure compliance with legislative requirements.	✗	✓	✓	✗		25% of active chillers were inspected in 2022. This KPI is very difficult to meet due to the vagrant nature of shooters.

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
11	Reports of unlicensed activities and activities in breach of legislation and licence conditions are investigated to the fullest extent possible and, where sufficient evidence is available, offenders are issued with expiation notices or prosecuted as appropriate.	✓	✓	✓	✓		Government has a robust set of guidelines, policies, and procedures for investigating offences and determining compliance action outcomes. This is the standard that should be reflected in the KPI.
12	Incoming industry returns are reviewed, and discrepancies are investigated.	✓	✓	✓	✓		
13	A compliance database will be maintained and improved to support investigations and inspections.	✓	✓	✓	✓		A revised compliance database is in development.
14	Aerial surveys are undertaken triennially for each monitoring zone and population estimates are calculated in accordance with the Management Plan.	✓	✓	✓	✓		
15	Commercial harvest quotas are set in accordance with the Management Plan.	✓	✓	✓	✓		

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
16	Population Monitoring Zone quotas and the state-wide quotas are never exceeded.	✓	✓	✓	✓		
17	The Commonwealth Government is advised of commercial harvest quotas via a quota report for the following calendar year by 30 November.	✗	✗	✗	✗		The Commonwealth was advised of the commercial harvest quota on 7 January 2023.
18	The quota report will be made available to the public via the department's website.	✓	✓	✓	✓		See: http://www.dpaw.wa.gov.au/plants-and-animals/animals/kangaroo-management-in-western-australia
19	Sudden, sustained or acute changes in the information provided through harvest returns will be investigated to identify possible causes of the change.	✓	✓	✓	✓		

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
20	Commercial kangaroo harvest rates will be reduced or the commercial kangaroo harvest suspended if density estimates reach the thresholds identified in the management plan (WAKMP 2019-2023 Table 2). Any suspensions or reductions will remain in place until surveys or data indicates that kangaroo densities have increased above density thresholds.	✓	✓	✓	✓		
21	Changes to the kangaroo management program will be communicated to relevant stakeholders via the department's website and directly to stakeholders where appropriate.	✓	✓	✓	✓		
22	During the life of the Management Plan, the department will support research on harvested species of kangaroos or commercial harvest management as appropriate.	✓	✓	✓	✓		

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
23	All proposals to undertake active adaptive management experiments are reviewed and assessed by the department in accordance with the criteria outlined in the Management Plan.	✓	✓	✓	✓		
24	As a minimum, trends in population estimates, harvest tallies, carcass weights and sex ratios will be analysed annually and published on the department's website in annual and quota reports.	✓	✓	✓	✓		
25	An annual report will be provided to the Commonwealth Government by 31 March of the following year.	✗	✓	✗	✗		The Commonwealth was provided the 2021 annual report on 14 June 2022.
26	KMAC meets at least once per year to review the progress of the Management Plan in relation to the goal and aims of the plan.	✓	✓	✓	✓		

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
27	KMAC is provided with annual updates on the commercial harvest and issue of tags issue throughout the life of the Management Plan.	✓	✓	✓	✓		
28	KMAC is provided with other relevant information as required or as necessary throughout the life of the Management Plan.	✓	✓	✓	✓		
29	<p>Throughout the life of the Management Plan, the department's website will contain the following information as a minimum standard:</p> <ul style="list-style-type: none"> • the current management plan; • the current quota report; • the current annual report submitted to the Commonwealth Government; • information sheets on kangaroo biology and management; • the Commercial Code; and • relevant contact information. 	✓	✓	✓	✓		<p>See: http://www.dpaw.wa.gov.au/plants-and-animals/animals/kangaroo-management-in-western-australia</p>

Performance Indicator	Description	Year					Comments
		2019	2020	2021	2022	2023	
30	Publicly available information on kangaroo management is provided to interested parties as soon as practicable on request.	✓	✓	✓	✓		
31	Relevant departmental staff will participate in interviews with the media where appropriate.	✓	✓	✓	✓		
32	Media releases are prepared for issues of interest to the community when appropriate.	✓	✓	✓	✓		
33	As a minimum, all first time commercial kangaroo licence holders, or those who have not held a valid licence during the term of the current Management Plan, will be provided with an up to date information pack to make licence holders aware of relevant requirements and responsibilities.	✓	✓	✓	✓		

Appendices

Appendix 1 Harvest statistics for monitoring zones

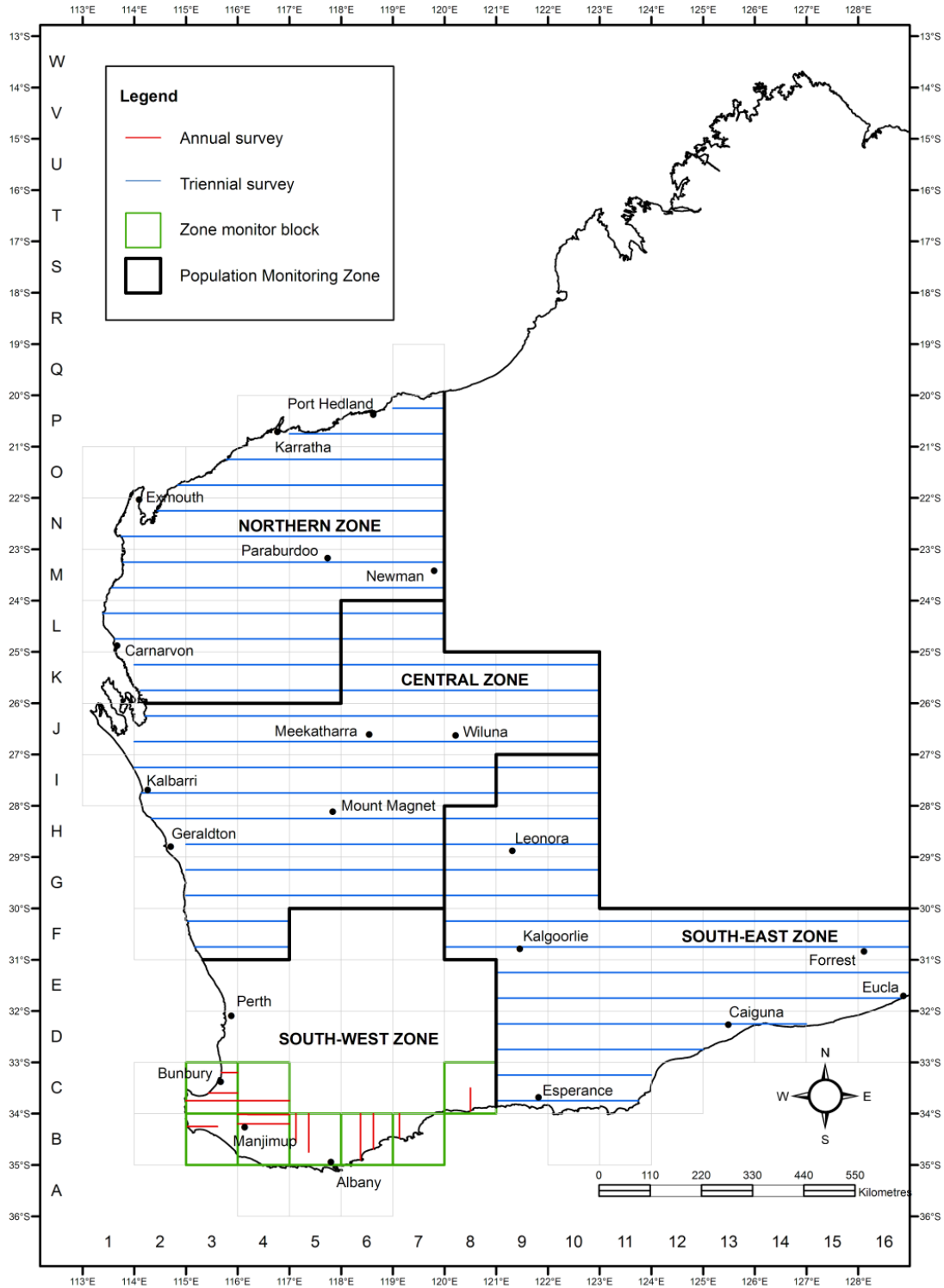


Figure 7. Map of Population monitoring zones for commercial harvesting of kangaroos in Western Australia.

Northern zone

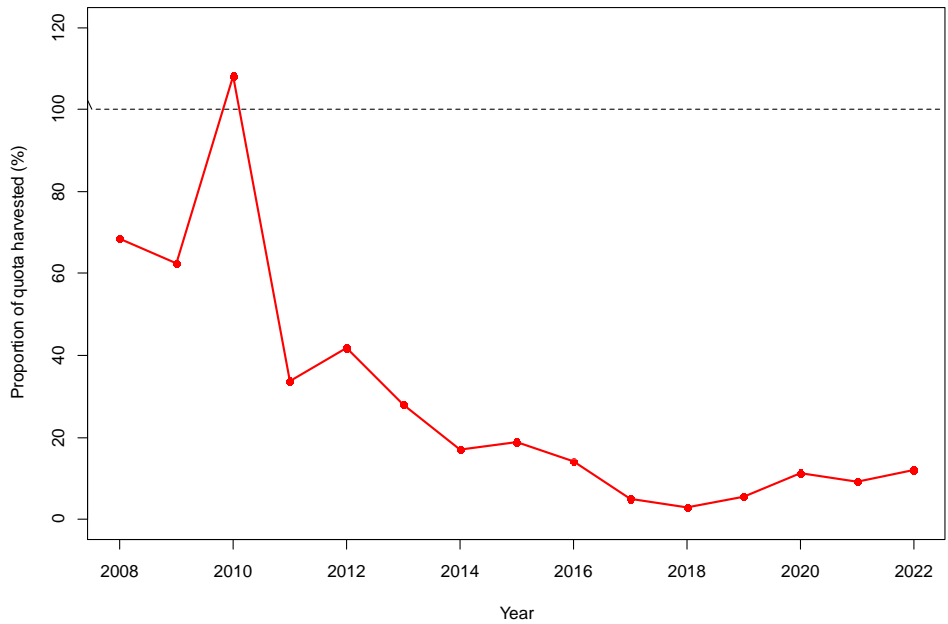


Figure 8. Proportion of total quota harvested (%) for red kangaroos in the Northern Zone.

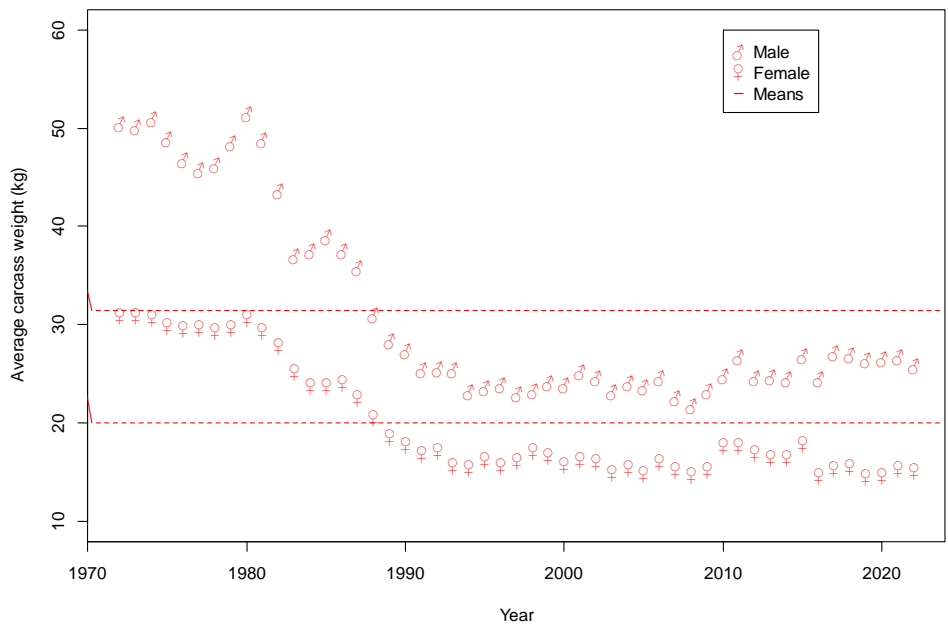


Figure 9. Average carcass weight of male and female red kangaroos harvested in the Northern Zone. The upper red dashed line represents the average carcass weight for male kangaroos across all years and the lower red dashed line is the average carcass weight for females.

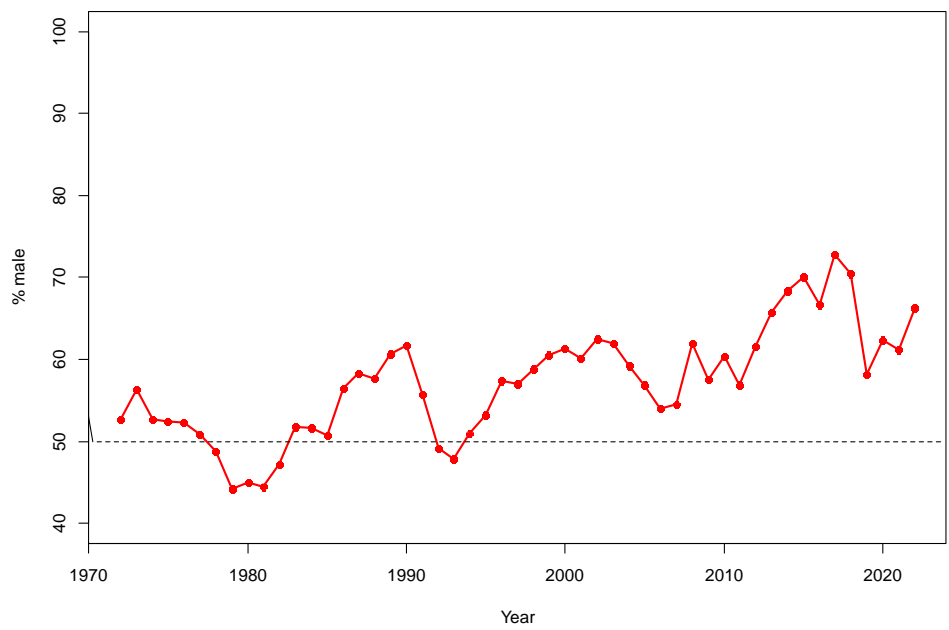


Figure 10. Sex ratio (expressed as a percentage) of male to female red kangaroos harvested in the Northern Zone.

Central zone



Figure 11. Proportion of total quota harvested (%) for red and western grey kangaroos in the Central Zone.

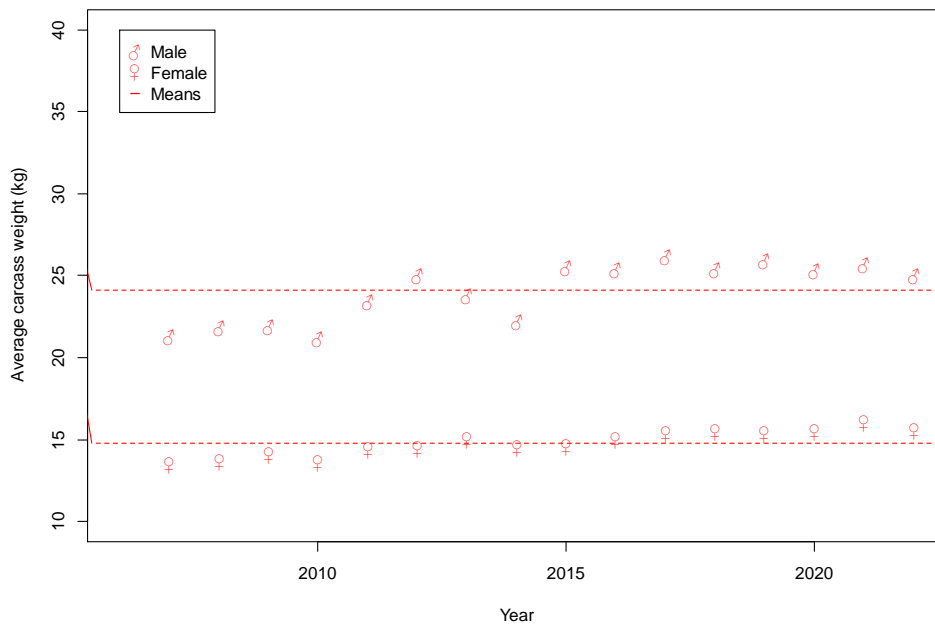


Figure 12. Average carcass weight of male and female red kangaroos harvested in the Central Zone. The upper red dashed line represents the average carcass weight for male kangaroos across all years and the lower red dashed line is the average carcass weight for females.

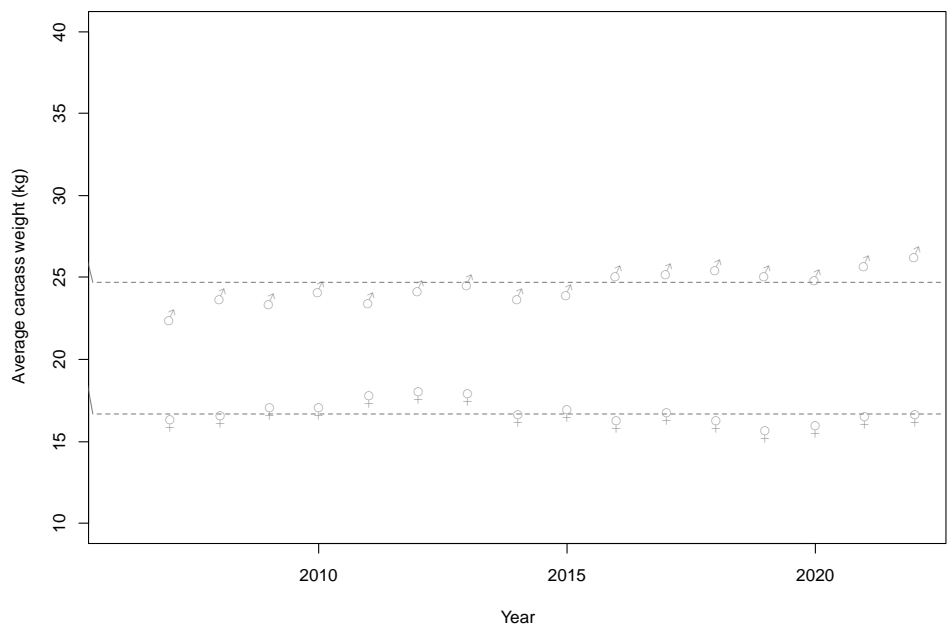


Figure 13. Average carcass weight of male and female western grey kangaroos harvested in the Central Zone. The upper grey dashed line represents the average carcass weight for male kangaroos across all years and the lower grey dashed line is the average carcass weight for females.

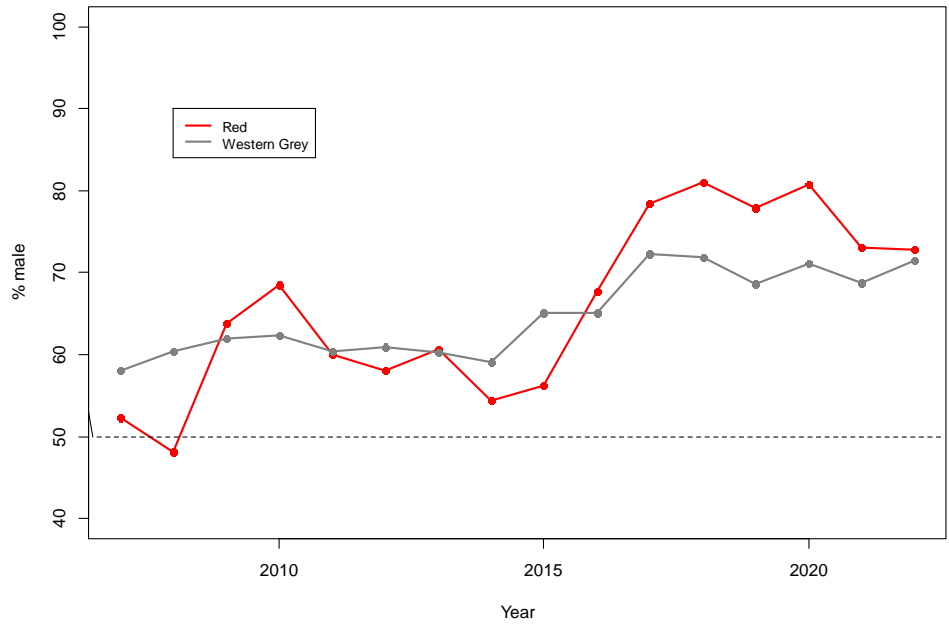


Figure 14. Sex ratio (expressed as a percentage) of male to female kangaroos harvested in the Central Zone.

South east zone

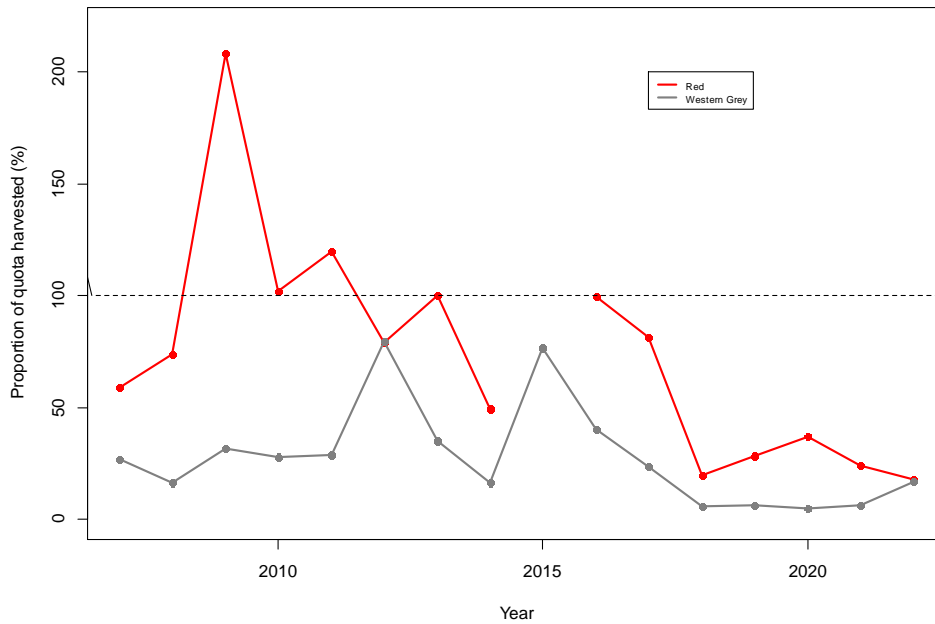


Figure 15. Proportion of total quota harvested (%) for red and western grey kangaroos in the South East Zone. Note: No red kangaroo harvest was taken in 2015.

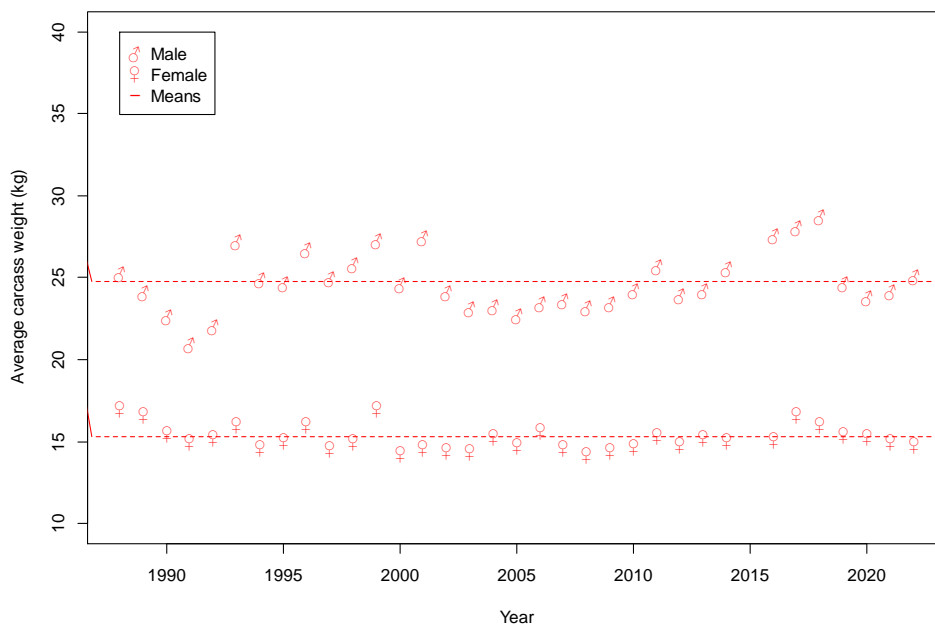


Figure 16. Average carcass weight of male and female red kangaroos harvested in the South East Zone. The upper red dashed line represents the average carcass weight for male kangaroos across all years and the lower red dashed line is the average carcass weight for females.

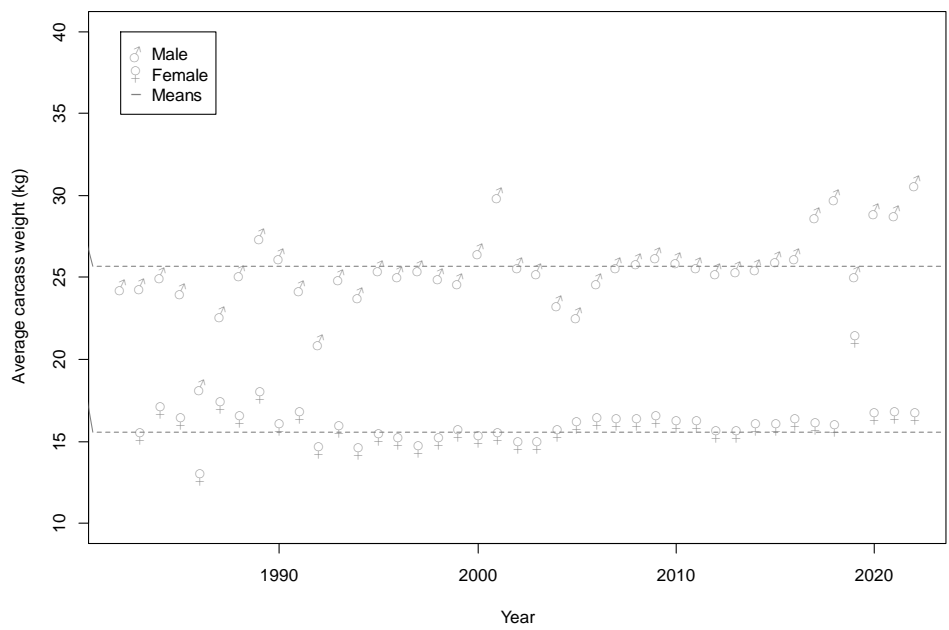


Figure 17. Average carcass weight of male and female western grey kangaroos harvested in the South East Zone. The upper grey dashed line represents the average carcass weight for male kangaroos across all years and the lower grey dashed line is the average carcass weight for females.

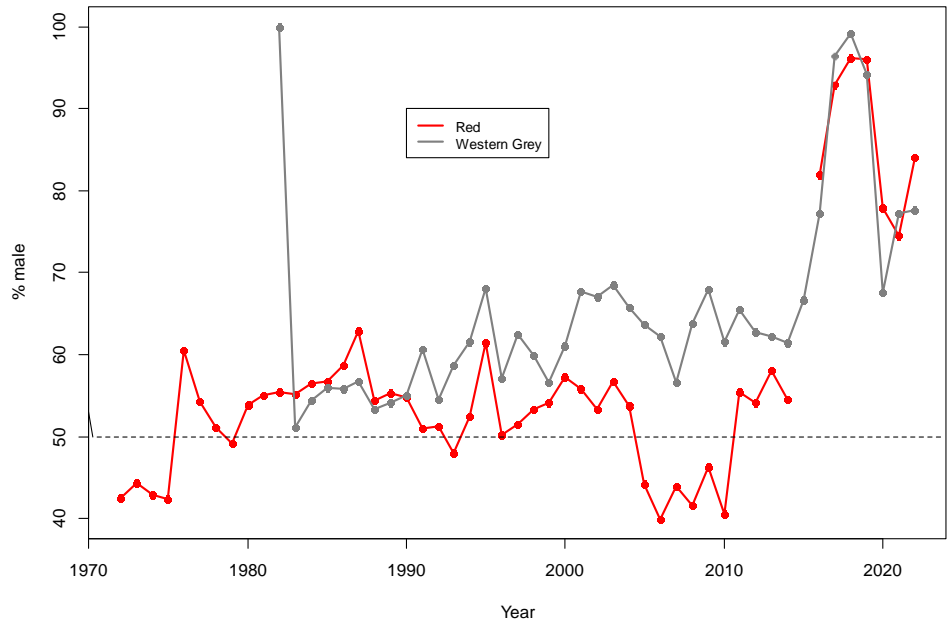


Figure 18. Sex ratio (expressed as a percentage) of male to female kangaroos harvested in the South East Zone. Note: No red kangaroo harvest was taken in 2015.

South west zone

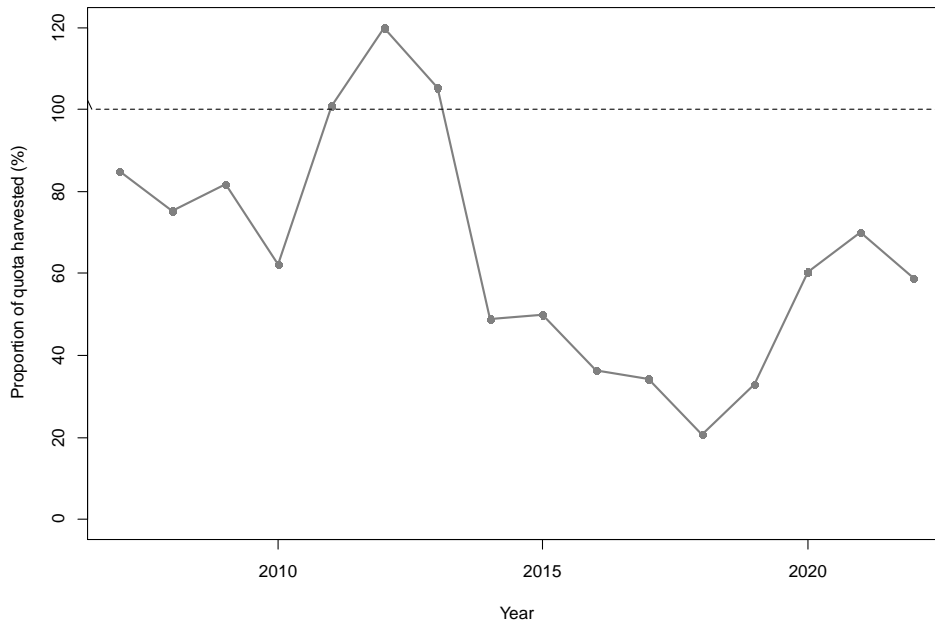


Figure 19. Proportion of total quota harvested (%) for western grey kangaroos in the South West Zone.

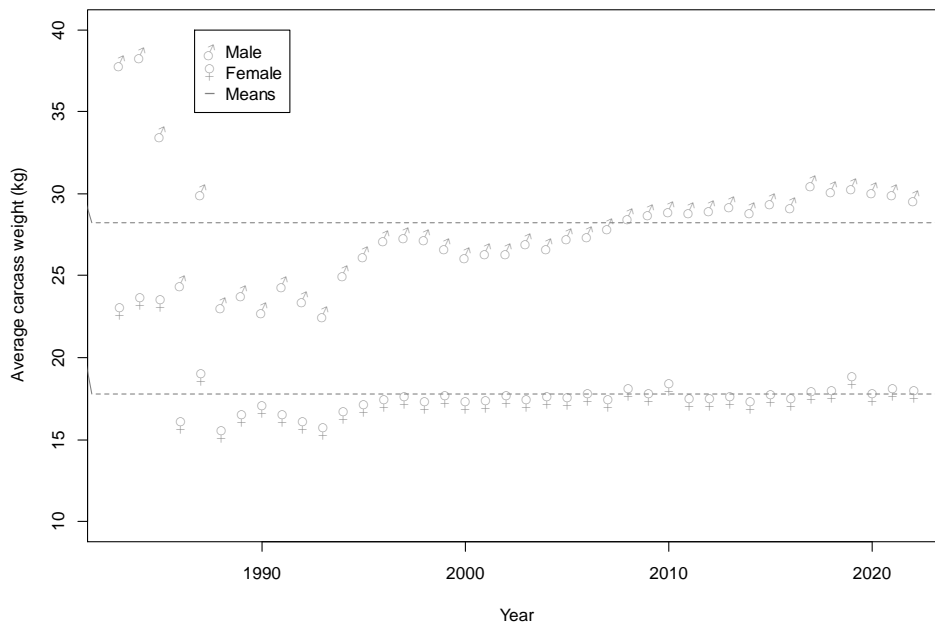


Figure 20. Average carcass weight of male and female western grey kangaroos harvested in the South West Zone. The upper grey dashed line represents the average carcass weight for male kangaroos across all years and the lower grey dashed line is the average carcass weight for females.

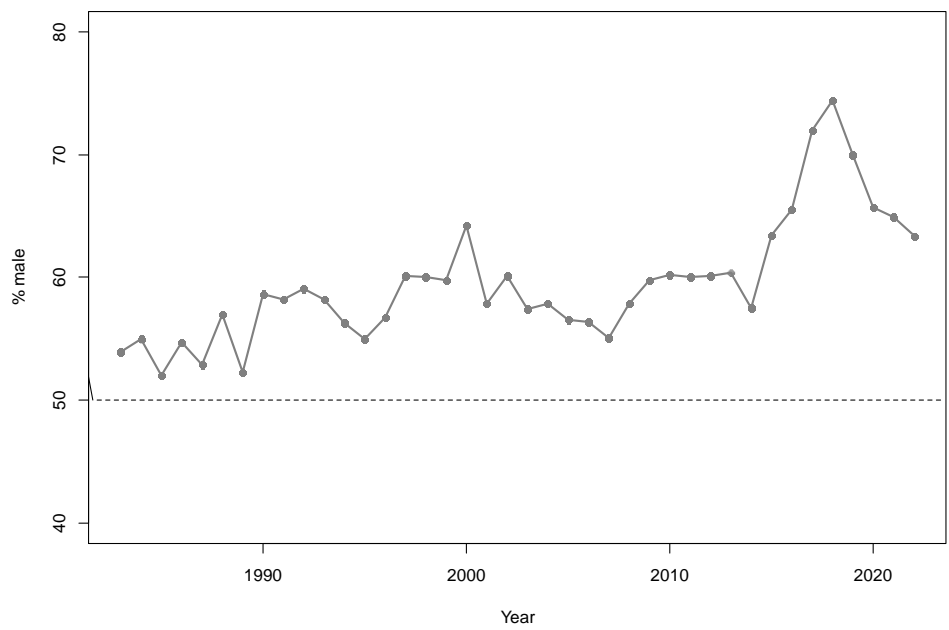


Figure 21. Sex ratio (as a percentage) of male to female western grey kangaroos harvested in the South West Zone.