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The Kangaroo Report

Volume 1

Commercial exploitation, lethal control and population estimates: state analyses

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CHAPTER 1

Commercial Exploitation of Kangaroos in Australia

A State-Level Plausibility Assessment of Population Estimates and Harvest Quotas, 2020–2026

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Prepared 17 September 2026

1.1 Executive Summary

This report examines official state-level data on the commercial exploitation of kangaroos across the five mainland Australian jurisdictions that operate commercial kangaroo industries, New South Wales (NSW), Queensland (QLD), South Australia (SA), Western Australia (WA) and Victoria (VIC), for the period 2020–2026. Tasmania is excluded because it is not required to report under the same national framework, and the Australian Capital Territory and Northern Territory have no commercial kangaroo trade.

The core analytical task is a plausibility test, that is, does the population estimate reported for each state in a given year make biological sense, given (a) the population estimate reported the previous year, (b) the animals removed by the commercial industry, and (c) a ceiling on the rate at which kangaroo populations can reproduce? Kangaroo population ecology places an effective ceiling on net annual population growth, this report adopts a maximum net reproductive (intrinsic) rate of 10 per cent per annum as a generous upper bound consistent with published macropod demographic studies. Any reported year-on-year population increase that exceeds what is achievable at a 10 per cent growth ceiling, once known mortality is accounted for, is flagged as statistically and biologically implausible.

Mortality is modelled as more than the reported commercial "actual take" alone. The published take figures do not include: (i) an estimated additional 20 per cent of deaths occurring on top of the commercial take (crop-protection and non-commercial shooting, vehicle strike, wounding loss, illegal take, and other anthropogenic mortality); and (ii) dependent joeys, which are not counted in official kill data at all but die when their mother is shot, at an assumed rate of 30 per cent of the commercial take. Combined, this implies total kangaroo mortality of approximately 1.5 times the reported commercial take (or 1.5 times the quota, under the full-quota scenario).

Two scenarios are tested for every state and every year:

- Scenario 1: Actual take: the plausibility of reported population estimates given the mortality actually recorded.

- Scenario 2: Full quota met, that is, the plausibility test re-run assuming the full commercial quota had been taken in every year, to assess the population impact the quota-setting process considers acceptable.

Across 30 year-on-year transitions (six per state, five states), a large majority fail the 10 per cent plausibility test under Scenario 2, and roughly half fail it under Scenario 1. Victoria, South Australia and Queensland show the most frequent and largest implied growth rates, in several cases requiring net population growth of 30–70 per cent in a single year, rates that have no basis in kangaroo reproductive biology. Read together with the sustained real-term declines reported in NSW, QLD and especially WA, the pattern is consistent with population estimates and/or quota-setting inputs that are not reliable, and, in the case of WA, with a genuine and severe population collapse largely uncontradicted by the plausibility test.

On a combined assessment of (a) the scale and credibility of reported decline, (b) the extent to which reported estimates fail the reproduction-ceiling test, and (c) the share of the quota actually being utilised as a proxy for pressure on the remaining population, the states are ranked below from greatest to least likely risk of endangerment to their kangaroo populations:

- **1. Western Australia – highest risk**
- **2. Victoria – high risk**
- **3. South Australia – high risk**
- **4. New South Wales – moderate risk**
- **5. Queensland – moderate-to-lower relative risk (but largest absolute exploitation)**

The rationale for this ranking is set out in Section 1.7.

1.2 Source Data

Table 1.1 reproduces the reported data by state and year: the population estimate on which each year's quota is based, the commercial quota, the actual reported take, and actual take as a percentage of quota. Figures for 2026 actual take are the Nature Knowledge Channel's forecast; other 2026 figures were the latest available estimates at the time of writing. Western Australia had not published its actual 2025 take at the time of writing.

Table 1.1. Commercial exploitation of kangaroos in Australia by mainland state, 2020–2026 (population estimate, quota, actual take, take as % of quota).

State	Year	Population estimate (basis of quota)	Quota (commercial)	Actual take	Actual take (% of quota)
NSW	2020	14,158,405	2,126,176	469,186	22%
NSW	2021	10,459,983	1,598,761	497,285	31%
NSW	2022	10,913,343	1,692,207	402,719	24%
NSW	2023	11,882,215	1,850,228	509,671	27%
NSW	2024	9,634,900	1,484,072	532,415	36%
NSW	2025	13,910,688	2,186,952	634,087	29%
NSW	2026	9,586,809	1,453,025	547,000	37%
QLD	2020	22,287,000	2,825,150	514,144	18%
QLD	2021	16,663,850	1,981,150	601,164	30%
QLD	2022	12,959,400	1,783,850	612,233	34%
QLD	2023	16,267,200	2,210,400	597,750	27%
QLD	2024	17,727,700	2,486,400	516,847	20%
QLD	2025	19,948,800	2,941,550	609,842	21%
QLD	2026	19,308,148	2,850,900	568,000	20%

State	Year	Population estimate (basis of quota)	Quota (commercial)	Actual take	Actual take (% of quota)
SA	2020	3,545,902	532,400	98,962	19%
SA	2021	2,810,547	449,200	97,389	22%
SA	2022	2,775,048	455,800	100,896	22%
SA	2023	3,833,889	576,300	100,088	17%
SA	2024	3,912,711	589,200	106,503	18%
SA	2025	5,192,277	883,500	127,903	14%
SA	2026	4,129,219	600,400	103,000	17%
WA	2020	3,090,605	489,130	100,893	21%
WA	2021	2,412,050	381,880	85,613	22%
WA	2022	2,399,190	375,410	82,214	22%
WA	2023	2,156,550	328,470	81,938	25%
WA	2024	1,695,390	263,935	80,306	30%
WA	2025	1,304,090	182,390	74,000	40%
WA	2026	1,364,695	191,880	78,000	40%
VIC	2020	1,378,605	57,900	46,064	80%
VIC	2021	1,911,550	95,680	61,732	64%
VIC	2022	1,858,150	127,850	68,346	53%
VIC	2023	2,363,850	166,750	72,232	43%
VIC	2024	2,363,850	155,650	81,160	52%
VIC	2025	2,078,000	117,600	76,353	65%
VIC	2026	2,306,000	95,450	73,000	76%
Total (mainland Australia)					
Australia	2020	44,460,517	6,030,756	1,229,249	20%
Australia	2021	34,257,980	4,506,671	1,343,183	29%
Australia	2022	30,905,131	4,435,117	1,266,408	28%
Australia	2023	36,503,704	5,132,148	1,361,679	26%
Australia	2024	35,334,551	4,979,257	1,317,231	26%
Australia	2025	42,163,953	6,311,992	1,522,185	24%
Australia	2026	36,830,176	5,191,655	1,369,000	26%

1.3 Methodology: The Reproduction-Ceiling Plausibility Test

The test compares each state's reported population estimate in year t+1 against the maximum population that could plausibly exist, given the population estimate in year t, a 10 per cent per annum ceiling on net reproduction, and total kangaroo mortality in year t. It is expressed as:

$$\textit{Maximum plausible population (t+1)} = \textit{Population (t)} \times 1.10 - \textit{Total mortality (t)}$$

Total mortality (t) is calculated as 1.5 × the relevant harvest figure, reflecting three components:

- 1.0 × reported actual commercial take (or full quota, in Scenario 2);
- +0.2 × take, for additional deaths occurring alongside the commercial harvest but outside the official kill count (crop-protection permits, vehicle strike, wounding loss and illegal take);
- +0.3 × take, for dependent joeys that die with their shot mothers and are never entered into commercial kill data.

Where the population reported for year t+1 exceeds the maximum plausible population, the estimate is flagged as implausible, and the “implied growth rate”, the net reproduction rate that would have been

needed to reconcile the reported figures, is reported alongside it. Any implied growth rate above 10 per cent indicates the reported figures cannot both be true under a biologically credible reproduction rate; the higher the implied rate, the less credible the estimate.

This is a deliberately conservative test. A 10 per cent ceiling is at the generous end of published estimates of intrinsic growth rates for large kangaroo species, which are typically constrained by a single young per year, a gestation and pouch period exceeding 12 months, density-dependent effects, and periodic drought-driven mortality. Using a generous ceiling means that any transition still flagged as implausible represents a materially significant anomaly, not a marginal one.

1.4 Scenario 1: Impact of Actual Take on State Populations

This scenario applies the mortality model to the take that was actually reported each year. Rows shaded pink fail the plausibility test, the reported population the following year could not be reached even under a generous 10 per cent growth ceiling, once total estimated mortality is deducted.

1.4.1 New South Wales

Table 1.2. NSW – Scenario 1 plausibility test (actual take).

Year (t)	Year (t+1)	Pop. est. year t	Actual take (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	14,158,405	469,186	703,779	14,870,467	10,459,983	-21.2%
2021	2022	10,459,983	497,285	745,928	10,760,054	**10,913,343**	**+11.5%**
2022	2023	10,913,343	402,719	604,078	11,400,599	**11,882,215**	**+14.4%**
2023	2024	11,882,215	509,671	764,506	12,305,930	9,634,900	-12.5%
2024	2025	9,634,900	532,415	798,622	9,799,768	**13,910,688**	**+52.7%**
2025	2026	13,910,688	634,087	951,130	14,350,626	9,586,809	-24.2%

1.4.2 Queensland

Table 1.3. QLD – Scenario 1 plausibility test (actual take).

Year (t)	Year (t+1)	Pop. est. year t	Actual take (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	22,287,000	514,144	771,216	23,744,484	16,663,850	-21.8%
2021	2022	16,663,850	601,164	901,746	17,428,489	12,959,400	-16.8%
2022	2023	12,959,400	612,233	918,350	13,336,991	**16,267,200**	**+32.6%**
2023	2024	16,267,200	597,750	896,625	16,997,295	**17,727,700**	**+14.5%**
2024	2025	17,727,700	516,847	775,270	18,725,200	**19,948,800**	**+16.9%**
2025	2026	19,948,800	609,842	914,763	21,028,917	19,308,148	+1.4%

1.4.3 South Australia

Table 1.4. SA – Scenario 1 plausibility test (actual take).

Year (t)	Year (t+1)	Pop. est. year t	Actual take (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	3,545,902	98,962	148,443	3,752,049	2,810,547	-16.6%
2021	2022	2,810,547	97,389	146,084	2,945,518	2,775,048	+3.9%
2022	2023	2,775,048	100,896	151,344	2,901,209	**3,833,889**	**+43.6%**
2023	2024	3,833,889	100,088	150,132	4,067,146	3,912,711	+6.0%
2024	2025	3,912,711	106,503	159,754	4,144,228	**5,192,277**	**+36.8%**
2025	2026	5,192,277	127,903	191,854	5,519,650	4,129,219	-16.8%

1.4.4 Western Australia

Table 1.5. WA – Scenario 1 plausibility test (actual take).

Year (t)	Year (t+1)	Pop. est. year t	Actual take (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	3,090,605	100,893	151,340	3,248,326	2,412,050	-17.1%
2021	2022	2,412,050	85,613	128,420	2,524,836	2,399,190	+4.8%
2022	2023	2,399,190	82,214	123,321	2,515,788	2,156,550	-5.0%
2023	2024	2,156,550	81,938	122,907	2,249,298	1,695,390	-15.7%
2024	2025	1,695,390	80,306	120,459	1,744,470	1,304,090	-16.0%
2025	2026	1,304,090	74,000	111,000	1,323,499	**1,364,695**	**+13.2%**

1.4.5 Victoria

Table 1.6. VIC – Scenario 1 plausibility test (actual take).

Year (t)	Year (t+1)	Pop. est. year t	Actual take (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	1,378,605	46,064	69,096	1,447,370	**1,911,550**	**+43.7%**
2021	2022	1,911,550	61,732	92,598	2,010,107	1,858,150	+2.1%
2022	2023	1,858,150	68,346	102,519	1,941,446	**2,363,850**	**+32.7%**
2023	2024	2,363,850	72,232	108,348	2,491,887	2,363,850	+4.6%
2024	2025	2,363,850	81,160	121,740	2,478,495	2,078,000	-6.9%
2025	2026	2,078,000	76,353	114,530	2,171,270	**2,306,000**	**+16.5%**

1.5 Scenario 2: Impact if Full Quotas Had Been Met

This scenario re-runs the same test assuming the full commercial quota was taken every year, rather than the lower actual take. It tests the population consequence the quota-setting process itself treats as sustainable, in other words, whether the quotas that governments set are themselves compatible with the population estimates they are based on.

The results are materially worse than Scenario 1 in every state. Where actual take is well below quota (as it has been in every state in every year in this dataset, national utilisation has ranged from 20 to 29 per cent) in the period analysed, the gap between the quota and actual take has buffered populations from the full theoretical impact of the quota system and the quota is in effect meaningless as a mechanism for stopping the over exploitation of kangaroos because of the overstated population estimates from which the quotas are based.

Scenario 2 shows that this buffer, not the quota-setting methodology itself, is doing the work of keeping outcomes closer to plausible: had hunters taken their full legal entitlement in any of these years, most states would show population trajectories inconsistent with any credible reproduction rate.

1.5.1 New South Wales

Table 1.7. NSW – Scenario 2 plausibility test (full quota met).

Year (t)	Year (t+1)	Pop. est. year t	Full quota (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	14,158,405	2,126,176	3,189,264	12,384,982	10,459,983	-3.6%
2021	2022	10,459,983	1,598,761	2,398,142	9,107,840	**10,913,343**	**+27.3%**
2022	2023	10,913,343	1,692,207	2,538,310	9,466,367	**11,882,215**	**+32.1%**
2023	2024	11,882,215	1,850,228	2,775,342	10,295,095	9,634,900	+4.4%
2024	2025	9,634,900	1,484,072	2,226,108	8,372,282	**13,910,688**	**+67.5%**
2025	2026	13,910,688	2,186,952	3,280,428	12,021,329	9,586,809	-7.5%

1.5.2 Queensland

Table 1.8. QLD – Scenario 2 plausibility test (full quota met).

Year (t)	Year (t+1)	Pop. est. year t	Full quota (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	22,287,000	2,825,150	4,237,725	20,277,975	16,663,850	-6.2%
2021	2022	16,663,850	1,981,150	2,971,725	15,358,510	12,959,400	-4.4%
2022	2023	12,959,400	1,783,850	2,675,775	11,579,565	**16,267,200**	**+46.2%**
2023	2024	16,267,200	2,210,400	3,315,600	14,578,320	**17,727,700**	**+29.4%**
2024	2025	17,727,700	2,486,400	3,729,600	15,770,870	**19,948,800**	**+33.6%**
2025	2026	19,948,800	2,941,550	4,412,325	17,531,355	**19,308,148**	**+18.9%**

1.5.3 South Australia

Table 1.9. SA – Scenario 2 plausibility test (full quota met).

Year (t)	Year (t+1)	Pop. est. year t	Full quota (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	3,545,902	532,400	798,600	3,101,892	2,810,547	+1.8%
2021	2022	2,810,547	449,200	673,800	2,417,802	**2,775,048**	**+22.7%**
2022	2023	2,775,048	455,800	683,700	2,368,853	**3,833,889**	**+62.8%**
2023	2024	3,833,889	576,300	864,450	3,352,828	**3,912,711**	**+24.6%**
2024	2025	3,912,711	589,200	883,800	3,420,182	**5,192,277**	**+55.3%**
2025	2026	5,192,277	883,500	1,325,250	4,386,255	4,129,219	+5.0%

1.5.4 Western Australia

Table 1.10. WA – Scenario 2 plausibility test (full quota met).

Year (t)	Year (t+1)	Pop. est. year t	Full quota (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	3,090,605	489,130	733,695	2,665,971	2,412,050	+1.8%
2021	2022	2,412,050	381,880	572,820	2,080,435	**2,399,190**	**+23.2%**
2022	2023	2,399,190	375,410	563,115	2,075,994	**2,156,550**	**+13.4%**
2023	2024	2,156,550	328,470	492,705	1,879,500	1,695,390	+1.5%
2024	2025	1,695,390	263,935	395,902	1,469,027	1,304,090	+0.3%
2025	2026	1,304,090	182,390	273,585	1,160,914	**1,364,695**	**+25.6%**

1.5.5 Victoria

Table 1.11. VIC – Scenario 2 plausibility test (full quota met).

Year (t)	Year (t+1)	Pop. est. year t	Full quota (t)	Total assumed mortality (×1.5)	Max. plausible pop. at t+1 (10% cap)	Reported pop. estimate t+1	Implied growth
2020	2021	1,378,605	57,900	86,850	1,429,616	**1,911,550**	**+45.0%**
2021	2022	1,911,550	95,680	143,520	1,959,185	1,858,150	+4.7%
2022	2023	1,858,150	127,850	191,775	1,852,190	**2,363,850**	**+37.5%**
2023	2024	2,363,850	166,750	250,125	2,350,110	**2,363,850**	**+10.6%**
2024	2025	2,363,850	155,650	233,475	2,366,760	2,078,000	-2.2%
2025	2026	2,078,000	117,600	176,400	2,109,400	**2,306,000**	**+19.5%**

1.6 Discussion of Abnormalities

1.6.1 Frequency and scale of implausible transitions

Table 1.12. Summary of plausibility test failures and net population change by state, 2020–2026.

State	Implausible transitions (Actual-take test)	Implausible transitions (Full-quota test)	Mean implied growth required (actual take)	Mean implied growth required (full quota)	Net reported population change 2020–2026
WA	1 of 6	3 of 6	-6.0%	11.0%	-55.8%
VIC	3 of 6	4 of 6	15.4%	19.2%	+67.3%
SA	2 of 6	4 of 6	9.5%	28.7%	+16.5%
NSW	3 of 6	3 of 6	3.5%	20.0%	-32.3%
QLD	3 of 6	4 of 6	4.5%	19.6%	-13.4%

Under Scenario 1 (actual take), between one (WA) and three (NSW, QLD, VIC) of the six year-on-year transitions per state fail the 10 per cent reproduction ceiling. Under Scenario 2 (full quota), this rises to three or four of six transitions in every state without exception. In the worst individual cases, NSW 2024–2025 (implied growth of 52.7–67.5 per cent), SA 2022–2023 (43.6–62.8 per cent), and VIC 2020–2021 and 2022–2023 (32.7–45.0 per cent) — the population increase reported cannot be reconciled with any credible kangaroo reproduction rate, even before accounting for drought years, which reduce reproduction well below the 10 per cent ceiling rather than pushing it above.

1.6.2 Volatility inconsistent with a stable estimation methodology

NSW's reported population estimate swings by more than 40 per cent from one year to the next on several occasions (for example, 13.9 million in 2025 to 9.6 million in 2026, a fall of 31 per cent in a single year, following a rise of 44 per cent the year before). Populations of long-lived, slow-breeding mammals

do not genuinely move this way year to year; this pattern is far more consistent with survey methodology, aerial correction factors, or extrapolation assumptions changing between years than with real demographic change.

Victoria's own reported data shows an identical population estimate for 2023 and 2024 (2,363,850 in both years) while both quota and take changed, an internal inconsistency suggesting the 2024 figure was not independently derived from a new survey. A survey occurred in late 2024, from which the 2025 population and quota was derived.

Queensland's estimates are singled out in the source material as accounting for a disproportionate 54.7 per cent of the mainland population estimate and 57 per cent of the mainland quota in 2026, despite QLD's own reported take-against-quota percentage being amongst the lowest of all states (18–34 per cent), a combination that, if the QLD estimate is inflated as suggested, would materially distort the national picture and understate real exploitation pressure everywhere else.

1.6.3 Reported increases running counter to known pressures

Victoria and South Australia both report net population increases over 2020–2026 (+67.3 per cent and +16.5 per cent respectively) despite: continuous commercial harvest throughout the period; South Australia's documented 30-year history of serial year-on-year decline attributed to over-exploitation; and, in South Australia's case, a new 2025 state government bounty scheme (with $350,000 committed to incentivise primary producers to remove kangaroos) that adds an unknown and unmeasured quantity of additional mortality not captured anywhere in the commercial take figures used in this analysis. Under the plausibility test, South Australia's reported trajectory requires implied growth of up to 62.8 per cent in a single year (2022–2023) to be true, more than six times the assumed biological ceiling.

The source data also notes that South Australia's inclusion of the Kangaroo Island Tammar Wallaby on its commercial species list, at a population density estimate of 87 animals per square kilometre against an actual 2025 commercial take of zero, inflates the state's aggregate population estimate and its apparent sustainability, while contributing no genuine harvest data against which to test the estimate.

1.6.4 A genuine, and more concerning, exception: Western Australia

Western Australia is the clear outlier in the opposite direction. Its reported population estimate falls in five of six years, from 3.09 million in 2020 to 1.36 million in 2026, a real-term decline of 55.8 per cent, and this decline is largely plausible under the reproduction-ceiling test (only one of six transitions is flagged under Scenario 1). In other words, unlike the other states, WA's numbers are broadly internally consistent: a population in genuine, severe, sustained decline. This is compounded by WA's take-against-quota percentage rising steadily from 21 per cent in 2020 to 40 per cent in 2025 and 2026, the second-highest utilisation rate of any state, meaning a shrinking population is having an increasing share of its numbers removed each year, and WA's commercial list is limited to only two species (Red Kangaroo and Western Grey Kangaroo), thus concentrating this pressure.

1.7 State Endangerment Ranking and Rationale

The ranking below weighs three factors together: (i) the credibility and severity of the reported population trend (a plausible severe decline is a stronger risk signal than an implausible reported increase, but an implausible increase indicates the true trend cannot be verified and may itself be a severe decline masked by unreliable data as is particularly the case in South Australia where high population estimates mask what are catastrophic circumstances of the state’s Macropod species; (ii) the frequency and magnitude of reproduction-ceiling failures; and (iii) the share of quota being utilised, as

a proxy for the intensity of pressure on the remaining population and the size of the safety margin should quotas be fully taken in future.

1. Western Australia: Highest risk

A real, internally consistent, severe decline of 55.8 per cent since 2020, rising quota utilisation to 40 per cent, and a commercial take concentrated on just two species. Unlike every other state, WA's figures are not obviously an artefact of unreliable estimation, they describe a population that is, on the balance of this evidence, genuinely collapsing.

2. Victoria: High risk

The smallest population base of any state by a wide margin, combined with by far the highest and most volatile take-against-quota utilisation of any state (43–80 per cent, versus 14–40 per cent elsewhere), meaning Victoria's quota offers almost no protective buffer. Victoria also has the highest average implied growth rate required to reconcile its reported figures (15.4 per cent under Scenario 1), and the state's own reporting explicitly flags its 2026 reported increase as not credible given the state's history. Victoria, in the last decade has had the largest decline in governance standards of any state in relation to its protection and duty of care for its biodiversity.

3. South Australia: High risk

A well-documented 30-year decline sits behind headline estimates that the plausibility test shows are very likely overstated by a very large margin (mean implied growth of 28.7 per cent under the full-quota scenario, nearly three times the assumed biological ceiling). The 2025 bounty scheme adds a further, currently unquantified, source of mortality on top of an already-inflated baseline, and inclusion of an apparently over-estimated Kangaroo Island wallaby population which further masks the true position.

4. New South Wales: Moderate risk

A substantial real-term decline of 32.3 per cent since 2020 sits alongside the most erratic year-to-year estimate swings of any state as highlighted in the government’s recent kangaroo inquiry, undermining confidence in the estimation methodology in either direction. NSW's larger population base and significant shooting zone extensions provide more of a short-term buffer than Victoria or South Australia, but the instability of its data is itself a warning sign that should not be discounted.

5. Queensland: Moderate risk, but largest absolute exploitation

Queensland shows the smallest percentage decline of the states with a falling trend (13.4 per cent) and retains by far the largest population base, giving it more headroom than any other state in relative terms. However, Queensland accounts for the single largest share of both the national population estimate and the national quota, and its estimates are explicitly identified in the source material as the most distortive to the national picture. Queensland's comparatively low relative risk should therefore be read as a function of scale, not of confidence in the reliability of its data which is inflated; on absolute numbers, Queensland dominates the national outcome and any correction to its estimates would materially change the national risk picture.

1.8 Limitations and Caveats

- The 10 per cent maximum reproduction rate, the additional 20 per cent non-commercial mortality allowance, and the 30 per cent joey mortality allowance are modelling assumptions applied uniformly across states and years for the purpose of this plausibility test. Actual rates vary by

species, season, rainfall and body condition, and will differ between the Red Kangaroo, Eastern Grey, Western Grey and Wallaroo, which are not modelled separately here.

- Population estimates are, in most states, derived from aerial or ground survey data collected in the year prior to the quota year, introducing an inherent lag between the reported estimate and the population it is meant to describe.
- Western Australia's 2025 actual take, and 2026 figures generally across states, were not finalised at the time of writing and are shown as reported estimates or forecasts.
- This report does not have access to the underlying survey methodologies, correction factors or raw aerial transect data used by each state to derive its population estimates; the plausibility test is a top-down consistency check on the published headline figures only, not a re-analysis of primary survey data.
- Tasmania, which exploits three Kangaroo / Wallaby species is excluded throughout, as it is not required (it should be) to report under the same national framework for the commercial exploitation of kangaroos.

1.9 Conclusion

Tested against a generous 10 per cent ceiling on kangaroo reproduction and a realistic accounting of total mortality, commercial take, additional non-commercial deaths, and uncounted joey mortality, the majority of reported state population increases across 2020–2026 are not biologically plausible and become markedly less plausible still when tested against full quota utilisation rather than actual take. Western Australia stands apart as the one state whose reported figures are largely consistent with the mortality it reports, and what the figures are consistent with is a genuine, severe, and ongoing population collapse. **Read together, the pattern across all five states supports the view that current population estimates and quota-setting processes are not a reliable basis for judging the sustainability of the commercial kangaroo industry at a state level.**

CHAPTER 2

Use of Authority to Control Wildlife (ATCW) Permits in Victoria

Permits and animals authorised for lethal control, 2009–2025, with a special section on the killing of koalas

Author Peter Hylands

Report date 1 October 2026

Key findings

- **2025 was a record-scale year.** The Victorian Government issued 4,806 ATCW permits authorising the killing of 230,673 native animals – up 35% (permits) and 30% (animals) on 2024, and 66% above the 2009–24 annual average of 139,089 animals.
- **In one year, 2025 added 10.4%** to everything authorised over the previous 16 years combined. Since 2009, ATCWs have now authorised the killing of 2,456,094 animals under 53,473 permits.
- **Kangaroos dominate.** Eastern Grey Kangaroos alone made up 70.5% of animals authorised in 2025 (162,644), up 47% on 2024. The three kangaroo species together made up 79.3%.
- **Sharp rises for iconic species.** Black Swan authorisations doubled to 1,532 – 10.8 times the long-run average. Bare-nosed Wombats: 4,321 animals under 407 permits (the second-most permits of any species). Cape Barren Goose, Pacific Black Duck, Rainbow Lorikeet and Welcome Swallow were all more than three times their averages.
- **Koalas are not in the ATCW data at all.** Koalas are killed through departmental operations outside the permit system. At least 4,000 koala deaths by government programs are documented since 2013, including the 2025 aerial shooting at Budj Bim National Park (see Section 2.5).
- This report also supports Peter Hylands' analysis of the situation for Red Kangaroos in Victoria which is that Parks Victoria and DEECA are exterminating the species in Victoria.

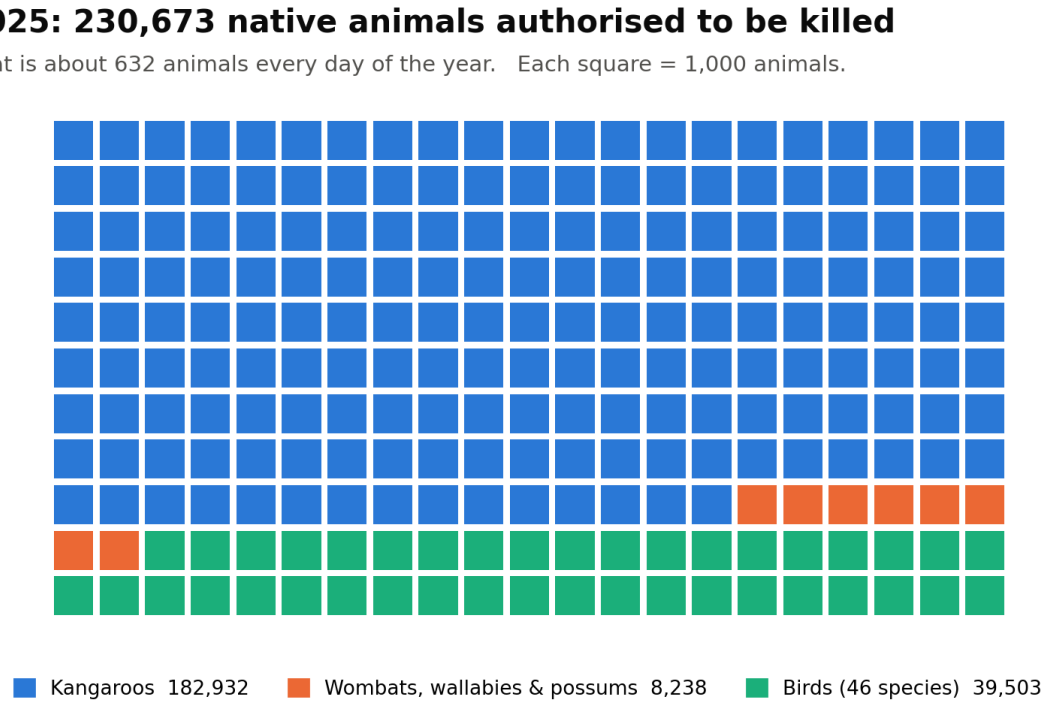


Figure 2.1. Every native animal authorised for killing under ATCWs in 2025, one square per 1,000 animals.

2.1 About ATCWs and this data

Under the Wildlife Act 1975, the Victorian Government (now through the Department of Energy, Environment and Climate Action, DEECA) issues Authorities to Control Wildlife on request to landholders, councils and businesses. They authorise protected native wildlife to be killed or scared.

Once a permit is issued there is no follow-up. The numbers in this report are the maximum number of animals each permit allows. They are not counts of animals actually killed. Nobody checks how many animals were really shot, whether the numbers were exceeded, or how humanely the killing was done. The true death toll could be lower or higher than shown.

The figures cover ATCWs only. They do not include animals killed under other programs – for example commercial kangaroo harvesting, game duck hunting, or the government's own koala operations.

Some names in the table are less familiar: "Black Wallaby" is the Swamp Wallaby, "Maned Duck" is the Australian Wood Duck, and "Bare-nosed Wombat" is the Common Wombat. Averages in this report are 2009–24 totals divided by 16 years.

2.2 ATCW Table

Table 2.1. VICTORIA: Number of Authorities to Control Wildlife (ATCWs) issued for protected Australian species in 2025 and cumulative since 2009, targeted for lethal control

No.	Species	2025 permits	2025 animals	2025 as % of 2009–24 animals	2024 permits	2024 animals	2009–24 permits	2009–24 animals
1	Australasian Gannet	2	80	18.2	1	200	4	440
2	Australian Fur Seal			–			115	335
3	Australian Kestrel			–			4	21
4	Australian King-parrot	1	10	50.0	1	10	3	20
5	Australian Magpie	17	205	3.5	10	371	315	5,825
6	Australian Magpie Lark			–	2	2	70	635
7	Australian Raven	81	3,018	7.6	67	2,539	1,352	39,659
8	Australian Shelduck	20	1,120	12.4	21	688	211	9,044
9	Australian White Ibis	7	305	4.7	8	520	92	6,462
10	Banded Lapwing			–			2	100
11	Bare-nosed Wombat	407	4,321	10.9	330	2,692	3,534	39,783
12	Bell Miner	3	300	32.6			13	920
13	Black Kite			–			15	251
14	Black Swan	32	1,532	67.3	17	747	57	2,277
15	Black Wallaby	184	3,018	11.9	103	1,570	1,991	25,404
16	Black-faced Cuckoo-shrike	1	10	3.3			26	305
17	Black-tailed Native Hen			–			10	240
18	Brolga			–			2	51
19	Brown Goshawk			–			1	8
20	Brushtail Possum	14	424	16.0	12	216	98	2,651
21	Cape Barren Goose	28	1,606	24.3	30	1,737	118	6,619
22	Cattle Egret			–			1	50
23	Chestnut Teal	1	50	5.9	3	130	20	850
24	Crimson Rosella	24	747	7.3	23	767	288	10,204
25	Dingo			–			14	134
26	Dusky Moorhen			–			6	320
27	Eastern Banjo Frog			–			1	10

No.	Species	2025 permits	2025 animals	2025 as % of 2009–24 animals	2024 permits	2024 animals	2009–24 permits	2009–24 animals
28	Eastern Brown Snake			–	1	3	33	408
29	Eastern Grey Kangaroo	3,327	162,644	12.0	2,326	110,663	29,917	1,354,374
30	Eastern Rosella	7	215	6.2	7	250	121	3,460
31	Emu	59	919	6.6	51	886	1,011	14,017
32	Eurasian Coot	1	15	0.7	5	285	42	2,251
33	Fairy Martin			–	1	25	7	453
34	Galah	13	870	2.0	8	820	598	42,874
35	Great Cormorant	4	50	4.8	4	65	57	1,048
36	Grey Butcherbird	1	3	1.2	1	1	26	249
37	Grey Teal	16	390	6.6	20	564	94	5,911
38	Hardhead			–			1	15
39	Laughing Kookaburra	3	3	1.5	1	5	30	199
40	Little Black Cormorant	3	45	5.2	5	70	57	867
41	Little Corella	34	2,245	4.0	41	6,805	530	55,835
42	Little Crow	2	15	3.0	4	400	10	493
43	Little Lorikeet	1	100	1,000.0			1	10
44	Little Pied Cormorant	4	45	5.8	5	70	60	774
45	Little Raven	6	445	10.7	6	315	141	4,146
46	Little Wattlebird	2	20	100.0	1	15	1	20
47	Long-billed Corella	20	1,230	1.8	15	1,510	570	69,833
48	Magpie Goose	1	40	2.6			2	1,510
49	Mallee Ringneck			–	1	100	11	150
50	Maned Duck	136	4,488	8.3	116	4,626	1,685	54,170
51	Masked Lapwing	10	39	0.8	10	59	245	4,790
52	Musk Lorikeet	16	1,310	5.3	19	1,770	390	24,915
53	Noisy Friarbird	4	105	2.7	3	70	374	3,826
54	Noisy Miner	12	115	1.9			144	6,016
55	Pacific Black Duck	50	1,581	20.9	41	1,496	254	7,570
56	Pacific Heron	1	10	500.0			1	2
57	Pied Cormorant			–			1	2
58	Pied Currawong	11	228	3.0	10	185	324	7,596

No.	Species	2025 permits	2025 animals	2025 as % of 2009–24 animals	2024 permits	2024 animals	2009–24 permits	2009–24 animals
59	Purple Swamphen	7	150	28.6	6	80	32	525
60	Rainbow Lorikeet	28	3,410	19.1	24	2,365	298	17,851
61	Red Kangaroo	14	3,869	4.1	25	11,146	169	94,305
62	Red Wattlebird	10	335	6.1	5	215	171	5,468
63	Red-necked Wallaby	17	420	4.4	13	315	292	9,631
64	Richard’s Pipit			–			1	10
65	Ringtail Possum	5	55	12.6	5	29	28	438
66	Rufous Night Heron			–			8	70
67	Satin Bowerbird	1	10	1.1	1	5	53	927
68	Silver Gull	41	9,170	7.5	46	10,902	366	123,032
69	Silvereye	9	220	4.4	8	220	196	4,981
70	Straw-necked Ibis			–	2	85	36	1,081
71	Sulphur-crested Cockatoo	32	1,495	3.5	18	625	768	43,120
72	Tammar Wallaby			–			3	30
73	Welcome Swallow	7	1,159	21.6	4	353	79	5,364
74	Western Grey Kangaroo	65	16,419	17.0	67	7,946	1,014	96,844
75	White-faced Heron	4	45	16.7	3	30	24	269
76	White-winged Chough			–	1	10	11	99
77	Yellow Rosella			–			1	10
78	Yellow-tailed Black-cockatoo			–			11	649
79	Yellow-throated Miner			–			5	315
	TOTAL	**4,806**	**230,673**	**10.4**	**3,558**	**177,573**	**48,667**	**2,225,421**

“–” means no 2025 comparison is possible. Figures are animals authorised, not verified kills.

2.3 2025 compared with 2024 and with the 2009–24 average

Overall

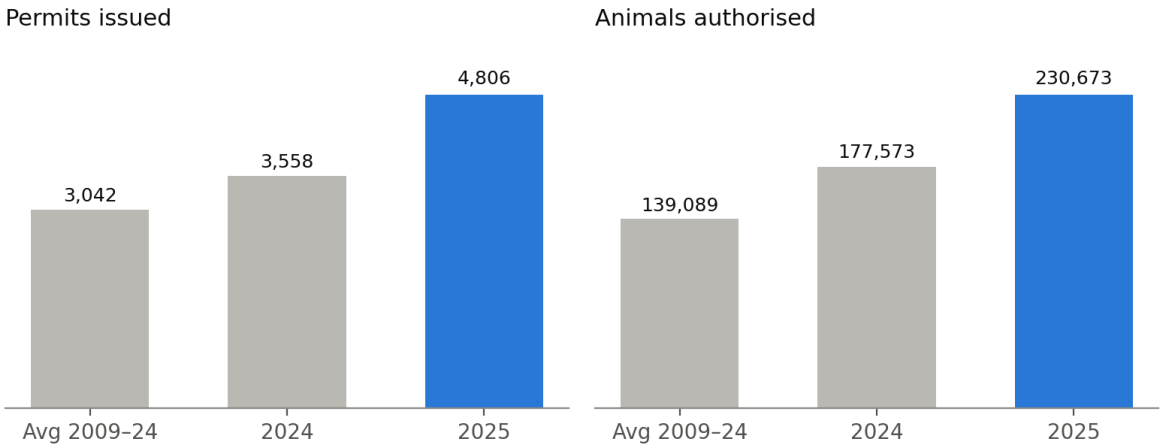


Figure 2.2. Permits issued and animals authorised: 2009–24 annual average, 2024 and 2025.

Permit numbers rose from 3,558 in 2024 to 4,806 in 2025 (+35%). Animals authorised rose from 177,573 to 230,673 (+30%). Against the 2009–24 average, 2025 was 58% higher for permits and 66% higher for animals. The same number of species (54) was targeted in both years.

Most of the increase came from one species. Eastern Grey Kangaroo authorisations rose by 51,981 animals, which is 98% of the whole year-on-year increase. Permits for this species rose from 2,326 to 3,327.

Species well above their long-run average

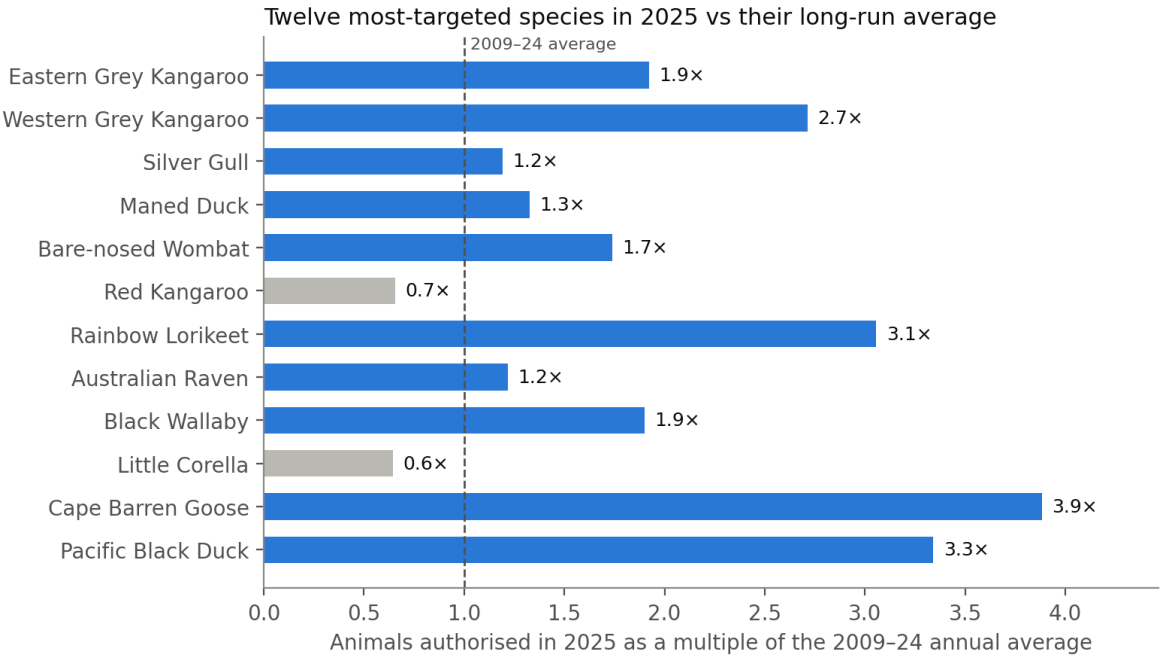


Figure 2.3. Twelve species with the most animals authorised in 2025, shown against their own 2009–24 average (1.0 = average).

The table lists species with at least 300 animals authorised in 2025 that were 1.7 times or more their 2009–24 average.

Table 2.2. Species well above their long-run average: animals authorised in 2025 compared with 2024 and the 2009–24 annual average.

Species	2024 animals	2025 animals	Change vs 2024	2009–24 avg / yr	2025 ÷ avg
Black Swan	747	1,532	+105%	142	10.8×
Bell Miner	0	300	new	58	5.2×
Cape Barren Goose	1,737	1,606	-8%	414	3.9×
Welcome Swallow	353	1,159	+228%	335	3.5×
Pacific Black Duck	1,496	1,581	+6%	473	3.3×
Rainbow Lorikeet	2,365	3,410	+44%	1,116	3.1×
Western Grey Kangaroo	7,946	16,419	+107%	6,053	2.7×
Brushtail Possum	216	424	+96%	166	2.6×
Australian Shelduck	688	1,120	+63%	565	2.0×
Eastern Grey Kangaroo	110,663	162,644	+47%	84,648	1.9×
Black Wallaby	1,570	3,018	+92%	1,588	1.9×
Bare-nosed Wombat	2,692	4,321	+61%	2,486	1.7×
Little Raven	315	445	+41%	259	1.7×

- **Black Swan:** 1,532 authorised, double 2024 and nearly 11 times the average. Black Swan permits have climbed from 17 to 32 in a year.
- **Western Grey Kangaroo:** 16,419 animals under 65 permits – double 2024 with slightly fewer permits, meaning much larger numbers per permit (about 253 per permit).
- **Bare-nosed Wombat:** 407 permits for 4,321 wombats, up 61% on 2024. Wombat permits are typically small (about 11 animals each), so they are issued to many individual landholders.
- **Black (Swamp) Wallaby:** permits jumped from 103 to 184 and animals nearly doubled to 3,018.
- **Cape Barren Goose:** 1,606 authorised, almost four times the average, despite this once being one of the world's rarest geese.
- **Birds of urban and farm areas:** Rainbow Lorikeet (3,410, 3.1×), Pacific Black Duck (1,581, 3.3×) and Welcome Swallow (1,159, 3.5×) all rose sharply. Sulphur-crested Cockatoo more than doubled on 2024 (625 → 1,495) but remains below its long-run average.

Species below their long-run average

Some species that were heavily targeted in earlier years had fewer animals authorised in 2025.

Table 2.3. Species below their long-run average: animals authorised in 2025 compared with 2024 and the 2009–24 annual average.

Species	2024 animals	2025 animals	Change vs 2024	2009–24 avg / yr	2025 ÷ avg
Masked Lapwing	59	39	-34%	299	0.1×
Long-billed Corella	1,510	1,230	-19%	4,365	0.3×
Noisy Miner	0	115	n/a	376	0.3×
Galah	820	870	+6%	2,680	0.3×
Pied Currawong	185	228	+23%	475	0.5×
Sulphur-crested Cockatoo	625	1,495	+139%	2,695	0.6×
Australian Magpie	371	205	-45%	364	0.6×
Little Corella	6,805	2,245	-67%	3,490	0.6×
Red Kangaroo	11,146	3,869	-65%	5,894	0.7×
Red-necked Wallaby	315	420	+33%	602	0.7×

The biggest falls were for Red Kangaroo (11,146 → 3,869, down 65%) and Little Corella (6,805 → 2,245, down 67%). The two corellas and the Galah are now well below their long-run averages, which were driven by large permits in earlier years. These falls are small next to the rise in kangaroo and wombat numbers. A full species-by-species comparison is in the Appendix.

2.4 Top ten species

By number of animals targeted

Table 2.4. Top ten species by number of animals targeted, 2025.

Rank	Species	2025 animals	% of 2025 total	2025 permits
1	Eastern Grey Kangaroo	162,644	70.5%	3,327
2	Western Grey Kangaroo	16,419	7.1%	65
3	Silver Gull	9,170	4.0%	41
4	Maned Duck	4,488	1.9%	136
5	Bare-nosed Wombat	4,321	1.9%	407
6	Red Kangaroo	3,869	1.7%	14
7	Rainbow Lorikeet	3,410	1.5%	28
8	Australian Raven	3,018	1.3%	81
9	Black Wallaby	3,018	1.3%	184
10	Little Corella	2,245	1.0%	34

Table 2.5. Top ten species by number of animals targeted, all years 2009–2025.

Rank	Species	Animals 2009–2025	% of all animals	Permits 2009–2025
1	Eastern Grey Kangaroo	1,517,018	61.8%	33,244
2	Silver Gull	132,202	5.4%	407
3	Western Grey Kangaroo	113,263	4.6%	1,079
4	Red Kangaroo	98,174	4.0%	183
5	Long-billed Corella	71,063	2.9%	590
6	Maned Duck	58,658	2.4%	1,821
7	Little Corella	58,080	2.4%	564
8	Sulphur-crested Cockatoo	44,615	1.8%	800
9	Bare-nosed Wombat	44,104	1.8%	3,941
10	Galah	43,744	1.8%	611

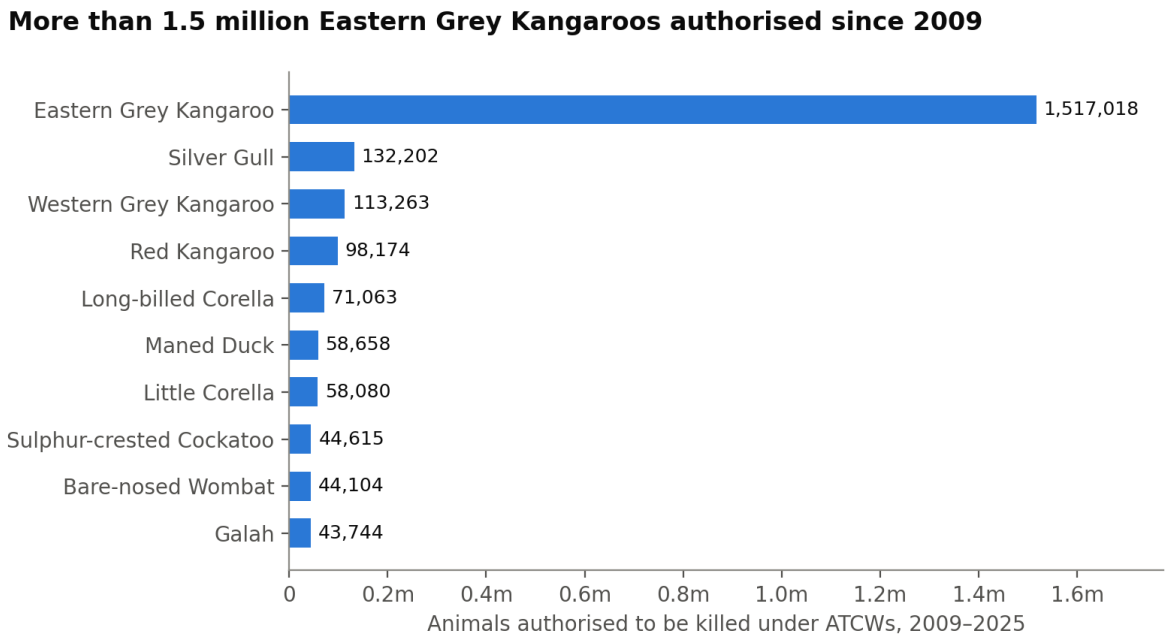


Figure 2.4. The ten species with the most animals authorised for killing, 2009–2025.

Eastern Grey Kangaroo is first by a very wide margin: 1,517,018 animals since 2009, 61.8% of the total. Silver Gull is second overall (132,202). Three cockatoo and corella species (Long-billed Corella, Little Corella and Sulphur-crested Cockatoo) and the Galah are in the all-years top ten.

By number of permits issued

Table 2.6. Top ten species by number of permits issued, 2025.

Rank	Species	2025 permits	% of 2025 permits	2025 animals
1	Eastern Grey Kangaroo	3,327	69.2%	162,644
2	Bare-nosed Wombat	407	8.5%	4,321
3	Black Wallaby	184	3.8%	3,018
4	Maned Duck	136	2.8%	4,488
5	Australian Raven	81	1.7%	3,018
6	Western Grey Kangaroo	65	1.4%	16,419
7	Emu	59	1.2%	919
8	Pacific Black Duck	50	1.0%	1,581
9	Silver Gull	41	0.9%	9,170
10	Little Corella	34	0.7%	2,245

Table 2.7. Top ten species by number of permits issued, all years 2009–2025.

Rank	Species	Permits 2009–2025	% of all permits	Animals 2009–2025
1	Eastern Grey Kangaroo	33,244	62.2%	1,517,018
2	Bare-nosed Wombat	3,941	7.4%	44,104
3	Black Wallaby	2,175	4.1%	28,422
4	Maned Duck	1,821	3.4%	58,658
5	Australian Raven	1,433	2.7%	42,677
6	Western Grey Kangaroo	1,079	2.0%	113,263
7	Emu	1,070	2.0%	14,936
8	Sulphur-crested Cockatoo	800	1.5%	44,615
9	Galah	611	1.1%	43,744
10	Long-billed Corella	590	1.1%	71,063

Ranking by permits shows how widely a species is targeted. Eastern Grey Kangaroo permits (3,327 in 2025) are 69.2% of all permits. Bare-nosed Wombat is second in both lists, ahead of species with far more animals authorised – wombat permits are many but small. Silver Gull ranks third for animals but only ninth for permits, because a few permits cover thousands of birds.

2.5 The killing of koalas in Victoria

Koalas do not appear in the ATCW table. This is not because they are not being killed. Koala killing in Victoria has been carried out by the department itself, under its own programs, outside the permit system. It is therefore missing from the main public record of wildlife control and has often come to light only after the event. The total number of koalas killed since 2013 is likely to total 5,000 to 6,000 animals, perhaps more.

Table 2.8. Documented koala deaths from government programs in Victoria.

When	Where	Method	Koalas killed	How it became public
2013–2014	Cape Otway	Captured, sedated and euthanised	686	Not announced. Disclosed by Environment Minister Lisa Neville in March 2015.
2015–2018	Cape Otway	Euthanised during health checks	193	Listed in the department's Cape Otway timeline.
May and Dec 2022	Budj Bim	Euthanised during health checks	58 (30 + 28)	Department web page and media.
Mar/Apr – 25 Apr 2025	Budj Bim National Park	Shot by marksmen from helicopters	About 700 (government, mid-April) to more than 1,000 (later reports)	Not announced. First reported after a tip-off to journalists.
Total documented in the 4 events listed above			**about 1,640 – 1,940**	

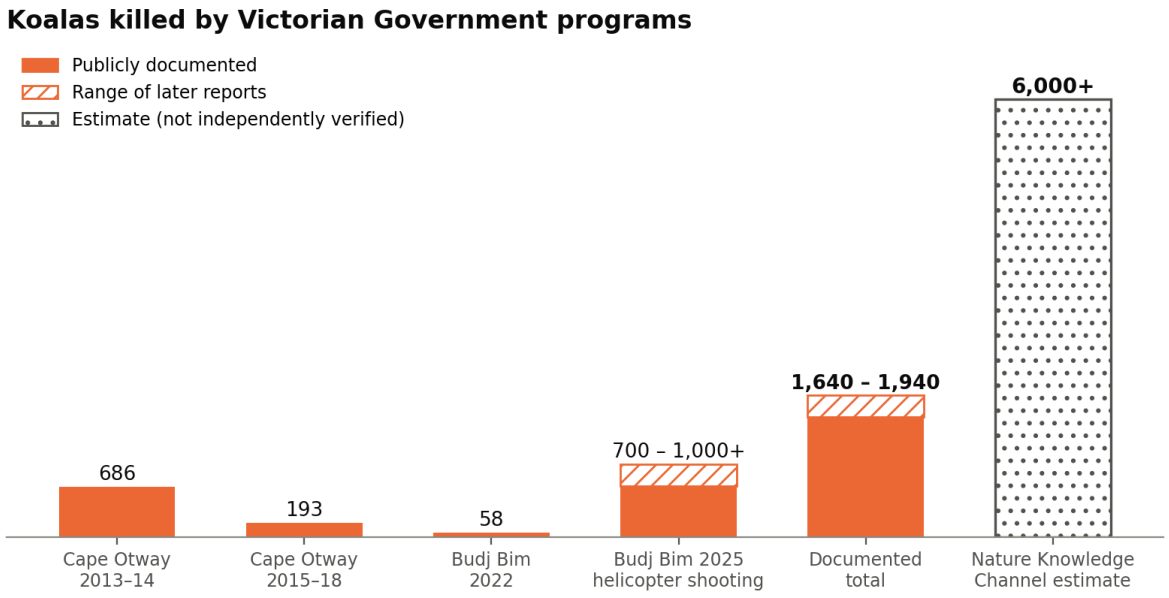


Figure 2.5. Documented koala deaths from government programs, compared with the Nature Knowledge Channel estimate. Hatched areas show the range between early and later reported figures.

Cape Otway, 2013–2014

In 2013 and 2014, 686 koalas at Cape Otway were captured, sedated and killed by departmental staff. The government did not tell the public. The killings were disclosed only in March 2015 by the incoming Environment Minister, Lisa Neville, who said the government would be more transparent in future. A further 193 koalas were euthanised at Cape Otway between 2015 and 2018 during health checks, alongside fertility control and relocation of healthy animals.

Budj Bim National Park, 2025: shooting from helicopters

A bushfire burned about 2,200 hectares of Budj Bim National Park in south-west Victoria from 10 March 2025. Instead of treating injured and starving koalas on the ground, DEECA used marksmen in helicopters to shoot koalas from the air.

The shooting was not announced. It became public only after a tip-off to journalists, while it was already under way. It ended on or about 25 April 2025.

- Reported numbers rose over time: about 700 koalas by mid-April (the government's figure), then more than 1,000 in later reports. About 2,200 koalas were assessed, and nearly half were shot.
- Reports say almost 90% of koalas shot were not examined on the ground first. Many bodies were never recovered, so it is not known how many carried joeys that were left to die.
- Budj Bim is a UNESCO World Heritage area. The koalas were surrounded by blue-gum plantations. In 2022 the department had already euthanised 58 koalas there during health checks.
- The government said the action was humane and necessary to end the suffering of burnt and starving koalas, and that experienced vets approved it. Critics – including koala groups, scientists and vets – say an animal's condition cannot be judged from a helicopter, and that shooting from the air is not a humane form of euthanasia. The Nature Knowledge Channel made several visits to Budj Bim during that period and extensive documentation and investigations did not locate a single dead koala, the assumption being that the dead koalas were collected and disposed of in a secret location.

- Australians for Animals took DEECA to the Victorian Supreme Court in June 2025, seeking an injunction to stop further aerial shooting. In September 2025 DEECA sought orders to suppress the identities of the vets and others involved, and argued the group had no standing to bring the case.

Were there two or more aerial shooting operations?

There is good reason to believe that koalas were shot from helicopters on at least two separate occasions. Reports give different starting points for the shooting – from mid-March to early April 2025 – and the published toll jumped from about 700 to over 1,000. This is consistent with more than one round of shooting. At the time, reporters also noted that Budj Bim "may not have been the first time" this method had been used.

However, the public record so far confirms only the Budj Bim operation of March–April 2025 in detail. The department has released little information, despite Freedom of Information requests and questions in Parliament. Confirming any further operation would need access to departmental records, for example through Freedom of Information or the Supreme Court case. In 2024 the Nature Knowledge were informed that the Victorian Government had been shooting koalas from a helicopter in Western Victoria but this could not be verified.

How many koalas has the government killed?

Adding up only the figures that have been made public gives about 1,640 to 1,940 koalas killed by government programs since 2013. The Nature Knowledge Channel estimates that at least 6,000 koalas have been killed in Victoria by its government.

The gap between the two numbers reflects how much is not disclosed. Koala killings do not appear in the ATCW figures, operations have been revealed only after the fact, the aerial toll was never confirmed by body counts, and numbers from other programs and years have not been published. Until the government publishes a full account, the true number cannot be checked, and the documented total should be treated as a minimum.

2.6 Conclusions

- ATCW killing in Victoria is rising fast: 2025 authorised 230,673 animals, 66% above the long-run average, with no checks on what actually happens after a permit is issued.
- The system is overwhelmingly used against kangaroos, but authorisations for wombats, wallabies, Black Swans, geese, ducks and lorikeets are also climbing well above past levels.
- Koalas – listed as endangered in Queensland, New South Wales and the ACT – are being killed by the government outside the ATCW system, including by shooting from helicopters, with little or no public disclosure.
- Better public reporting is needed: actual kills (not just authorisations), where and why permits are issued, and a full record of every government koala operation.

Appendix: 2025 compared with 2024 and the 2009–24 average, all species

Table 2.9. 2025 compared with 2024 and the 2009–24 average, all species.

Species	2025 permits	2025 animals	2024 permits	2024 animals	Avg permits / yr 2009–24	Avg animals / yr 2009–24	Animals: 2025 vs 2024	Animals: 2025 ÷ avg
Australasian Gannet	2	80	1	200	0.3	28	-60%	2.9×
Australian Fur Seal					7.2	21		
Australian Kestrel					0.3	1		
Australian King-parrot	1	10	1	10	0.2	1	0%	8.0×
Australian Magpie	17	205	10	371	19.7	364	-45%	0.6×
Australian Magpie Lark			2	2	4.4	40	-100%	
Australian Raven	81	3,018	67	2,539	84.5	2,479	+19%	1.2×
Australian Shelduck	20	1,120	21	688	13.2	565	+63%	2.0×
Australian White Ibis	7	305	8	520	5.8	404	-41%	0.8×
Banded Lapwing					0.1	6		
Bare-nosed Wombat	407	4,321	330	2,692	220.9	2,486	+61%	1.7×
Bell Miner	3	300			0.8	58	new	5.2×
Black Kite					0.9	16		
Black Swan	32	1,532	17	747	3.6	142	+105%	10.8×
Black Wallaby	184	3,018	103	1,570	124.4	1,588	+92%	1.9×
Black-faced Cuckoo-shrike	1	10			1.6	19	new	0.5×
Black-tailed Native Hen					0.6	15		
Brolga					0.1	3		
Brown Goshawk					0.1	1		
Brushtail Possum	14	424	12	216	6.1	166	+96%	2.6×
Cape Barren Goose	28	1,606	30	1,737	7.4	414	-8%	3.9×
Cattle Egret					0.1	3		
Chestnut Teal	1	50	3	130	1.3	53	-62%	0.9×
Crimson Rosella	24	747	23	767	18.0	638	-3%	1.2×
Dingo					0.9	8		
Dusky Moorhen					0.4	20		
Eastern Banjo Frog					0.1	1		

Species	2025 permits	2025 animals	2024 permits	2024 animals	Avg permits / yr 2009–24	Avg animals / yr 2009–24	Animals: 2025 vs 2024	Animals: 2025 ÷ avg
Eastern Brown Snake			1	3	2.1	26	-100%	
Eastern Grey Kangaroo	3,327	162,644	2,326	110,663	1,869.8	84,648	+47%	1.9×
Eastern Rosella	7	215	7	250	7.6	216	-14%	1.0×
Emu	59	919	51	886	63.2	876	+4%	1.0×
Eurasian Coot	1	15	5	285	2.6	141	-95%	0.1×
Fairy Martin			1	25	0.4	28	-100%	
Galah	13	870	8	820	37.4	2,680	+6%	0.3×
Great Cormorant	4	50	4	65	3.6	66	-23%	0.8×
Grey Butcherbird	1	3	1	1	1.6	16	+200%	0.2×
Grey Teal	16	390	20	564	5.9	369	-31%	1.1×
Hardhead					0.1	1		
Laughing Kookaburra	3	3	1	5	1.9	12	-40%	0.2×
Little Black Cormorant	3	45	5	70	3.6	54	-36%	0.8×
Little Corella	34	2,245	41	6,805	33.1	3,490	-67%	0.6×
Little Crow	2	15	4	400	0.6	31	-96%	0.5×
Little Lorikeet	1	100			0.1	1	new	160.0×
Little Pied Cormorant	4	45	5	70	3.8	48	-36%	0.9×
Little Raven	6	445	6	315	8.8	259	+41%	1.7×
Little Wattlebird	2	20	1	15	0.1	1	+33%	16.0×
Long-billed Corella	20	1,230	15	1,510	35.6	4,365	-19%	0.3×
Magpie Goose	1	40			0.1	94	new	0.4×
Mallee Ringneck			1	100	0.7	9	-100%	
Maned Duck	136	4,488	116	4,626	105.3	3,386	-3%	1.3×
Masked Lapwing	10	39	10	59	15.3	299	-34%	0.1×
Musk Lorikeet	16	1,310	19	1,770	24.4	1,557	-26%	0.8×
Noisy Friarbird	4	105	3	70	23.4	239	+50%	0.4×
Noisy Miner	12	115			9.0	376	new	0.3×
Pacific Black Duck	50	1,581	41	1,496	15.9	473	+6%	3.3×
Pacific Heron	1	10			0.1	0	new	80.0×
Pied Cormorant					0.1	0		
Pied Currawong	11	228	10	185	20.3	475	+23%	0.5×

Species	2025 permits	2025 animals	2024 permits	2024 animals	Avg permits / yr 2009–24	Avg animals / yr 2009–24	Animals: 2025 vs 2024	Animals: 2025 ÷ avg
Purple Swamphen	7	150	6	80	2.0	33	+88%	4.6×
Rainbow Lorikeet	28	3,410	24	2,365	18.6	1,116	+44%	3.1×
Red Kangaroo	14	3,869	25	11,146	10.6	5,894	-65%	0.7×
Red Wattlebird	10	335	5	215	10.7	342	+56%	1.0×
Red-necked Wallaby	17	420	13	315	18.3	602	+33%	0.7×
Richard’s Pipit					0.1	1		
Ringtail Possum	5	55	5	29	1.8	27	+90%	2.0×
Rufous Night Heron					0.5	4		
Satin Bowerbird	1	10	1	5	3.3	58	+100%	0.2×
Silver Gull	41	9,170	46	10,902	22.9	7,690	-16%	1.2×
Silvereye	9	220	8	220	12.3	311	0%	0.7×
Straw-necked Ibis			2	85	2.3	68	-100%	
Sulphur-crested Cockatoo	32	1,495	18	625	48.0	2,695	+139%	0.6×
Tammar Wallaby					0.2	2		
Welcome Swallow	7	1,159	4	353	4.9	335	+228%	3.5×
Western Grey Kangaroo	65	16,419	67	7,946	63.4	6,053	+107%	2.7×
White-faced Heron	4	45	3	30	1.5	17	+50%	2.7×
White-winged Chough			1	10	0.7	6	-100%	
Yellow Rosella					0.1	1		
Yellow-tailed Black-cockatoo					0.7	41		
Yellow-throated Miner					0.3	20		
TOTAL	**4,806**	**230,673**	**3,558**	**177,573**	**3,042**	**139,089**	**+30%**	**1.7×**

Averages = 2009–24 totals ÷ 16. “new” = none authorised in 2024. Blank = no animals authorised in the period.

ATCW figures: the supplied table “ATCW2026TABLE_master” (compiled from Victorian Government data by the Nature Knowledge Channel). The Nature Knowledge Channel estimate of 6,000 koalas is quoted as supplied and has not been independently verified.

CHAPTER 3

The Persecution of Kangaroos in Western Australia

A history from colonisation to 2026, with the parliamentary record on how Aboriginal people were considered

Prepared for	Peter Hylands
Date	October 2026
Background	*Persecution of Kangaroos in Western Australia: A history* and *Plausibility test of published kangaroo population estimates, 1980–2026* (Hylands, October 2026).

Executive summary

Kangaroos in Western Australia have been killed at commercial scale for more than 180 years, and for most of that time the law treated them first as a commodity and then as vermin. Aboriginal people, for whom the kangaroo was a staple food and a source of clothing, appear in the colonial record mainly as an exemption clause or as an argument about whether they still mattered.

- **The colonial government knew the stakes.** The 1853 Kangaroo Ordinance stated in its preamble that outside hunting was "calculated not only to deprive the aboriginal natives of their natural means of support" but also to cause "serious quarrels". It was repealed in 1878.
- **Early Hansard is explicit.** In the Legislative Council on 20 December 1870, the case for destroying kangaroos rested on the claim that "the natives had so decreased" that the animals were no longer needed, and that kangaroos "ate up the natural grass from sheep and cattle". The Member for York, John Monger, replied that "to the eastward of York the natives lived upon them".
- **Aboriginal interests were recognised only as exemptions.** The Game Act 1874 exempted Aboriginal people killing native game for subsistence, but kangaroos were not listed as native game until 1892. The exemption protected nothing while the skin trade ran unregulated.
- **The killing was on a large scale.** In the Legislative Assembly on 15 December 1891, F. H. Piesse said about "a million and a half of kangaroos" had been destroyed in the southern districts since 1887, "a general slaughter for the last four or five years".
- **From 1918 to 1970 the Vermin Act set the approach**, and destruction was often a legal duty. By 1967–1970, about 1.03 million red kangaroos went through local dealers in four years, against an estimated 1970 population of about 1.25 million.
- **The modern decline is steep.** Published estimates for WA's commercial species fell from 4.25 million (2019) to 1.30 million (2025). The red kangaroo take fell below 20,000 in 2022, under 10% of quota, and Perth's main pet-food processor closed in 2016 citing declining numbers.

- **Aboriginal people remain outside the decision.** Customary hunting is protected as a defence in wildlife law, but the commercial harvest plans and quota process are not built around Aboriginal food security or Traditional Owner governance.

3.1 Scope and sources

This report traces the persecution of kangaroos in Western Australia (WA) from 1829 to 2026. It gives particular attention to the question of how Aboriginal people were considered when the killing of a key food source began at scale.

It draws on the two background papers supplied, on R. I. T. Prince's 1984 review of kangaroo exploitation in WA to 1970 (which quotes the colonial ordinances and parliamentary debates), on WA statutes, and on later government and academic sources listed in the References.

A note on Hansard. The 20 December 1870 Legislative Council extract is taken from the background paper. The 1891 and 1907 debate extracts are quoted as reproduced by Prince (1984). The original Hansard PDFs on the Parliament of Western Australia website could not be retrieved while this report was prepared, so each quotation should be checked against the original volume before publication. Walter Padbury, named in the 1870 extract, did not take a Council seat until December 1872; the reference is presumably to his known views as a leading pastoralist, and the date and context are worth confirming.

3.2 Kangaroos and Aboriginal people before colonisation

Kangaroos and wallabies were central to Aboriginal economies across WA long before 1829. Prince (1984) describes them as "of great importance in the lives of the Aboriginal people", and notes that the south-western tribes drew from them "a valuable food source" as well as skins for cloaks, which were common practice around King George Sound. The Noongar word *yongka* for the western grey kangaroo survives in place names and language programs today.

Aboriginal people also shaped kangaroo habitat. Systematic burning opened country and created pasture favoured by grazing macropods, and kangaroo populations were harvested on a sustainable basis for millennia (Boom et al. 2012). Prince notes that "the prior activities of Aboriginal people most probably had had a profound influence" on the composition of the flora and fauna the colonists found.

The first European explorers depended on the same knowledge. On John Forrest's 1869 expedition, kangaroos were killed "mostly by the Aboriginal members of the party" and eaten (Prince 1984). Kangaroos were documented in large scale abundance, including mobs up to 500 animals by early settlers and explorers.



Figure 3.1. Key laws and events, 1829–2026. Orange marks the three points at which the colonial legislature explicitly weighed Aboriginal dependence on kangaroos. Sources: Prince (1984); WA statutes; Hylands (2026).

3.3 Colonisation and the first killing at scale, 1829–1870

Settlers at the Swan River colony took what Prince calls "a strictly utilitarian view of kangaroos and wallabies, similar to that of the Aborigines". The difference lay in scale and purpose. Colonists hunted with dogs and guns for meat and sport, and from 1843 for an export trade in skins.

Exports began with 320 skins from Albany in 1843–44, passed 8,000 by 1847 and reached 29,506 in 1851 (Figure 3.2). This was in country where Aboriginal people were already losing access to water, hunting grounds and burning regimes as land was granted and stocked.

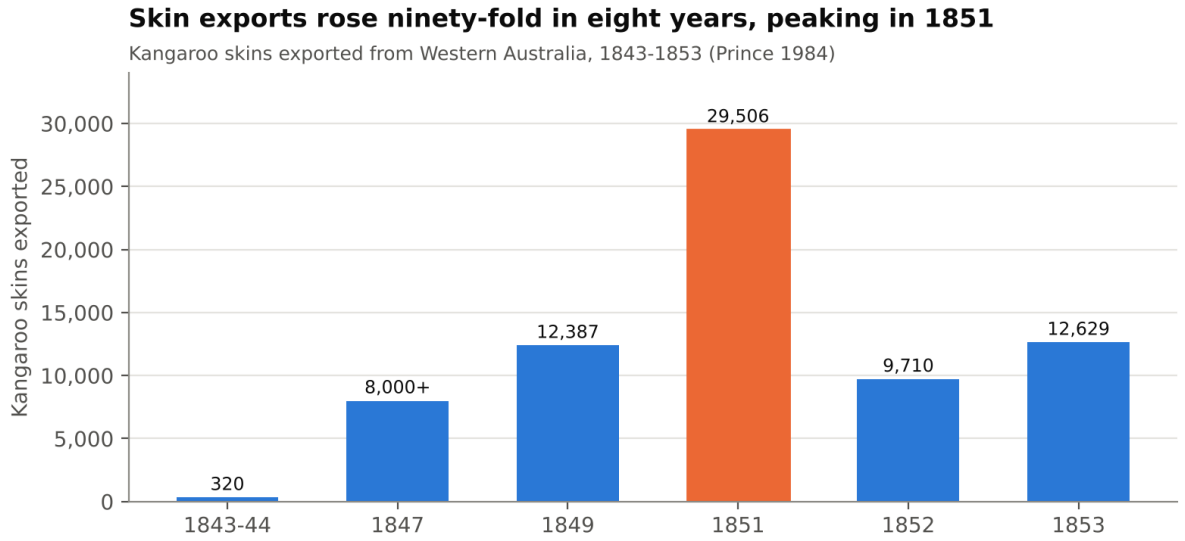


Figure 3.2. Kangaroo skins exported from WA, 1843–1853. Source: Prince (1984), from colonial Blue Books.

3.3.1 The Kangaroo Ordinance 1853

The colonial Legislative Council's response was the Kangaroo Ordinance 1853 (16 Vict. No. 14), "An Ordinance to provide for the issue of Licenses to kill Kangaroos", assented on 13 April 1853. Its preamble is the clearest statement in WA law that the colonial government understood what commercial hunting meant for Aboriginal people. Hunting by outsiders was:

> *calculated not only to deprive the aboriginal natives of their natural means of support, without affording them in return any of the facilities for obtaining employment and food which they enjoy in the settled districts … [but leading to] serious quarrels between such hunters and the Aborigines.*
>
> — Preamble, Kangaroo Ordinance 1853, as quoted in Prince (1984)

Three features of the Ordinance matter for this report.

1. **Protection was framed as order, not right.** The preamble balances the loss of Aboriginal food against the "facilities for obtaining employment and food" in the settled districts. In other words, the replacement for kangaroo was dependence on settlers, and the concern was conflict on the frontier.
2. **The exemptions favoured landholders.** Licences were not required of "owners, legal occupiers, or lessees of any country land, or their servants, (and) the aboriginal natives". The people whose stock displaced kangaroos were free to kill them.
3. **It did not last.** Exports dropped sharply after 1853, and Prince judges the measure more punitive towards the outside trade than protective of the animals. The colonial legislature repealed it in 1878 (42 Vict. No. 9).

3.4 Early Hansard: how Aboriginal people were considered, 1870–1912

The colony's first partly elected Legislative Council sat from late 1870. Within weeks the destruction of kangaroos was being argued in terms that set Aboriginal survival against the interests of pastoralists.

3.4.1 The debate of 20 December 1870

> *The natives had so decreased that their destruction (Kangaroos) was necessary, as they ate up the natural grass from sheep and cattle. Mr. Monger said that it might suit Mr Padbury to have them destroyed, as there may not be many natives in his part of the country, but he could assure hon. members that to the eastward of York the natives lived upon them.*
>
> — Western Australian Legislative Council, Hansard, 20 December 1870 (as quoted in Hylands, background paper)

This short exchange shows how Aboriginal people were considered when killing at scale was proposed.

- **Aboriginal decline was used as the justification.** The argument for destruction did not deny that Aboriginal people depended on kangaroos. It claimed that there were now too few of them for that dependence to count. The fall in Aboriginal numbers since 1829, through disease, violence and dispossession, became a reason to remove their food.
- **Kangaroos were recast as competitors of stock.** The animals "ate up the natural grass from sheep and cattle". This is the economic logic that would later make kangaroos vermin.
- **The defence was local and conditional.** John Monger, Member for York from 1870 to 1875, did not argue that Aboriginal people had a right to the kangaroo. He argued that east of York they still lived on it, so destruction would harm them there. Aboriginal interests were weighed by district and by headcount.
- **Aboriginal people had no voice.** No Aboriginal person sat in, voted for or gave evidence to the Council. Their needs entered the record only when a settler member chose to raise them.

3.4.2 The Game Act 1874 and an empty exemption

The Game Act 1874 (38 Vict. No. 4) protected "imported Game" and, during the breeding season, "Native Game". It did not apply to "any aboriginal native or native of the half-blood of Australia killing or destroying native game" for their own subsistence (DBCA, history of duck-hunting regulation).

On its face this recognised Aboriginal subsistence hunting. But kangaroos were not listed as native game until 1892 (Prince 1984). For eighteen years the exemption protected nothing with respect to kangaroos, while the skin trade operated without a close season. When the Kangaroo Ordinance was repealed in 1878, the only law that had named Aboriginal people's "natural means of support" went with it.

3.4.3 "A general slaughter": the Game Bill of 1891–92

By the late 1880s the skin trade had revived on a far larger scale. Debating the Game Bill in the Legislative Assembly, F. H. Piesse, Member for Williams, put the destruction in the southern districts at about one and a half million kangaroos since May 1887:

> *… a million and a half of kangaroos … there has been a general slaughter for the last four or five years.*
>
> — F. H. Piesse MLA, Legislative Assembly, 15 December 1891 (as quoted in Prince 1984)

That implies up to about 300,000 a year. In 1892 the colony exported 402 bales of skins valued at £27,599, which Prince estimates at 135,000 to 235,000 animals. Premier John Forrest told the House in 1891 that "the time had arrived" to reserve parts of the colony for game, and the Game Act 1892 listed kangaroos as native game for the first time.

Aboriginal welfare was by then handled in a separate channel. The Aborigines Protection Act 1886 created a Protection Board, and section 70 of the 1889 Constitution required 1% of gross revenue to be paid to it. Settler politicians resented that clause as imposed from London, and the colonial parliament

removed it in 1897 (Curthoys and Lydon 2016). Food for Aboriginal people became a question of rations administered by a Board, not of game law. The kangaroo debates proceeded as if the two were unrelated.

3.4.4 Reserves, royalties and the same officials, 1899–1912

Kangaroo reserves were proclaimed from 1899, but enforcement was weak. Charles Gale, Chief Inspector of Fisheries, estimated that about 340,000 skins were exported between January 1901 and June 1902, roughly 253,000 of them from ports in the grey kangaroo reserve (Prince 1984). In the Legislative Council in 1907, J. M. Drew reported:

> *… last year (1906) 80 000 skins were exported from Geraldton alone, and in the previous year (1905) 40 000 skins.*
>
> — J. M. Drew MLC, Game Act Amendment debate, December 1907 (as quoted in Prince 1984)

The 1905 Royal Commission led by Dr W. E. Roth reported that Aboriginal people lived in poor conditions and recommended that "large hunting grounds be reserved for the sole use of Aboriginal people" and that excessive "land-grabbing" be curtailed. The Aborigines Act 1905 that followed concentrated on control rather than land or food.

After the 1908 amalgamation of departments, Gale, the official who had reported on the scale of the skin trade, also became Chief Protector of Aborigines. Knowledge of the kangaroo trade and responsibility for Aboriginal welfare thus rested with one officer, yet the sources reviewed show no attempt to connect the collapse of game with Aboriginal hunger.

The Game Act 1912 added royalties on marsupial skins, chiefly for revenue, and licences to take kangaroos for food (Prince 1984).

3.4.5 The pastoral lease reservation

One colonial protection has survived. WA pastoral leases have long carried a reservation allowing Aboriginal people to enter unenclosed and unimproved land to seek their sustenance in their accustomed manner, now in section 104 of the Land Administration Act 1997. The High Court in *Western Australia v Ward* (2002) held that the native title right to hunt or gather traditional food is not inconsistent with a pastoral lease. The reservation shrinks as land is fenced and improved, which is the same process that displaced kangaroos.

Table 3.1. How Aboriginal people appear in WA kangaroo and game law, 1853–2016

Year	Law or debate	What it said about Aboriginal people	Practical effect
1853	Kangaroo Ordinance	Outside hunting would "deprive the aboriginal natives of their natural means of support"; Aboriginal people exempt from licences	Landholders also exempt; repealed 1878
1870	Legislative Council debate	Kangaroos could be destroyed because "the natives had so decreased"; Monger: east of York "the natives lived upon them"	Aboriginal need weighed by district and headcount
1874	Game Act	Aboriginal subsistence killing of native game exempt	Kangaroos not native game until 1892
1886–89	Aborigines Protection Act; Constitution s.70	Welfare by Board and rations; 1% of revenue	s.70 removed 1897; food separated from game law
1905	Roth Royal Commission	Recommended large hunting grounds for Aboriginal use	Not acted on in the 1905 Act
1918–1970	Vermin Act era	None identified in the sources reviewed	Kangaroos destroyed as pests
1950–2016	Fauna Protection / Wildlife Conservation Acts	Defence for taking fauna for Aboriginal customary purposes, not for sale	Personal use only; no role in the harvest
2016–	Biodiversity Conservation Act; harvest plans	Customary-purpose provisions continue	Harvest plans make no provision for Traditional Owner governance

3.5 Vermin, pest control and the pet-meat trade, 1918–1970

As wheat farming spread into kangaroo habitat from about 1905, kangaroos came to be treated as agricultural pests. The Vermin Act 1918, Prince writes, "had a major effect on the general approach to exploitation of kangaroos and wallabies" from about 1920 to 1970. In many areas their destruction became a legal requirement (McNamara 1986). Much of this killing was never recorded.

The Fauna Protection Act 1950 came into force on 1 July 1952 and nominally protected all fauna, but the Vermin Act prevailed where the two conflicted. The new Act did allow licensed hunters to take one kangaroo a week for food (Boom et al. 2012). After 1934, about 1.25 million red kangaroo skins were traded from WA into the Sydney market.

By the mid-1950s the dried-skin trade had collapsed, and the industry turned to pet meat, with skins discarded until new treatment methods revived their value by 1969 (Hylands, background paper). Attempts to build a human-consumption market failed on hygiene grounds.

The late 1960s brought what the background paper calls "a frenzy of killing". Local dealer records show 175,000 red kangaroos in 1967, 175,000 in 1968, 400,000 in 1969 and 275,000 in 1970: about 1.03 million in four years, against an estimated population of 1.25 million on pastoral land in 1970 (CALM, c. 1985). In December 1969 the government's own marsupial research officer warned on ABC radio that habitat destruction was "the most important factor to be considered" for the western grey kangaroo.

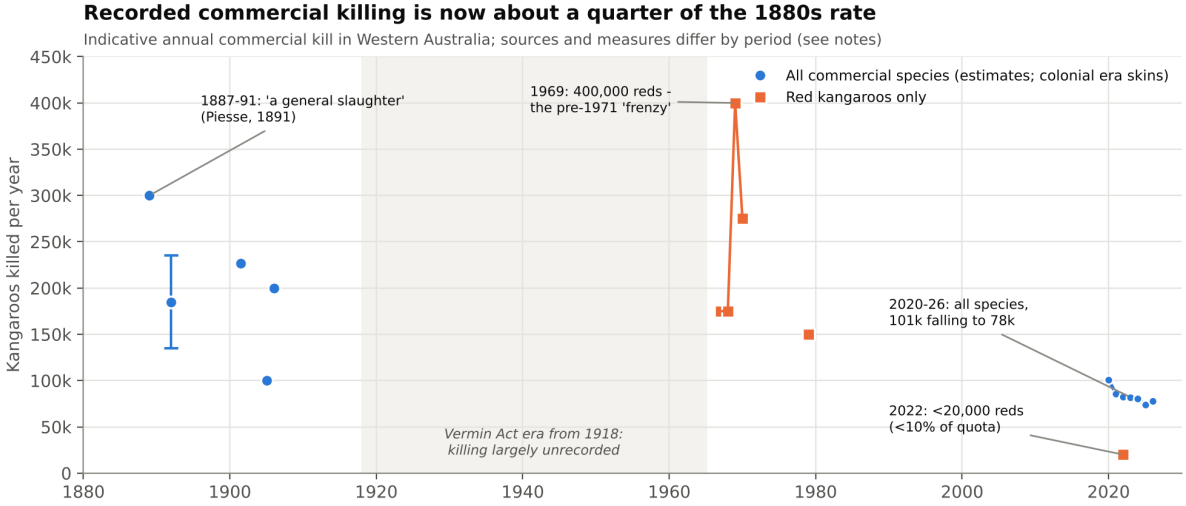


Figure 3.3. Indicative annual commercial kill in WA. Blue: all commercial species (1887–1906 from skin exports and contemporary estimates; 2020–2026 recorded take, 2025–26 estimated). Orange: red kangaroos only (dealer trade 1967–70; 1979 harvest; 2022 commercial take). The bracket shows the range of Prince's 1892 estimate. Sources: Prince (1984); CALM (c. 1985); Hylands (2026). Vermin-era destruction is not recorded and is not shown.

3.6 The managed harvest, 1971–2026

WA introduced its red kangaroo management program in 1971, prompted by fears that the killing would drive the species to extinction in the state. In the first year 57 shooters were licensed to take a quota of 225,000 red kangaroos. Over the 1970s the commercial take fell from a short-term average of 300,000 to 150,000 by 1979, and a rise in 1979 was "entirely due" to shooting more females, whose joeys went uncounted (Hylands, background paper).

In 1973 the United States banned kangaroo imports under its endangered-species law, and the Commonwealth banned exports of kangaroo products. By the mid-1980s the harvest was described officially as "the tool of management, aimed at keeping kangaroo numbers within limits tolerable to

landholders" (McNamara 1986). Boom et al. (2012) note that only WA still keeps damage mitigation as a stated goal of its harvest.

Current harvesting is governed by the Management Plan for the Commercial Harvest of Kangaroos in Western Australia 2024–28, which covers red and western grey kangaroos (DBCA).

3.6.1 What the numbers show

Published estimates for WA's commercial species have been volatile, but the recent fall is the steepest in the series: from 4.25 million in 2019 to 1.30 million in 2025, and 3.09 million to 1.30 million (–58%) since 2020 alone (Figure 3.4).

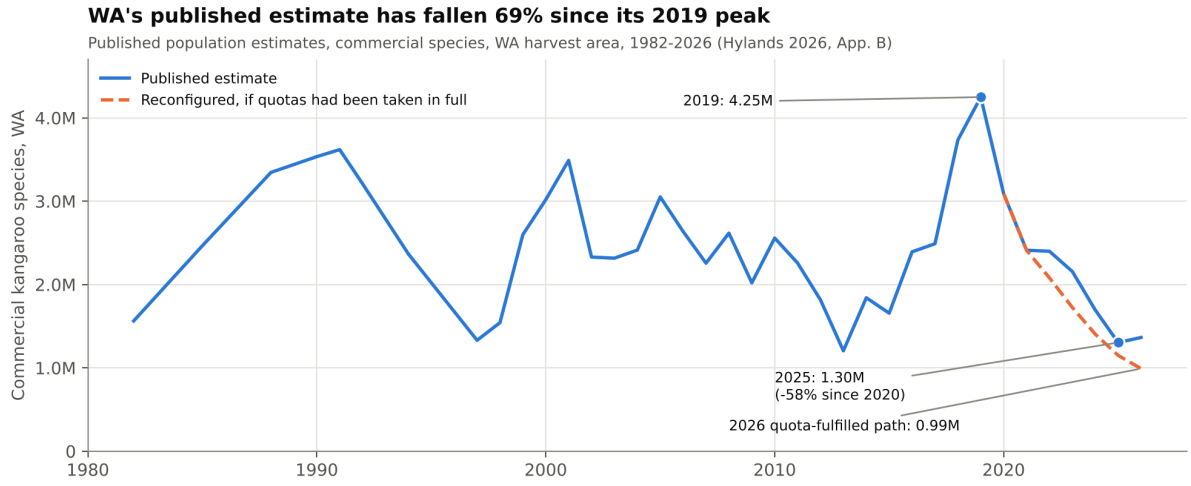


Figure 3.4. Published population estimates for WA's commercially harvested kangaroos, 1982–2026, and the reconfigured population if every quota since 2020 had been taken in full. Source: Hylands (2026), Appendices B and C.

Quotas have been cut by 61% since 2020, from 489,130 to 191,880, while the take has fallen more slowly, from 100,893 to an estimated 78,000. The share of quota used has therefore doubled to about 41% (Figure 3.5).

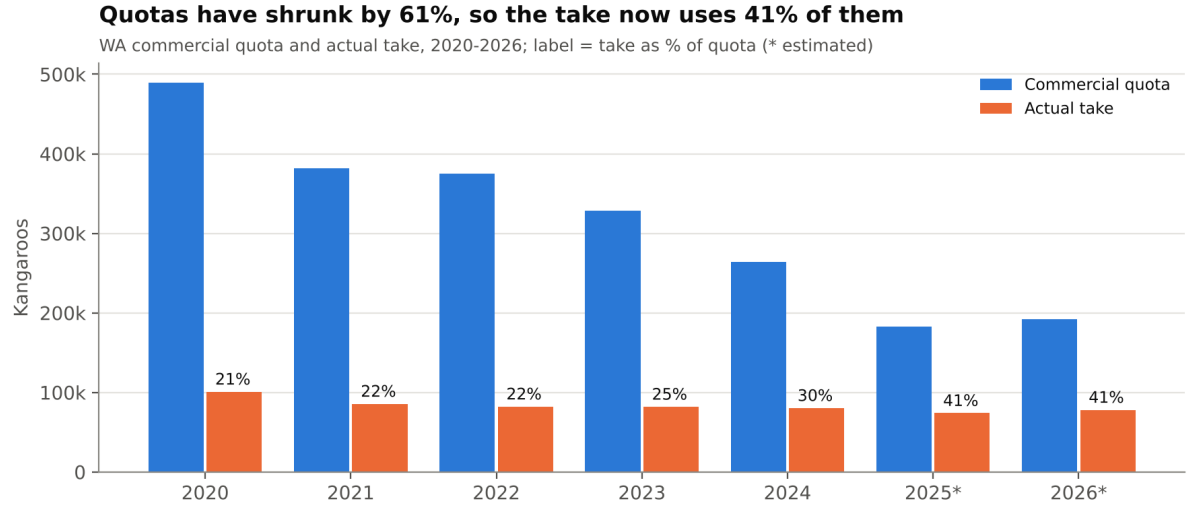


Figure 3.5. WA commercial quota and actual take, 2020–2026 (2025–26 estimated). Source: Hylands (2026), Appendix A.

The plausibility test in the background paper adds four findings specific to WA.

- **The decline is plausible; the 2026 rise is near the ceiling.** The 2020–2025 fall passes the test. The 2026 published figure of 1.36 million sits just above the 1.32 million that breeding could deliver.
- **WA is close to break-even.** At 10% annual growth, the population needed simply to replace the 2026 losses is 1.17 million. The published estimate is only 17% above it.
- **Had quotas been filled, WA would be below one million.** The quota-fulfilled path reaches 0.99 million in 2026.
- **Losses and take.** From 2020 to 2026, an estimated 174,889 joeys and 116,593 other deaths sat on top of the 582,964 kangaroos officially taken in WA.

The red kangaroo, the species whose near collapse created the 1971 program, is now taken in small numbers. In 2022 fewer than 20,000 were killed commercially, under 10% of the quota. In 2016 VIP Petfoods closed its Perth processing plant, citing declining kangaroo numbers and an under-used plant.

3.6.2 Aboriginal people in the modern regime

Modern wildlife law protects Aboriginal customary hunting as a defence. Section 23 of the Wildlife Conservation Act 1950 made it a defence to prove that fauna was taken by an Aboriginal person for an "Aboriginal customary purpose", including food, subject to landholder consent and a ban on sale; these customary-purpose provisions continue under the Biodiversity Conservation Act 2016.

This is the 1874 model in modern form: an exemption for personal use. The DBCA's description of the commercial program does not mention Traditional Owners, and the quota process is not designed around Aboriginal food security or the cultural standing of the kangaroo. In the arid red kangaroo range, the government's own 1980s review recorded that Aboriginal people still hunt for food "as they have in the past", especially near communities and outstations (CALM, c. 1985).

3.7 Continuities across 170 years

1. **Aboriginal interests counted only as a residual.** In 1853 they were a reason for licensing; in 1870 a reason that could be dismissed because "the natives had so decreased"; from 1874 onward an exemption. At no point were Aboriginal people decision-makers.
2. **The kangaroo as competitor of stock.** The 1870 complaint that kangaroos "ate up the natural grass from sheep and cattle" runs directly to the Vermin Act and to today's goal of damage mitigation.
3. **Law followed the killing.** The 1853 Ordinance followed the 1851 export peak; the 1892 Act followed the "general slaughter"; the 1971 program followed the 1969 "frenzy". Each time, regulation arrived after the damage.
4. **The counting has always been incomplete.** Vermin-era killing went largely unrecorded; joeys have never been counted; and, as the background paper shows, published population estimates often rise faster than breeding allows.
5. **Habitat loss compounds the harvest.** The 1969 warning that clearing was "the most important factor" for the grey kangaroo still applies, and it removes the same unenclosed land on which the Aboriginal pastoral reservation depends.

3.8 Conclusions and further research

The early parliamentary record answers the question of how Aboriginal people were considered. The colonial government recognised in 1853 that commercial hunting would take away Aboriginal people's "natural means of support". By 1870 the decline of Aboriginal people was itself offered as grounds for

destroying the kangaroo. Thereafter, Aboriginal dependence was acknowledged only through exemptions that protected little, while the killing ran at hundreds of thousands a year.

The modern commercial take is smaller, but it now operates on a population that published estimates put at less than a third of its 2019 level and close to the point where losses exceed what breeding can replace. The pattern of 1870, in which commercial and pastoral interests define the problem and Aboriginal interests are an afterthought, has not been broken.

Further research that would strengthen this account:

- Obtain the full 20 December 1870 Council debate, confirm the bill or motion under discussion, and establish Padbury's role.
- Search the 1891–92 Game Bill and 1907 and 1912 Game Act debates for further references to Aboriginal people.
- Examine the Aborigines Department and Aborigines and Fisheries Department files (State Records Office) for links between game decline and ration demand.
- Record Noongar, Yamatji and Wongi accounts of kangaroo decline and its effect on food and culture.

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CHAPTER 4

Queensland: The Commercial and Damage Mitigation Killing of Kangaroos

Red Kangaroo, Eastern Grey Kangaroo and Wallaroo: quotas, actual take and population estimates across all five commercial harvest zones, 2014 to 2026, and Queensland's place in the national commercial kill since 1980

Author	Peter Hylands
Report date	19 October 2026
Data currency	commercial take to 7 October 2026; damage mitigation permits to 28 July 2026; annual species series 2014 to 2025 (2025 commercial take now the Queensland Government actual); national series 1980 to 2026.
Coverage	Queensland, commercial harvest zones 1 to 5; all-Australia mainland commercial zones for the national comparison.

Key findings

- **2026 to date:** 504,071 animals were taken commercially in Queensland to 7 October 2026, and damage mitigation permits (DMPs) covering 40,462 animals were issued to 28 July, a combined 544,533 animals before any allowance for joeys.
- **2025 actual take:** Queensland Government figures for 2025 record 609,842 animals taken commercially: 286,939 Eastern Grey Kangaroos, 265,271 Red Kangaroos and 57,632 Wallaroos, 20.7% of the 2025 commercial quota.
- **Take is always well below quota.** Across 2014 to 2025, commercial take reached 8,875,869 animals against combined quotas of 36,760,150 (24.1%). No species reached 40% of its commercial quota in any year.
- **Queensland holds about half of Australia's commercially exploited kangaroos.** Queensland's share of the national population estimate has ranged from 30.5% (1991) to 65.6% (2002). It has been at or above 40% in every year since 1999 except 2022, and stands at 52.4% for 2026.
- **The national kill is now small against Queensland's estimate.** In 2025 all of Australia took 1,522,185 kangaroos commercially, equal to just 7.6% of Queensland's population estimate alone, against 32.7% in 1996. The national quota has remained at about a quarter to a third of the Queensland estimate.
- **Joeys:** Applying the Nature Knowledge Channel ratios, about 3.7 million joeys died in Queensland alongside the adults taken commercially and under DMPs in 2014 to 2025. Nationally, the estimate is about 26.5 million joeys since 1980.

- **Wallaroos remain the species of greatest concern.** Wallaroo population estimates fell by 72%, from 6,449,750 in 2014 to 1,809,250 in 2025, and the 2025 survey figure used to set 2026 quotas is lower again, at 1,182,634. Wallaroo commercial take to 7 October 2026 is already 35.6% of quota, the highest rate in the series.

4.1 Introduction and scope

This chapter analyses the killing of three commercially exploited macropod species in Queensland: the Red Kangaroo (Osphranter rufus), the Eastern Grey Kangaroo (Macropus giganteus) and the Wallaroo (Osphranter robustus). These species are still being killed in very large numbers for commercial gain and for what is described as damage mitigation, despite evident exaggeration of kangaroo population estimates. The analysis covers all five commercial harvest zones and two forms of take:

- **Commercial harvest:** each animal is tagged, so commercial take figures are recorded counts. The number of joeys killed is not recorded and is estimated in Section 4.8.
- **Damage mitigation permits (DMPs):** the number of animals actually killed under DMPs is not tracked. Figures here are the numbers of animals authorised by the permits issued. Demand for permits is nonetheless an indicator of population increase or decline in a zone.

The annual species series runs from 2014 to 2025. Section 4.3 sets Queensland against the national commercial kill, quota and population estimates from 1980, and Section 4.8 considers joeys. Section 4.10 records the checks made on every table.

4.1.1 Queensland Government position on DMPs

The Queensland Macropod Management Program Annual Report 2024 states:

> *"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 per cent of the estimated population for each species. The number of macropods killed under DMP's, on average, remained below 25 per cent of the allowable DMP take."*

The 2025 Annual Report states that DMP take averaged 12% of the allowable limit in 2025. The 2026 DMP quotas are again set at 2% of the estimated population of each species in each zone.

4.2 2026 to date

The 2026 figures cover commercial take to 7 October 2026 (about 77% of the year) and DMPs issued to 28 July 2026 (about 57% of the year). They are partial-year totals.

4.2.1 Totals by zone and species

Table 4.1. Commercial take by zone, 2026 (to 7 October)

Zone	Red Kangaroo	Eastern Grey Kangaroo	Wallaroo	Total
Zone 1	16,117	0	769	16,886
Zone 2	98,242	19,881	32,913	151,036
Zone 3	56,084	22,607	12,325	91,016
Zone 4	31,469	147,133	4,540	183,142
Zone 5	2,132	54,979	4,880	61,991
Total	**204,044**	**244,600**	**55,427**	**504,071**

Table 4.2. Damage mitigation permits issued by zone, 2026 (to 28 July), number of animals

Zone	Red Kangaroo	Eastern Grey Kangaroo	Wallaroo	Total
Zone 1	0	0	0	0
Zone 2	6,030	2,730	1,830	10,590
Zone 3	2,500	1,800	500	4,800
Zone 4	2,980	12,590	130	15,700
Zone 5	200	7,762	1,410	9,372
Total	**11,710**	**24,882**	**3,870**	**40,462**

Table 4.3. Combined 2026 total to date by species

Species	Commercial take (to 7 Oct)	DMP permits issued (to 28 Jul)	Combined
Red Kangaroo	204,044	11,710	215,754
Eastern Grey Kangaroo	244,600	24,882	269,482
Wallaroo	55,427	3,870	59,297
Combined total	**504,071**	**40,462**	**544,533**

Note: DMP figures are animals authorised by permits issued; the actual number killed under DMPs is not tracked.

Commercial take in 2026 is concentrated in a small number of zones. Zone 4 accounts for 183,142 animals (36% of the total), mostly Eastern Grey Kangaroos, and Zone 2 for 151,036 (30%), mostly Red Kangaroos. Zone 1 recorded no Eastern Grey Kangaroo take and no DMPs for any species.

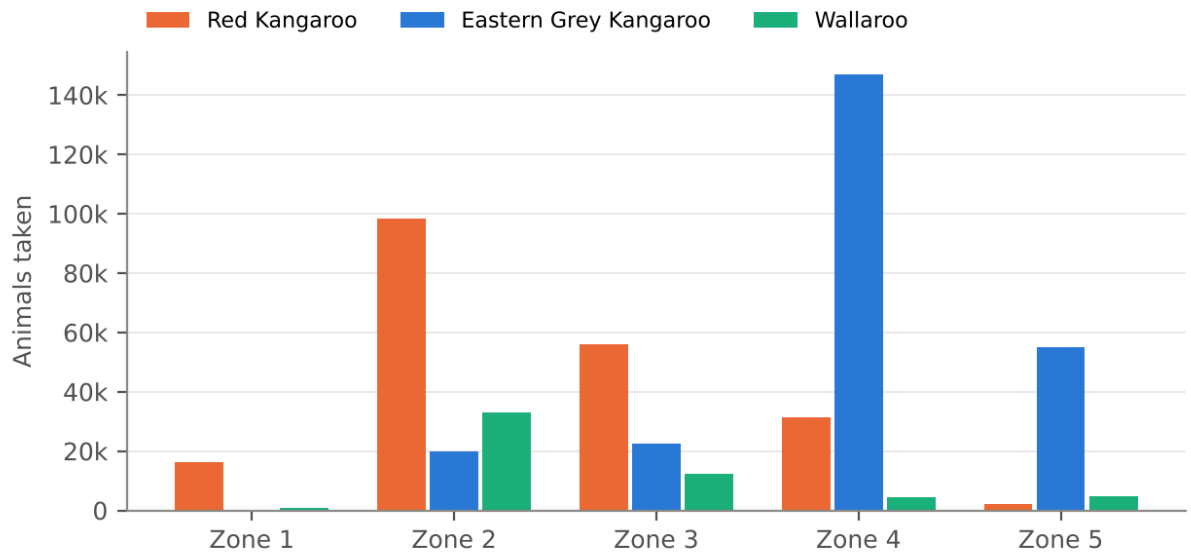


Figure 4.1. Commercial take by zone and species, 2026 to 7 October.

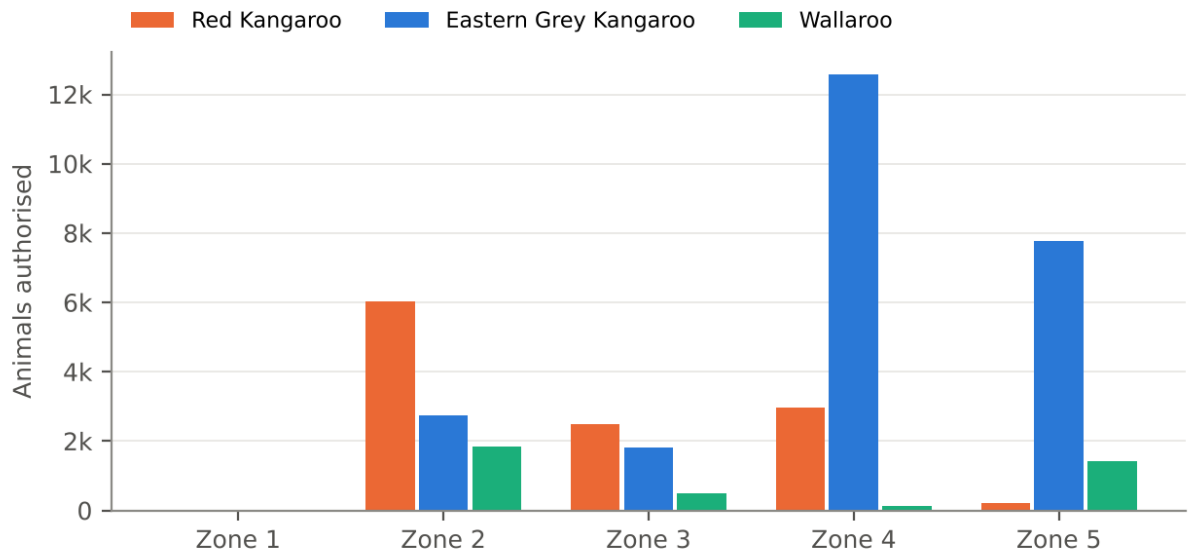


Figure 4.2. DMP permits issued by zone and species, 2026 to 28 July.

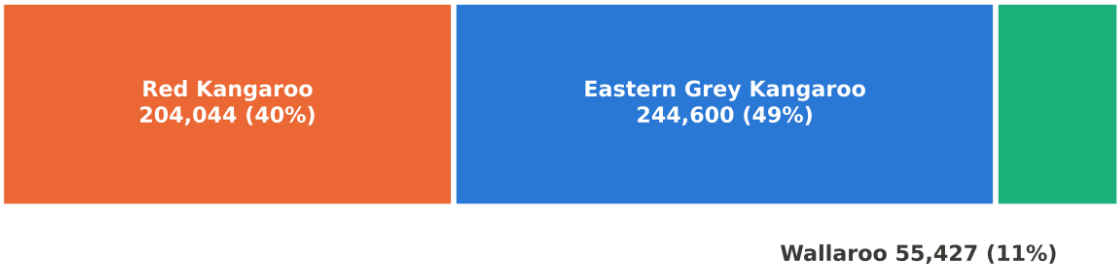


Figure 4.3. Share of 2026 commercial take by species, to 7 October.

4.2.2 Progress against 2026 quotas

The Queensland Government's 2026 Quota Submission sets a combined commercial quota of 2,850,900 animals and DMP quotas of 2% of each species' estimated population, a total of 386,164. Both are based on the 2025 population survey, which put the three species at 19,308,148 in the harvest zones.

Table 4.4. 2026 take to date against 2026 quotas

Species	2026 comm. quota	Comm. take to 7 Oct	% of quota	2026 DMP quota	DMP issued to 28 Jul	% of DMP quota
Red Kangaroo	1,301,000	204,044	15.7%	139,127	11,710	8.4%
Eastern Grey Kangaroo	1,394,250	244,600	17.5%	223,384	24,882	11.1%
Wallaroo	155,650	55,427	35.6%	23,653	3,870	16.4%
Total	**2,850,900**	**504,071**	**17.7%**	**386,164**	**40,462**	**10.5%**

Source for quotas: Queensland Government, 2026 Quota Submission, Queensland Macropod Management Program.

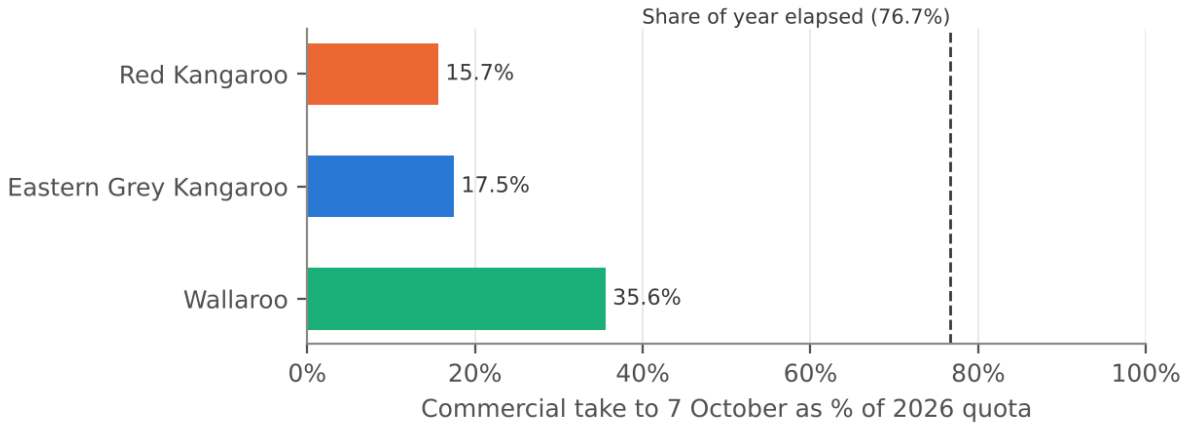


Figure 4.4. 2026 commercial take to 7 October as a share of the 2026 quota, against the share of the year elapsed.

Table 4.5. 2026 commercial take to 7 October as a share of zone quota

Species	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Red Kangaroo	21.5%	13.2%	15.9%	27.4%	13.8%
Eastern Grey Kangaroo	No quota	44.9%	30.5%	18.3%	11.6%
Wallaroo	6.3%	36.7%	74.9%	76.3%	15.6%

Note: the Eastern Grey Kangaroo quota in Zone 2 has been halved because the population estimate is below the low-population trigger point. There is no Eastern Grey Kangaroo quota in Zone 1.

With 77% of the year elapsed, commercial take of Red and Eastern Grey Kangaroos stands at 15.7% and 17.5% of quota, in line with the shortfall of earlier years. Wallaroo take, at 35.6% of quota, is running at about double that rate. At zone level, Wallaroo take has reached 74.9% of the quota in Zone 3 and 76.3% in Zone 4, and Eastern Grey Kangaroo take has reached 44.9% of the reduced Zone 2 quota.

If the pace to 7 October continued for the rest of the year, indicative full-year totals would be about 266,000 Red Kangaroos, 319,000 Eastern Grey Kangaroos and 72,000 Wallaroos, about 657,000 in all. This is a simple pro-rata projection, not a forecast. On that basis, the 2026 Eastern Grey Kangaroo take would be the highest since 2019, and the Wallaroo take the highest since 2022.

4.2.3 Females taken in 2026

Table 4.6. Commercial take by sex, 2026 to 7 October

Species	Total taken	Males	Females	Females %
Red Kangaroo	204,044	181,112	22,932	11.2%
Eastern Grey Kangaroo	244,600	214,840	29,760	12.2%
Wallaroo	55,427	55,210	217	0.4%
Total	**504,071**	**451,162**	**52,909**	**10.5%**

Source: Queensland Government, commercial macropod harvest update (data entered to 7 October 2026). Females are relevant to the joey estimates in Section 4.8.

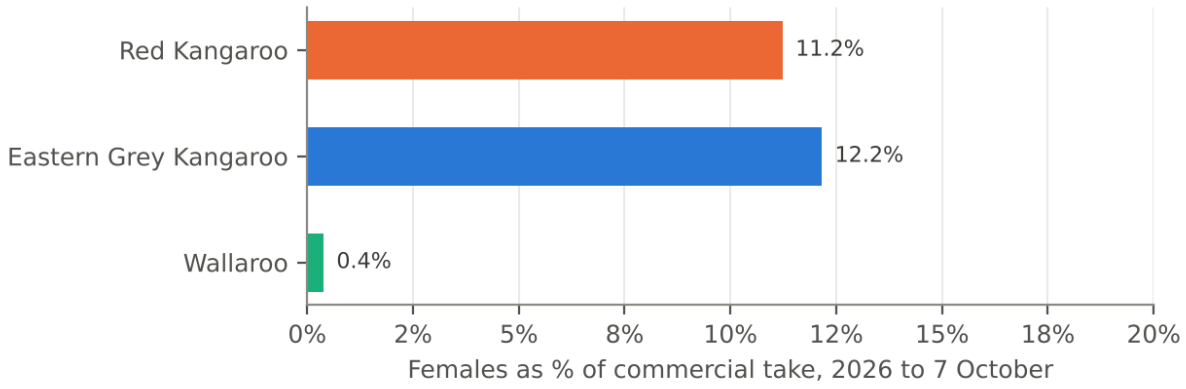


Figure 4.5. Females as a share of commercial take by species, 2026 to 7 October.

4.3 Queensland in the national picture, 1980 to 2026

This section compares Queensland's population estimate with the all-Australia mainland population estimate, the all-Australia commercial quota and the all-Australia actual (commercial) take, year by year. National figures are from the Nature Knowledge Channel national table (Appendix A). The national table records population estimates by state but quota and take only for Australia as a whole, so Queensland is measured here by its population estimate. Official Queensland take figures for 2011 and 2014–2025 are used in Section 4.3.4 as a cross-check.

4.3.1 Queensland's share of the national population estimate

Queensland has consistently held a large part of the population of commercially exploited kangaroos in Australia. Its share of the national population estimate averaged 45.3% in the 1980s, 38.5% in the 1990s, 56.2% in the 2000s, 54.2% in the 2010s and 47.9% from 2020 to 2026.

The share was lowest in 1991 (30.5%), when the New South Wales estimate was high, and highest in 2002 (65.6%), when the Queensland estimate peaked at 37,574,300. A second high came in 2012–2014 (up to 61.7%), when the Queensland estimate reached 32,803,900. The Queensland estimate then fell by 60% to a low of 12,959,400 in 2022, taking its share down to 41.8%. It has recovered to 19,308,148 for 2026, or 52.4% of the national estimate.

Queensland's weight matters. Because quotas are set largely as a proportion of the population estimate, any overestimation in Queensland flows directly into the national quota. In 2026 Queensland's estimate alone (19,308,148) is larger than the New South Wales, South Australia, Western Australia and Victoria estimates combined (17,522,028).

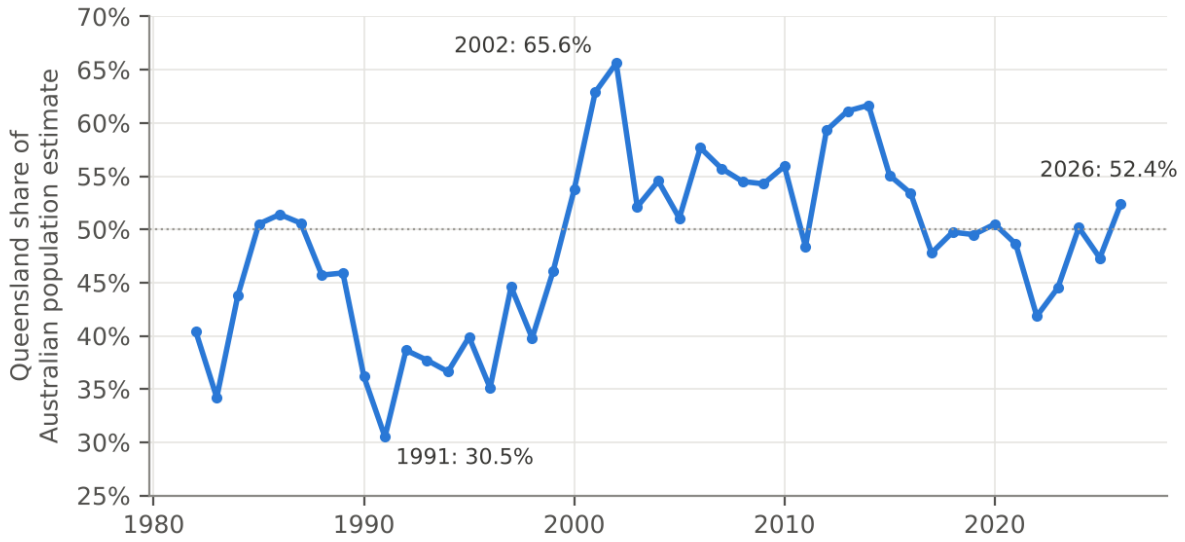


Figure 4.6. Queensland's share of the all-Australia population estimate for commercially exploited kangaroos, 1982–2026. The dotted line marks 50%.

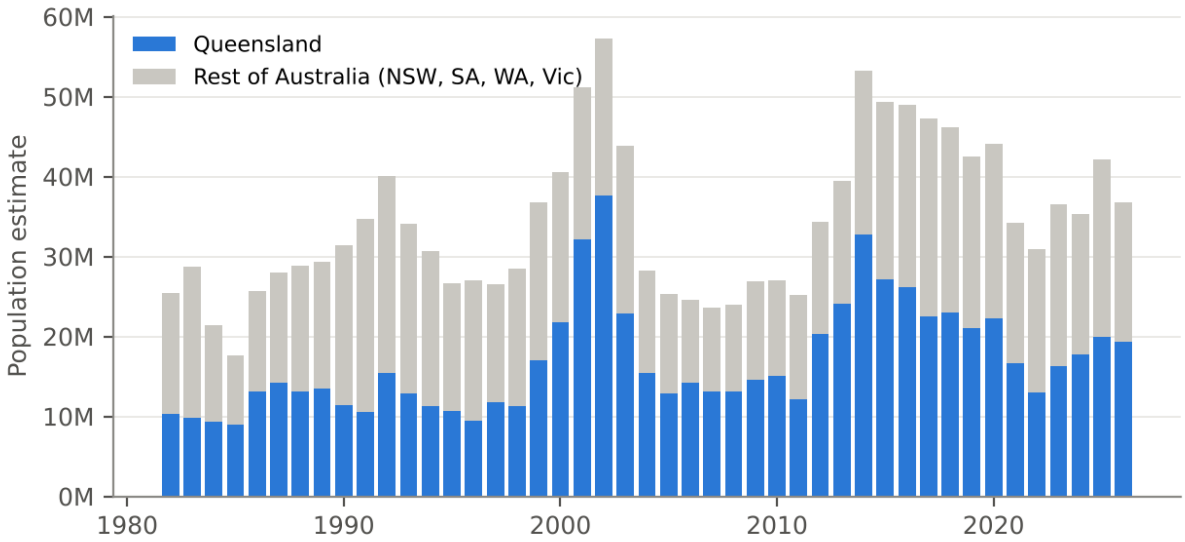


Figure 4.7. Population estimates, Queensland and the rest of Australia, 1982–2026. State estimates are not available for 1980–1981.

4.3.2 Queensland's population estimate against the national quota and take

The national quota and the national kill can be set against the Queensland population estimate alone. In the 1980s the national actual take equalled 15%–22% of the Queensland estimate, and in the mid-1990s it peaked at 32.7% (1996). Since 2012 the national take has been equal to only 5.0%–9.8% of Queensland's estimate. In 2025, 1,522,185 kangaroos were taken across all of Australia, the equivalent of 7.6% of the 19,948,800 animals estimated in Queensland alone.

The national quota, by contrast, has stayed at roughly a quarter to a third of the Queensland estimate (31.6% in 2025, 26.9% in 2026). The national quota has kept pace with population estimates while the national kill has fallen to a small fraction of them. Put simply, since 2012 the industry has taken fewer animals in a year across the whole country than 10% of Queensland's estimate alone. On the population estimates, the animals should be easy to find. That they are not taken is consistent with estimates that overstate the number of kangaroos actually present.

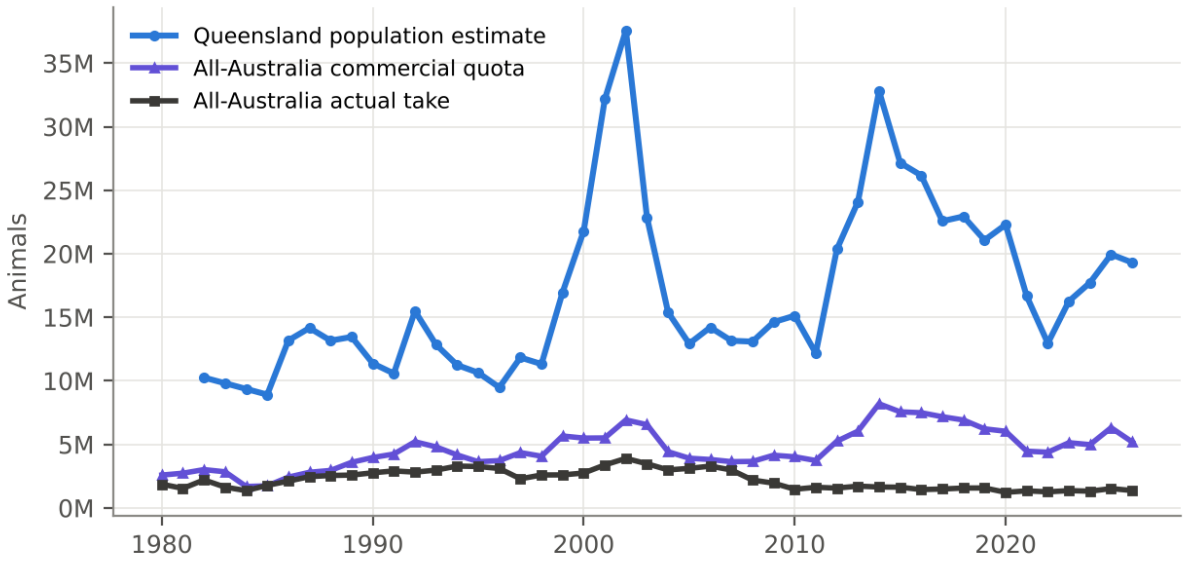


Figure 4.8. Queensland population estimate compared with the all-Australia commercial quota and actual take, 1980–2026.

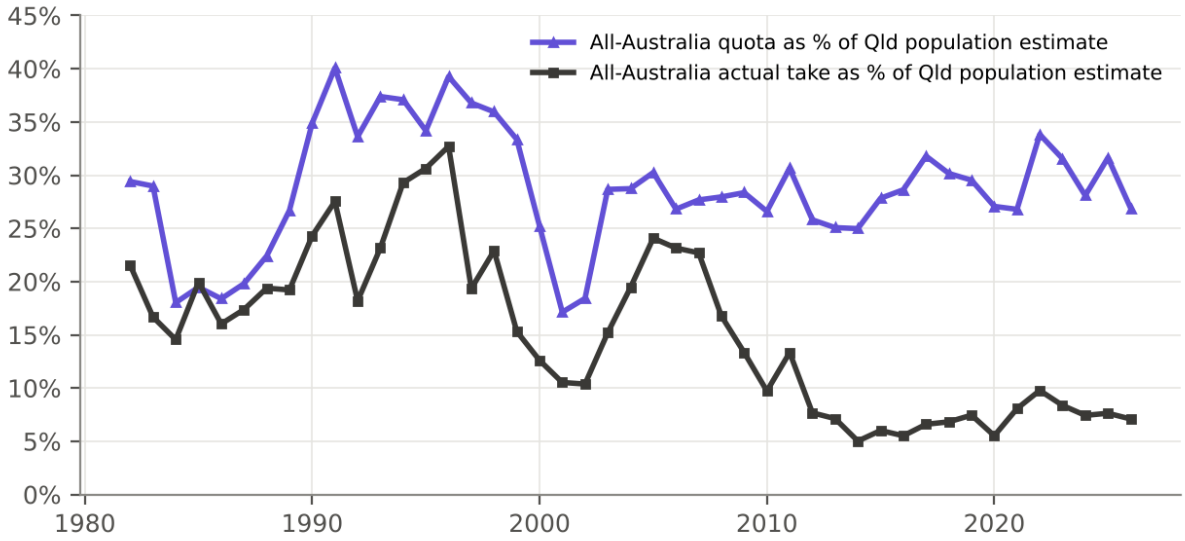


Figure 4.9. All-Australia commercial quota and actual take expressed as a percentage of the Queensland population estimate, 1982–2026.

4.3.3 Year-by-year comparison

Table 4.7 sets out, for each year, Queensland's share of the national population estimate and the national quota and take measured against the Queensland estimate. The final column shows the take that would be expected in Queensland if the national kill were spread in line with each state's share of the population estimate.

Table 4.7. Queensland population estimate compared with all-Australia population estimate, quota and actual take, 1980–2026

Year	Qld pop. est.	Aus pop. est.	Qld % of Aus pop.	Aus quota	Aus actual take	Aus quota as % of Qld pop.	Aus take as % of Qld pop.	Qld pro-rata take
1980	–	–	–	2,585,000	1,868,534	–	–	–
1981	–	–	–	2,732,500	1,535,967	–	–	–
1982	10,258,111	25,377,006	40.4%	3,016,000	2,207,045	29.4%	21.5%	892,151
1983	9,810,534	28,682,674	34.2%	2,843,000	1,635,795	29.0%	16.7%	559,502
1984	9,362,957	21,394,731	43.8%	1,688,000	1,362,143	18.0%	14.5%	596,113
1985	8,915,381	17,652,271	50.5%	1,736,000	1,777,249	19.5%	19.9%	897,610
1986	13,177,659	25,634,603	51.4%	2,423,600	2,111,936	18.4%	16.0%	1,085,656
1987	14,161,070	27,994,194	50.6%	2,804,400	2,460,497	19.8%	17.4%	1,244,661
1988	13,164,580	28,802,067	45.7%	2,949,800	2,552,348	22.4%	19.4%	1,166,603
1989	13,454,557	29,309,811	45.9%	3,589,900	2,585,323	26.7%	19.2%	1,186,783
1990	11,372,565	31,445,570	36.2%	3,966,650	2,763,250	34.9%	24.3%	999,353
1991	10,578,017	34,678,979	30.5%	4,238,800	2,912,823	40.1%	27.5%	888,489
1992	15,490,000	40,078,649	38.6%	5,207,700	2,816,649	33.6%	18.2%	1,088,607
1993	12,848,450	34,072,416	37.7%	4,804,100	2,976,198	37.4%	23.2%	1,122,302
1994	11,243,091	30,692,613	36.6%	4,170,100	3,293,227	37.1%	29.3%	1,206,351
1995	10,641,491	26,679,611	39.9%	3,636,556	3,260,448	34.2%	30.6%	1,300,470
1996	9,481,179	27,006,188	35.1%	3,723,000	3,101,123	39.3%	32.7%	1,088,725
1997	11,834,815	26,533,849	44.6%	4,353,800	2,289,687	36.8%	19.3%	1,021,262
1998	11,320,000	28,452,058	39.8%	4,069,140	2,592,557	35.9%	22.9%	1,031,481
1999	16,970,000	36,826,049	46.1%	5,661,146	2,599,203	33.4%	15.3%	1,197,752
2000	21,790,000	40,545,724	53.7%	5,495,225	2,745,798	25.2%	12.6%	1,475,641
2001	32,150,000	51,126,102	62.9%	5,507,200	3,383,355	17.1%	10.5%	2,127,580
2002	37,574,300	57,262,026	65.6%	6,921,687	3,898,716	18.4%	10.4%	2,558,267
2003	22,856,128	43,845,532	52.1%	6,552,194	3,474,483	28.7%	15.2%	1,811,205
2004	15,389,407	28,214,521	54.5%	4,421,892	2,992,071	28.7%	19.4%	1,632,004
2005	12,925,683	25,314,921	51.1%	3,909,550	3,112,344	30.2%	24.1%	1,589,149
2006	14,207,860	24,636,291	57.7%	3,808,680	3,289,376	26.8%	23.2%	1,896,998
2007	13,156,658	23,606,929	55.7%	3,641,271	2,986,470	27.7%	22.7%	1,664,425
2008	13,086,638	24,008,610	54.5%	3,659,129	2,193,207	28.0%	16.8%	1,195,476
2009	14,620,242	26,934,833	54.3%	4,145,781	1,950,114	28.4%	13.3%	1,058,523
2010	15,125,067	27,040,323	55.9%	4,023,021	1,469,760	26.6%	9.7%	822,114
2011	12,172,807	25,158,026	48.4%	3,730,710	1,623,576	30.6%	13.3%	785,573
2012	20,345,243	34,303,677	59.3%	5,249,680	1,560,586	25.8%	7.7%	925,571
2013	24,088,150	39,410,480	61.1%	6,039,401	1,716,139	25.1%	7.1%	1,048,924
2014	32,803,900	53,198,517	61.7%	8,194,624	1,645,930	25.0%	5.0%	1,014,933
2015	27,159,850	49,313,027	55.1%	7,560,091	1,632,098	27.8%	6.0%	898,901
2016	26,162,000	48,993,435	53.4%	7,490,100	1,442,874	28.6%	5.5%	770,480
2017	22,566,750	47,226,027	47.8%	7,174,072	1,488,269	31.8%	6.6%	711,163
2018	22,935,950	46,109,264	49.7%	6,918,174	1,565,140	30.2%	6.8%	778,541
2019	21,071,900	42,560,970	49.5%	6,222,301	1,570,473	29.5%	7.5%	777,540
2020	22,287,100	44,135,222	50.5%	6,032,595	1,229,510	27.1%	5.5%	620,869
2021	16,663,850	34,268,089	48.6%	4,464,471	1,344,369	26.8%	8.1%	653,738
2022	12,959,400	30,966,364	41.8%	4,383,647	1,266,408	33.8%	9.8%	529,991
2023	16,267,200	36,554,240	44.5%	5,132,143	1,361,679	31.5%	8.4%	605,968
2024	17,727,700	35,332,661	50.2%	4,979,257	1,317,231	28.1%	7.4%	660,903
2025	19,948,800	42,163,953	47.3%	6,311,992	1,522,185	31.6%	7.6%	720,183
2026	19,308,148	36,830,176	52.4%	5,191,655	1,369,000	26.9%	7.1%	717,696

Notes: Australian population estimate is the sum of the state estimates in Appendix A (this corrects the totals listed for 2002 and 2009; see Section 4.10). Qld pro-rata take = Australian actual take × Queensland share of the Australian population estimate. 2026 Australian take of 1,369,000 is an estimate. "–" = not available.

4.3.4 Cross-check against recorded Queensland take

For the years in which Queensland Government take figures are held, the pro-rata estimate can be compared with the recorded take. From 2011 to 2016 Queensland's recorded take was above the pro-rata figure (1,061,009 against 898,901 in 2015, for example), so Queensland supplied more of the national kill than its share of the population would suggest. From 2019 recorded take has generally been at or below the pro-rata figure. In 2025 Queensland took 609,842 kangaroos, against a pro-rata figure of 720,183: 40.1% of the national take, while holding 47.3% of the national population estimate.

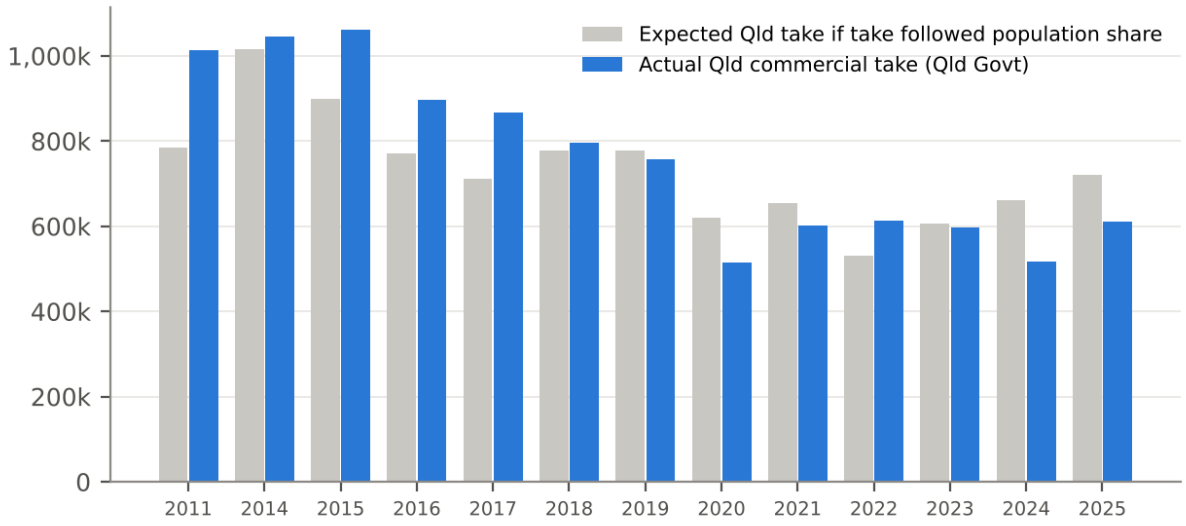


Figure 4.10. Queensland commercial take expected from its population share compared with the recorded Queensland take, 2011 and 2014–2025.

4.4 Persistent shortfall against quotas, 2014–2025

In every year from 2014 to 2025, and for each of the three species, the number of animals taken commercially and the number covered by DMPs have been well below the quotas set by the Queensland Government.

Table 4.8. Quota and take, totals for 2014–2025 (2025 = Queensland Government actual)

Species	Comm. quota	Comm. take	% taken	Unused comm. quota	DMP quota	DMP issued	% issued	Unused DMP quota
Red Kangaroo	13,513,850	3,140,037	23.2%	10,373,813	1,364,968	499,403	36.6%	865,565
Eastern Grey Kangaroo	18,539,950	4,717,141	25.4%	13,822,809	2,778,427	1,354,553	48.8%	1,423,874
Wallaroo	4,706,350	1,018,691	21.6%	3,687,659	667,771	287,945	43.1%	379,826
Total	**36,760,150**	**8,875,869**	**24.1%**	**27,884,281**	**4,811,166**	**2,141,901**	**44.5%**	**2,669,265**

Note: 2025 DMP figures are estimates. Special quotas are not included in the commercial data.

4.4.1 Commercial quotas

Over the 12 years, 24.1% of the combined commercial quota was taken, leaving 27,884,281 animals of quota unused. For the Red Kangaroo the annual rate ranged from 18.2% (2014) to 39.1% (2021); for the Eastern Grey Kangaroo from 15.5% (2020) to 35.8% (2022); and for the Wallaroo from 10.2% (2021) to 34.7% (2022). In 33 of the 36 species-years, take was below a third of quota.

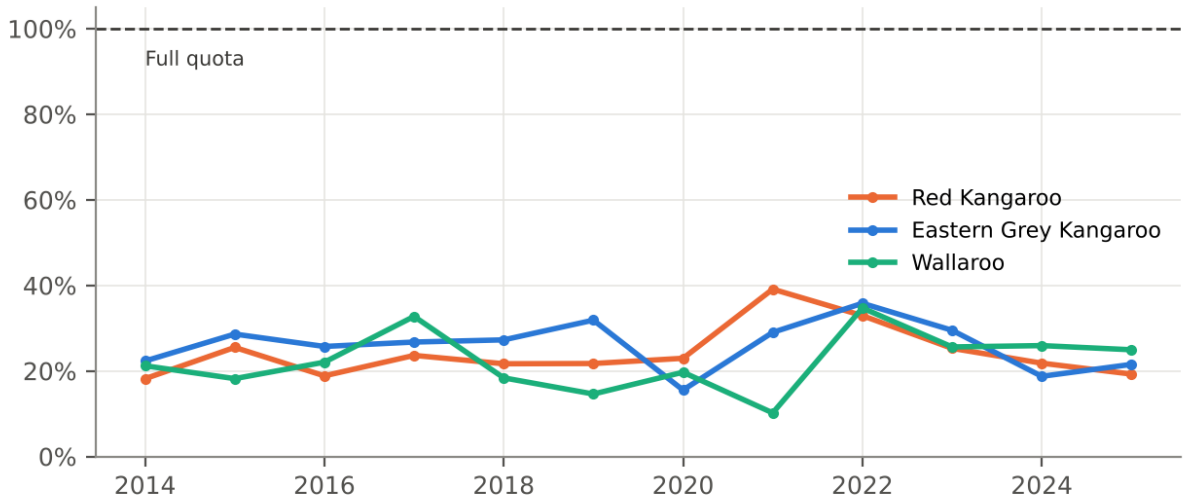


Figure 4.11. Commercial take as a share of commercial quota, 2014–2025. The dashed line marks the full quota.

4.4.2 DMP quotas

Across the period, DMPs were issued for 44.5% of the DMP quota. The shortfall widened markedly from 2020. Permits issued as a share of DMP quota fell from 55% (Red), 72% (Eastern Grey) and 52% (Wallaroo) in 2014–2019 to 16%, 17% and 28% in 2020–2025. Falling demand for permits is consistent with fewer animals on the ground.

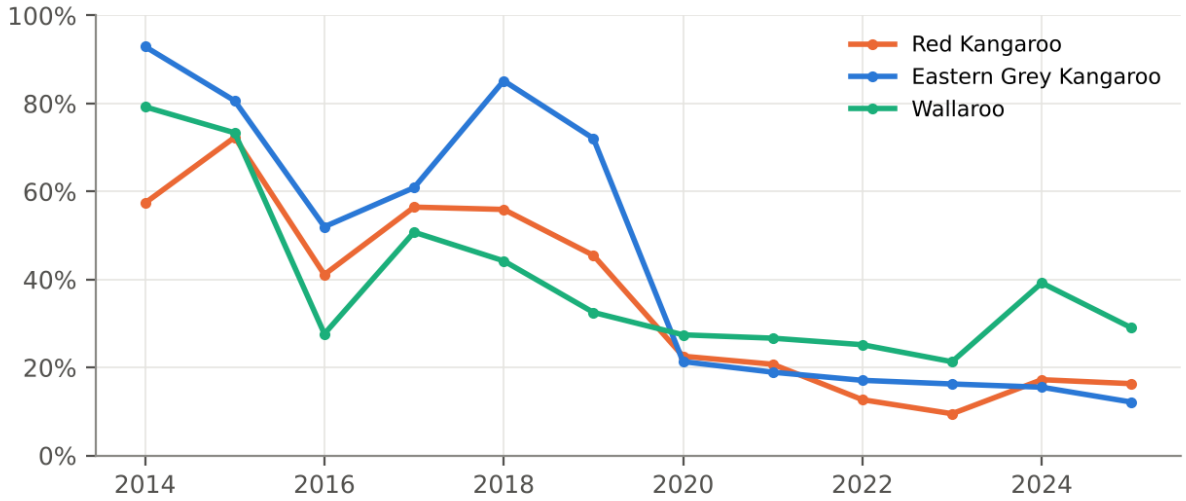


Figure 4.12. DMP permits issued as a share of DMP quota, 2014–2025.

4.4.3 Quotas as a share of population estimates

Taken together, the DMP and commercial quotas over the 12 years targeted 14,878,818 Red Kangaroos (20.2% of the summed annual population estimates of 73,486,500), 21,318,377 Eastern Grey Kangaroos (14.4% of 148,304,400) and 5,374,121 Wallaroos (14.6% of 36,763,500).

The Nature Knowledge Channel's population estimates for the same 12 years are far lower: 20,996,000 Red Kangaroos, 42,370,000 Eastern Grey Kangaroos and 11,488,000 Wallaroos. Measured against these, the Queensland Government's combined quotas targeted:

- **Red Kangaroo:** 71% of the population; the animals actually killed (commercial take plus DMP permits issued, 3,639,440) equal 17.3%, rising to 23.4% when joeys are included.
- **Eastern Grey Kangaroo:** 50% of the population; the animals actually killed (commercial take plus DMP permits issued, 6,071,694) equal 14.3%, rising to 19.1% when joeys are included.
- **Wallaroo:** 47% of the population; the animals actually killed (commercial take plus DMP permits issued, 1,306,636) equal 11.4%, rising to 15.2% when joeys are included.

On these figures the kill substantially exceeds the best-case reproduction rate for each species. It also helps explain why less than a quarter of the commercial quota is achieved and why demand for DMPs has fallen.

4.5 Red Kangaroo (Osphranter rufus)

4.5.1 What has happened

- **Population estimate:** 8,102,000 in 2014; low of 4,135,700 in 2021 (49% below 2014); 7,467,150 in 2025 (-7.8% on 2014). The 2025 survey figure used to set 2026 quotas is 6,956,329.
- **Commercial quota:** 1,529,450 in 2014; low of 673,050 in 2021; 1,377,500 in 2025. The 2026 quota is 1,301,000.
- **Commercial take:** ranged from 200,779 (2020) to 340,821 (2015). The 2025 actual take was 265,271, 4.6% below 2014 and 5.7% above 2024. In total, 3,140,037 were taken commercially over the 12 years.
- **Shortfall:** 23.2% of the commercial quota was taken over the period, leaving 10,373,813 animals of quota unused.
- **DMPs:** permits peaked at 103,393 animals in 2015 (72% of the DMP quota). Over the 12 years permits covered 499,403 animals, 37% of the DMP quota; the share fell from 55% in 2014–2019 to 16% in 2020–2025. The 2025 figure (20,500) is an estimate.

4.5.2 Annual data, 2014–2025

Table 4.9. Red Kangaroo: quotas, take and population estimates, 2014–2025

Year	DMP quota	DMP permits issued	% of DMP quota	Commercial quota	Actual comm. take	% of comm. quota	Qld Govt pop. estimate
2025 *	125,603	20,500	16.3%	1,377,500	265,271	19.3%	7,467,150
2024	127,435	21,945	17.2%	1,151,300	251,066	21.8%	6,371,750
2023	120,634	11,450	9.5%	1,071,600	270,801	25.3%	6,031,700
2022	91,903	11,650	12.7%	837,150	275,632	32.9%	4,595,150
2021	82,714	17,150	20.7%	673,050	263,243	39.1%	4,135,700
2020	99,742	22,500	22.6%	874,900	200,779	22.9%	4,987,200
2019	105,829	48,142	45.5%	996,050	216,437	21.7%	5,291,450
2018	130,534	72,999	55.9%	1,239,350	268,571	21.7%	6,526,700
2017	115,373	65,127	56.4%	1,090,600	257,646	23.6%	5,768,650
2016	141,224	58,055	41.1%	1,335,950	251,778	18.8%	7,061,200
2015	142,957	103,393	72.3%	1,336,950	340,821	25.5%	7,147,850
2014	81,020	46,492	57.4%	1,529,450	277,992	18.2%	8,102,000
Total	**1,364,968**	**499,403**	**36.6%**	**13,513,850**	**3,140,037**	**23.2%**	**73,486,500**

Notes: * 2025 commercial take is the Queensland Government actual (Macropod Management Program Annual Report 2025); 2025 DMP figure is an estimate. Annual population estimate is based on the previous year's survey. Special quotas are not included. The zone methodology changed in 2022; harvest zones came into effect for DMPs on 1 January 2022. DMP figures are animals covered by permits issued, not confirmed take.

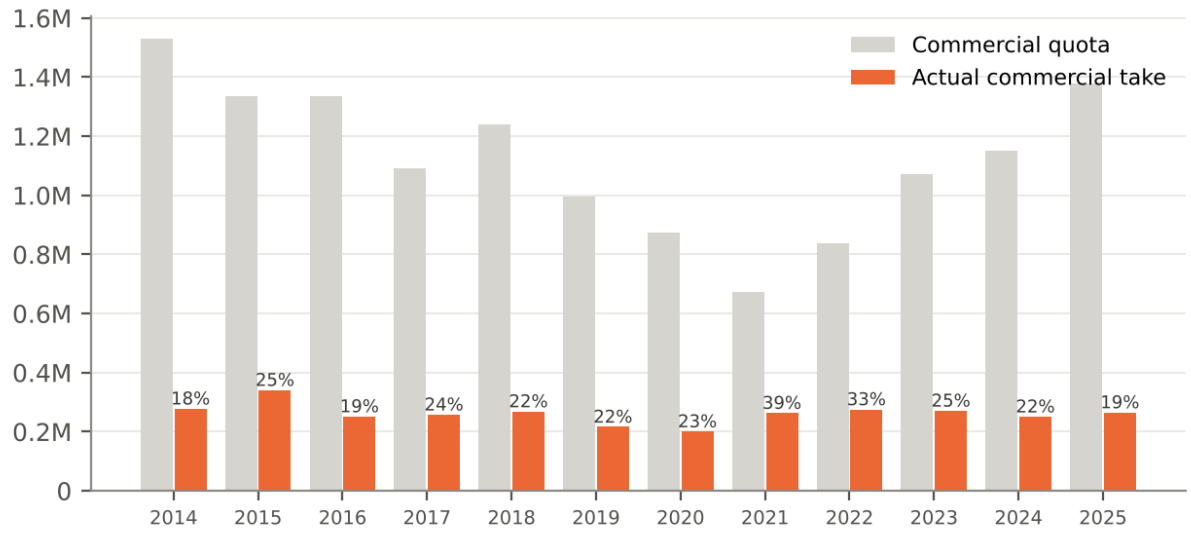


Figure 4.13. Red Kangaroo: commercial quota and actual take, with the percentage of quota achieved.

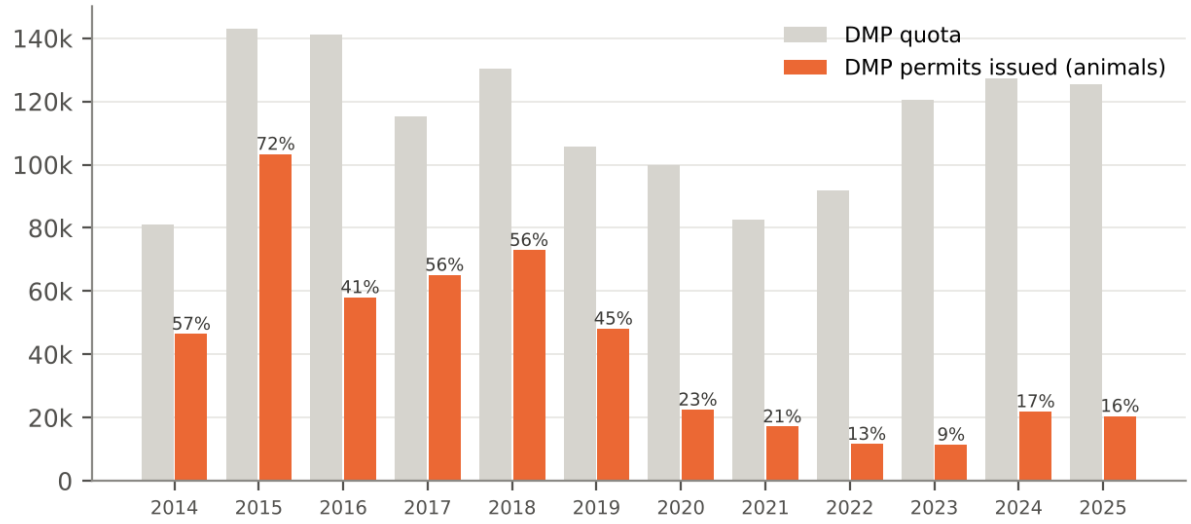


Figure 4.14. Red Kangaroo: DMP quota and permits issued, with the percentage of quota issued.

4.5.3 2026 to date

- **Commercial take:** 204,044 to 7 October, 15.7% of the 2026 quota and 77% of the full 2025 take.
- **Zones and sex:** Zone 2 accounts for 98,242 (48%). Females were 11.2% of the animals taken.
- **DMPs:** 11,710 animals to 28 July, 8.4% of the 2026 DMP quota.

4.6 Eastern Grey Kangaroo (Macropus giganteus)

4.6.1 What has happened

- **Population estimate:** 18,252,150 in 2014; low of 6,625,550 in 2022 (64% below 2014); 10,672,400 in 2025 (-41.5% on 2014). The 2025 survey figure used to set 2026 quotas is 11,169,185.
- **Commercial quota:** 2,536,350 in 2014; low of 734,750 in 2022; 1,333,000 in 2025. The 2026 quota is 1,394,250.

- **Commercial take:** ranged from 209,284 (2024) to 602,400 (2015). The 2025 actual take was 286,939, 49.3% below 2014 and 37.1% above 2024. In total, 4,717,141 were taken commercially over the 12 years.
- **Shortfall:** 25.4% of the commercial quota was taken over the period, leaving 13,822,809 animals of quota unused.
- **DMPs:** permits peaked at 248,719 animals in 2015 (81% of the DMP quota). Over the 12 years permits covered 1,354,553 animals, 49% of the DMP quota; the share fell from 72% in 2014–2019 to 17% in 2020–2025. The 2025 figure (25,900) is an estimate.

4.6.2 Annual data, 2014–2025

Table 4.10. Eastern Grey Kangaroo: quotas, take and population estimates, 2014–2025

Year	DMP quota	DMP permits issued	% of DMP quota	Commercial quota	Actual comm. take	% of comm. quota	Qld Govt pop. estimate
2025 *	213,448	25,900	12.1%	1,333,000	286,939	21.5%	10,672,400
2024	186,719	28,972	15.5%	1,117,100	209,284	18.7%	9,592,950
2023	165,341	26,863	16.2%	909,100	268,140	29.5%	8,267,050
2022	132,511	22,629	17.1%	734,750	263,045	35.8%	6,625,550
2021	200,868	38,019	18.9%	1,087,450	315,451	29.0%	10,043,400
2020	291,064	62,114	21.3%	1,696,550	263,409	15.5%	14,553,200
2019	249,573	179,849	72.1%	1,516,950	483,385	31.9%	12,478,650
2018	259,843	221,312	85.2%	1,643,400	447,936	27.3%	12,992,150
2017	279,859	170,358	60.9%	1,804,200	482,544	26.7%	13,992,950
2016	308,134	160,187	52.0%	2,055,250	528,547	25.7%	15,406,700
2015	308,545	248,719	80.6%	2,105,850	602,400	28.6%	15,427,250
2014	182,522	169,631	92.9%	2,536,350	566,061	22.3%	18,252,150
Total	**2,778,427**	**1,354,553**	**48.8%**	**18,539,950**	**4,717,141**	**25.4%**	**148,304,400**

Notes: * 2025 commercial take is the Queensland Government actual (Macropod Management Program Annual Report 2025); 2025 DMP figure is an estimate. Annual population estimate is based on the previous year's survey. Special quotas are not included. The zone methodology changed in 2022; harvest zones came into effect for DMPs on 1 January 2022. DMP figures are animals covered by permits issued, not confirmed take.

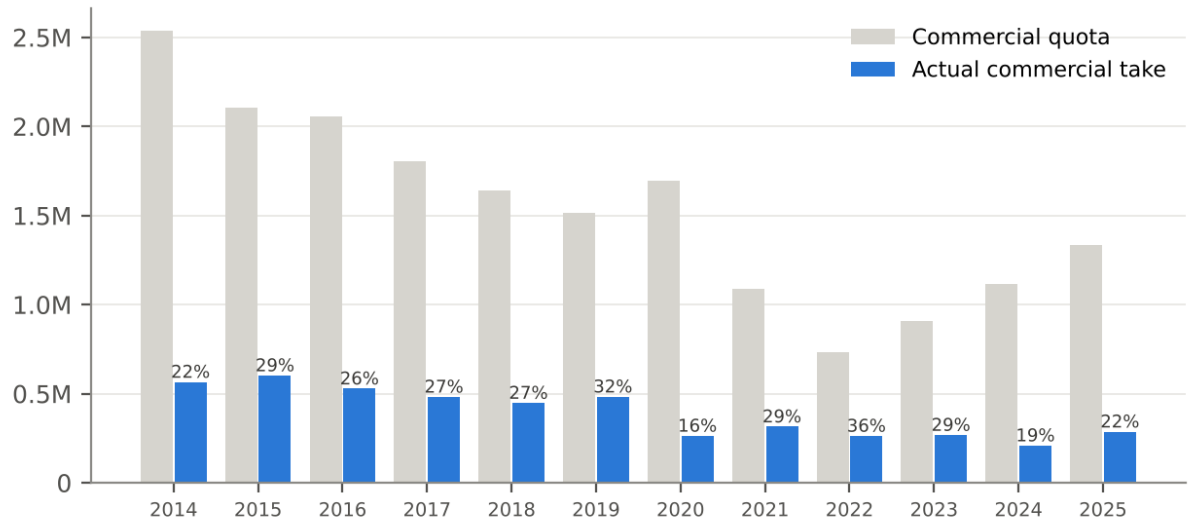


Figure 4.15. Eastern Grey Kangaroo: commercial quota and actual take, with the percentage of quota achieved.

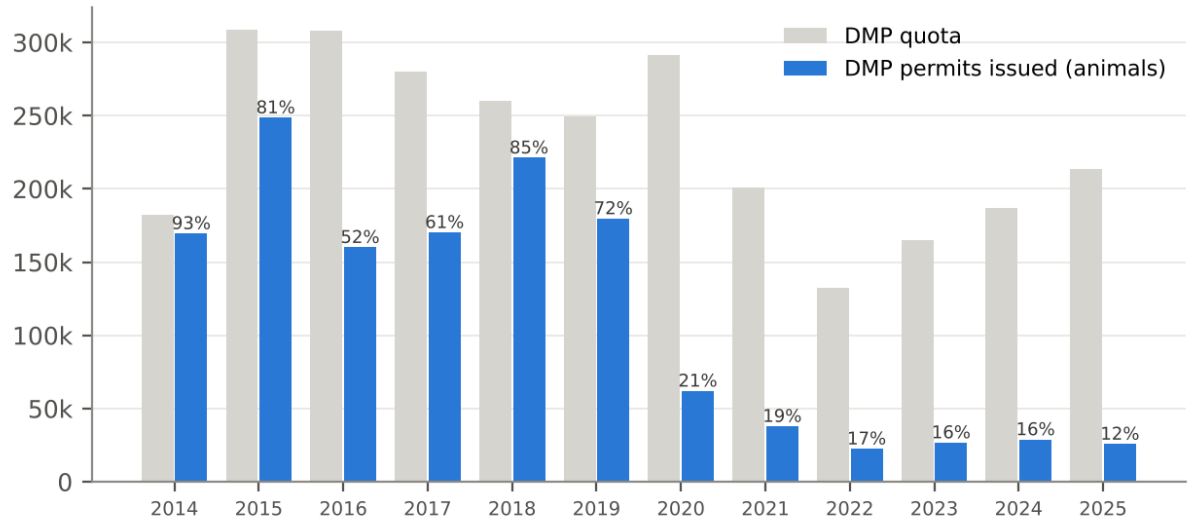


Figure 4.16. Eastern Grey Kangaroo: DMP quota and permits issued, with the percentage of quota issued.

4.6.3 2026 to date

- **Commercial take:** 244,600 to 7 October, 17.5% of the 2026 quota and 85% of the full 2025 take.
- **Zones and sex:** Zone 4 accounts for 147,133 (60%). Females were 12.2% of the animals taken.
- **DMPs:** 24,882 animals to 28 July, 11.1% of the 2026 DMP quota.

4.7 Wallaroo (Osphranter robustus)

4.7.1 What has happened

- **Population estimate:** 6,449,750 in 2014; low of 1,738,700 in 2022 (73% below 2014); 1,809,250 in 2025 (-71.9% on 2014). The 2025 survey figure used to set 2026 quotas is 1,182,634.
- **Commercial quota:** 945,500 in 2014; low of 211,950 in 2022; 231,050 in 2025. The 2026 quota is 155,650.
- **Commercial take:** ranged from 22,470 (2021) to 200,445 (2014). The 2025 actual take was 57,632, 71.2% below 2014 and 2.0% above 2024. In total, 1,018,691 were taken commercially over the 12 years.
- **Shortfall:** 21.6% of the commercial quota was taken over the period, leaving 3,687,659 animals of quota unused.
- **DMPs:** permits peaked at 67,246 animals in 2015 (73% of the DMP quota). Over the 12 years permits covered 287,945 animals, 43% of the DMP quota; the share fell from 52% in 2014–2019 to 28% in 2020–2025. The 2025 figure (10,500) is an estimate.

4.7.2 Annual data, 2014–2025

Table 4.11. Wallaroo: quotas, take and population estimates, 2014–2025

Year	DMP quota	DMP permits issued	% of DMP quota	Commercial quota	Actual comm. take	% of comm. quota	Qld Govt pop. estimate
2025 *	36,185	10,500	29.0%	231,050	57,632	24.9%	1,809,250
2024	35,260	13,830	39.2%	218,000	56,497	25.9%	1,763,000
2023	39,367	8,388	21.3%	229,700	58,809	25.6%	1,968,450
2022	34,774	8,754	25.2%	211,950	73,556	34.7%	1,738,700
2021	46,695	12,450	26.7%	220,650	22,470	10.2%	2,484,750
2020	54,934	15,065	27.4%	253,700	49,956	19.7%	2,746,700
2019	66,036	21,473	32.5%	400,950	58,540	14.6%	3,301,800
2018	68,342	30,229	44.2%	431,250	79,240	18.4%	3,417,100
2017	56,103	28,478	50.8%	390,800	127,939	32.7%	2,805,150
2016	73,882	20,420	27.6%	525,500	115,819	22.0%	3,694,100
2015	91,695	67,246	73.3%	647,300	117,788	18.2%	4,584,750
2014	64,498	51,112	79.2%	945,500	200,445	21.2%	6,449,750
Total	**667,771**	**287,945**	**43.1%**	**4,706,350**	**1,018,691**	**21.6%**	**36,763,500**

Notes: * 2025 commercial take is the Queensland Government actual (Macropod Management Program Annual Report 2025); 2025 DMP figure is an estimate. Annual population estimate is based on the previous year's survey. Special quotas are not included. The zone methodology changed in 2022; harvest zones came into effect for DMPs on 1 January 2022. DMP figures are animals covered by permits issued, not confirmed take.

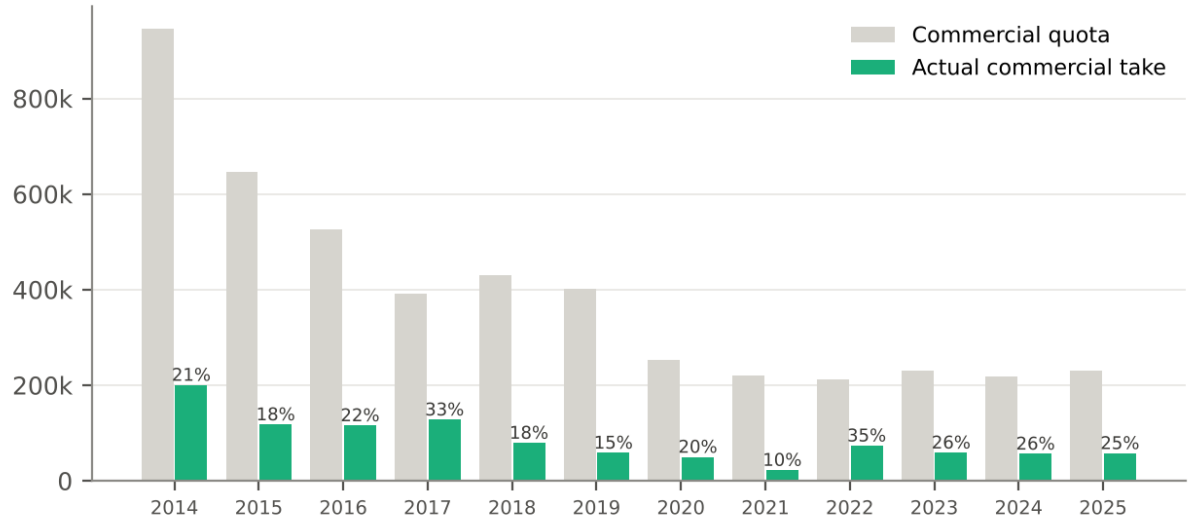


Figure 4.17. Wallaroo: commercial quota and actual take, with the percentage of quota achieved.

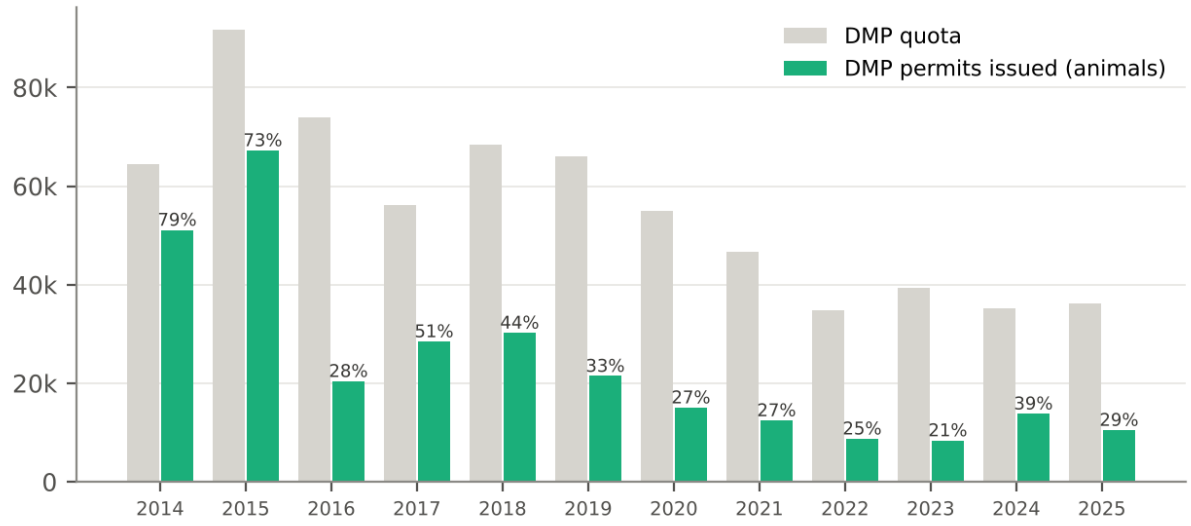


Figure 4.18. Wallaroo: DMP quota and permits issued, with the percentage of quota issued.

4.7.3 2026 to date

- **Commercial take:** 55,427 to 7 October, 35.6% of the 2026 quota and 96% of the full 2025 take.
- **Zones and sex:** Zone 2 accounts for 32,913 (59%). Females were 0.4% of the animals taken.
- **DMPs:** 3,870 animals to 28 July, 16.4% of the 2026 DMP quota.

4.8 Joeys

Joeys are not counted in any government figure. When a female kangaroo is shot, her pouch young and any young-at-foot either are killed under the code of practice or die from starvation, predation or exposure. Every count of adults in this report is therefore an undercount of the animals that die.

4.8.1 National estimate since 1980

The Nature Knowledge Channel national table estimates 26,500,000 joeys killed alongside the 103,853,163 kangaroos taken commercially in Australia from 1980 to 2026, about 25.5 joeys for every 100 adults. Had the full national quota of 217,359,735 been taken, the equivalent figure would be 55,478,909 joeys.

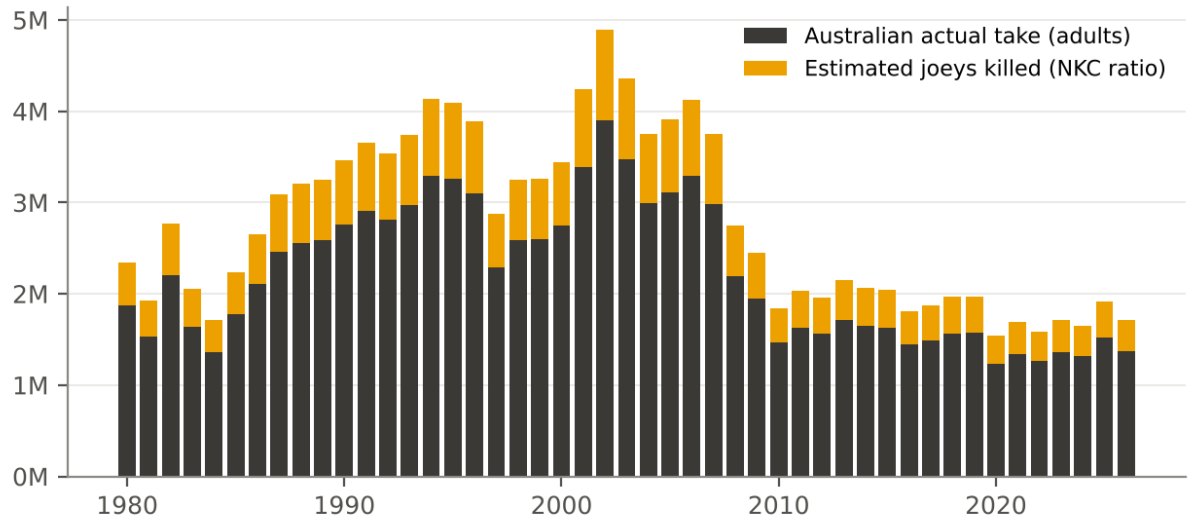


Figure 4.19. All-Australia commercial take with estimated joeys killed (at 25.5 per 100 adults), 1980–2026.

4.8.2 Queensland

Applying the national ratio to the Queensland commercial take held for 2011 and 2014–2025 (9,889,199 animals) gives about 2,523,000 joeys. For 2026 to date, the commercial take of 504,071 implies about 129,000 joeys.

The Nature Knowledge Channel species estimates for 2014–2025, which also cover DMPs, have been updated for the 2025 actual take:

Table 4.12. Estimated joeys killed in Queensland, 2014–2025, commercial take and DMPs

Species	Commercial take	DMP permits issued	Adults	Estimated joeys	Total animals
Red Kangaroo	3,140,037	499,403	3,639,440	1,273,800	4,913,200
Eastern Grey Kangaroo	4,717,141	1,354,553	6,071,694	2,007,800	8,079,500
Wallaroo	1,018,691	287,945	1,306,636	443,900	1,750,500
Total	**8,875,869**	**2,141,901**	**11,017,770**	**3,725,500**	**14,743,200**

Method: joey ratios as in the Nature Knowledge Channel master data (Red 35, Eastern Grey 33 and Wallaroo 34 joeys per 100 adults), applied to updated totals.

Two points about these estimates. First, the Queensland industry reports a strongly male-biased take: females were 10.1% of the 2025 commercial take (Queensland Government) and 10.5% in 2026 to date, with almost no female Wallaroos taken. Assuming one dependent young per female shot, the 2025 commercial take alone accounts for at least 61,600 joeys. Second, DMP killing is not sex-restricted or recorded, so DMP permits are likely to account for proportionally more joeys than commercial take. The species estimates above lie between this recorded-female minimum and the national ratio, and should be read as indicative.

4.9 Trends across the three species

Table 4.13. Summary of trends

Measure	Red Kangaroo	Eastern Grey Kangaroo	Wallaroo
Population estimate, 2014 to 2025	−7.8%	−41.5%	−71.9%
Lowest population estimate	4,135,700 (2021)	6,625,550 (2022)	1,738,700 (2022)
Population basis for 2026 quotas (2025 survey)	6,956,329	11,169,185	1,182,634
Commercial quota, 2014 to 2026	−14.9%	−45.0%	−83.5%
Commercial take, 2014 to 2025	−4.6%	−49.3%	−71.2%
Range of % commercial quota achieved	18%–39%	16%–36%	10%–35%
DMP issued as % of quota, 2014–2019	55.0%	72.4%	52.1%
DMP issued as % of quota, 2020–2025	16.2%	17.2%	27.9%
2026 commercial take as % of quota (to 7 Oct)	15.7%	17.5%	35.6%

4.9.1 Trends identified

- **Constant shortfall:** commercial take has stayed at roughly one-fifth to one-quarter of quota for all three species, with no year above 40%.
- **A step change in DMP issuing from 2020:** before 2020 permits were issued on average for more than half of the DMP quota; since 2020 the share has been between about 10% and 40%.
- **Population decline followed by divergence:** all three population estimates fell to lows in 2021–2022. Red and Eastern Grey Kangaroo estimates have since risen; the Wallaroo estimate has not.
- **Falling take for Eastern Greys and Wallaroos:** Eastern Grey Kangaroo take in 2025 was about half the 2014 level and Wallaroo take 71% lower, while Red Kangaroo take has held in a steady band.
- **A smaller part of the national kill:** recorded Queensland take fell from about two-thirds of the national kill in 2014–2015 to about two-fifths in 2024–2025, below Queensland's share of the national population estimate.
- **2026 is running higher for Eastern Greys and Wallaroos:** Eastern Grey Kangaroo commercial take to 7 October already exceeds the full 2024 total, and Wallaroo take as a share of quota is the highest in the series.

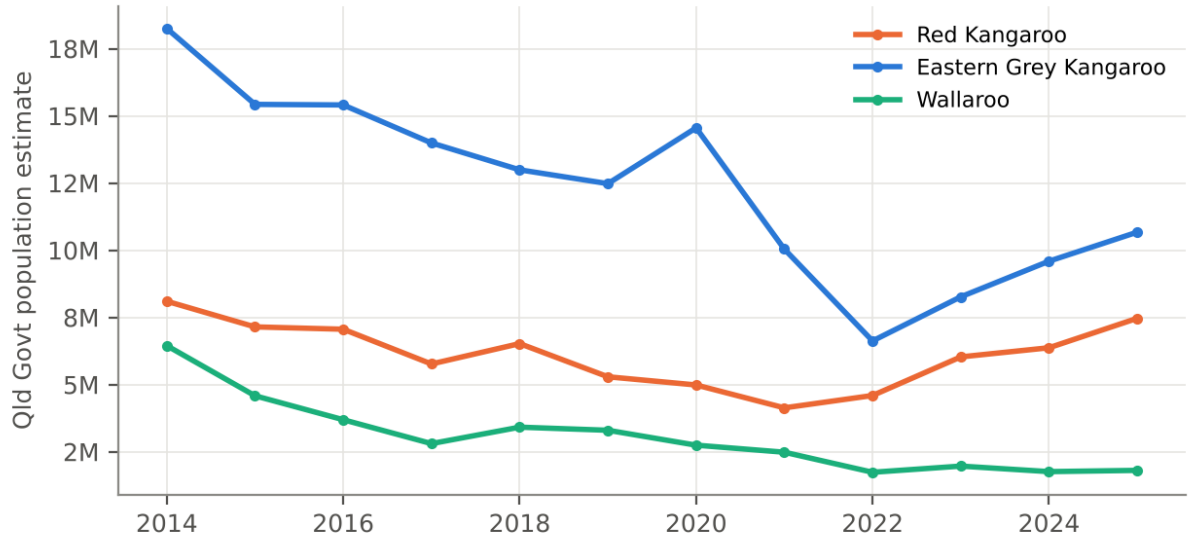


Figure 4.20. Queensland Government population estimates by species, 2014–2025.

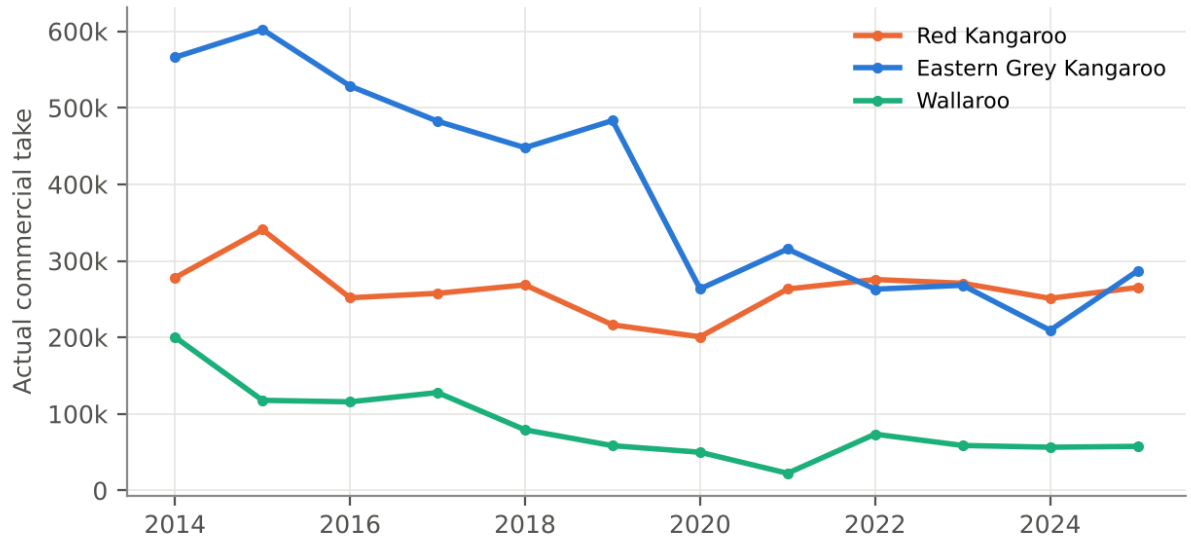


Figure 4.21. Actual commercial take by species, 2014–2025 (2025 = Queensland Government actual).

4.10 Data notes, checks and corrections

4.10.1 Data notes

- Each year's Queensland Government population estimate is based on the previous year's survey.
- Special quotas are not included in the commercial data.
- The zone methodology changed in 2022; harvest zones came into effect for DMPs on 1 January 2022.
- DMP figures are the numbers of animals covered by permits issued, not confirmed take. Commercial take figures are tagged counts.
- 2026 figures are partial: commercial take to 7 October 2026 and DMPs to 28 July 2026.

4.10.2 Table checks

Every addition and percentage in the source tables was recalculated. The following were found and corrected in this chapter:

Table 4.14. Checks and corrections

Item	Finding
Species tables, 2025 row	2025 estimates replaced by Queensland Government actuals: Red 265,271; Eastern Grey 286,939; Wallaroo 57,632 (total 609,842, matching the Annual Report 2025).
Species tables, TOTAL rows	Master totals still used the old 2025 estimates. Corrected commercial take totals: Red 3,140,037 (was 3,150,266); Eastern Grey 4,717,141 (was 4,693,492); Wallaroo 1,018,691 (was 1,007,269); all species 8,875,869 (was 8,851,027).
Eastern Grey 2025 take	Master shows 286,933; the Queensland Government figure is 286,939.
Red Kangaroo 2020 DMP %	Master shows 26%; 22,500 ÷ 99,742 = 22.6%.
Red Kangaroo 2025 DMP quota	125,603 is 1.68% of the 7,467,150 estimate; the 2% rule gives 149,343. Worth checking against the source.
National table, 2002 total population	Listed 57,430,026; the state figures sum to 57,262,026 (difference 168,000).
National table, 2009 total population	Listed 25,896,505; the state figures sum to 26,934,833 (difference 1,038,328).
National table, 1993 total population	Typing error "34,072416" should read 34,072,416 (sum checks).
National table, Victoria 2024	Population 2,363,850 is identical to 2023; may be a carried-over figure.
National table, totals	1980–2026: quota 217,359,735; actual take 103,853,163 (1980–2025: 212,168,080 and 102,484,163). Joey row is consistent with these totals at 25.5 joeys per 100 adults.
National table, 2026 take	1,369,000 is an estimate, not a recorded total.
2026 zone tables	All zone and species totals add correctly. The Queensland harvest update page displays some zone quotas (Zone 1 Red 17,650, Zone 1 Wallaroo 1,300, Zone 5 Eastern Grey 742,100) that differ from the 2026 Quota Submission (74,850, 12,300 and 473,500); the page's own percentages match the Submission, which is used here.
DMP 2025	Master estimates imply permits for 15.2% of the 2025 DMP quota; the Annual Report 2025 says DMP take averaged 12% of the allowable limit.
Queensland population, 2014–2025	The Queensland figures in the national table match the sum of the three species estimates in every year.

Sources

- Nature Knowledge Channel master data: "Queensland: Commercially exploited Kangaroo species, Commercial and Damage Mitigation Permit (DMP) analysis 2014 to 2026 by species".
- Nature Knowledge Channel: "Population estimates for commercially exploited Kangaroo and Wallaby species in shooting zones by state and all Australia mainland and quotas and actual take for all Australia mainland: 1980–2026".
- Queensland Government, Macropod Management Program Annual Report 2025 (qld.gov.au).
- Queensland Government, 2026 Quota Submission, Queensland Macropod Management Program (qld.gov.au).
- Queensland Government, Harvest update: commercial macropod harvest 2026, data to 7 October 2026 (qld.gov.au).
- Queensland Government, Kangaroo damage mitigation permits (environment.qld.gov.au).
- Queensland Government, Macropod Management Program Annual Report 2024.
- Australian Government, kangaroo population, quota and harvest statistics by state (2011 Queensland figures, via Senate Estimates answer q27, aph.gov.au).

Appendix A. National table, 1980–2026 (checked)

Table 4.15. Population estimates for commercially exploited kangaroo and wallaby species in shooting zones by state and all-Australia mainland, with all-Australia quota and actual take, 1980–2026

Year	NSW pop.	QLD pop.	SA pop.	WA pop.	VIC pop.	Australia pop.	Australia quota	Australia take
1980	–	–	–	–	–	–	2,585,000	1,868,534
1981	–	–	–	–	–	–	2,732,500	1,535,967
1982	10,724,400	10,258,111	2,831,595	1,562,900	–	25,377,006	3,016,000	2,207,045
1983	15,024,000	9,810,534	1,984,440	1,863,700	–	28,682,674	2,843,000	1,635,795
1984	8,692,000	9,362,957	1,175,274	2,164,500	–	21,394,731	1,688,000	1,362,143
1985	5,299,200	8,915,381	972,390	2,465,300	–	17,652,271	1,736,000	1,777,249
1986	8,178,490	13,177,659	1,519,554	2,758,900	–	25,634,603	2,423,600	2,111,936
1987	9,251,712	14,161,070	1,528,912	3,052,500	–	27,994,194	2,804,400	2,460,497
1988	10,918,210	13,164,580	1,373,177	3,346,100	–	28,802,067	2,949,800	2,552,348
1989	10,497,580	13,454,557	1,917,074	3,440,600	–	29,309,811	3,589,900	2,585,323
1990	14,661,800	11,372,565	1,876,105	3,535,100	–	31,445,570	3,966,650	2,763,250
1991	18,147,550	10,578,017	2,334,112	3,619,300	–	34,678,979	4,238,800	2,912,823
1992	19,341,530	15,490,000	2,038,285	3,208,834	–	40,078,649	5,207,700	2,816,649
1993	16,292,895	12,848,450	2,143,005	2,788,066	–	34,072,416	4,804,100	2,976,198
1994	15,074,671	11,243,091	2,007,551	2,367,300	–	30,692,613	4,170,100	3,293,227
1995	11,910,151	10,641,491	2,106,069	2,021,900	–	26,679,611	3,636,556	3,260,448
1996	12,573,628	9,481,179	3,274,881	1,676,500	–	27,006,188	3,723,000	3,101,123
1997	10,293,934	11,834,815	3,074,000	1,331,100	–	26,533,849	4,353,800	2,289,687
1998	12,738,158	11,320,000	2,851,000	1,542,900	–	28,452,058	4,069,140	2,592,557
1999	13,875,049	16,970,000	3,382,000	2,599,000	–	36,826,049	5,661,146	2,599,203
2000	12,648,424	21,790,000	3,089,000	3,018,300	–	40,545,724	5,495,225	2,745,798
2001	12,387,857	32,150,000	3,098,000	3,490,245	–	51,126,102	5,507,200	3,383,355
2002	14,431,246	37,574,300	2,927,000	2,329,480	–	57,262,026	6,921,687	3,898,716
2003	15,928,604	22,856,128	2,744,000	2,316,800	–	43,845,532	6,552,194	3,474,483
2004	8,348,714	15,389,407	2,063,000	2,413,400	–	28,214,521	4,421,892	2,992,071
2005	6,940,893	12,925,683	2,397,000	3,051,345	–	25,314,921	3,909,550	3,112,344
2006	5,722,631	14,207,860	2,069,000	2,636,800	–	24,636,291	3,808,680	3,289,376
2007	5,980,671	13,156,658	2,213,000	2,256,600	–	23,606,929	3,641,271	2,986,470
2008	6,401,797	13,086,638	1,903,000	2,617,175	–	24,008,610	3,659,129	2,193,207
2009	8,048,466	14,620,242	2,246,000	2,020,125	–	26,934,833	4,145,781	1,950,114
2010	7,203,286	15,125,067	2,154,000	2,557,970	–	27,040,323	4,023,021	1,469,760
2011	8,522,112	12,172,807	2,205,000	2,258,107	–	25,158,026	3,730,710	1,623,576
2012	9,815,115	20,345,243	2,327,600	1,815,719	–	34,303,677	5,249,680	1,560,586
2013	11,390,593	24,088,150	2,726,938	1,204,799	–	39,410,480	6,039,401	1,716,139
2014	15,330,399	32,803,900	3,222,717	1,841,501	–	53,198,517	8,194,624	1,645,930
2015	17,169,059	27,159,850	3,327,826	1,656,292	–	49,313,027	7,560,091	1,632,098
2016	16,297,628	26,162,000	4,141,007	2,392,800	–	48,993,435	7,490,100	1,442,874
2017	17,458,418	22,566,750	4,711,159	2,489,700	–	47,226,027	7,174,072	1,488,269
2018	14,403,862	22,935,950	5,034,677	3,734,775	–	46,109,264	6,918,174	1,565,140
2019	12,832,394	21,071,900	4,407,116	4,249,560	–	42,560,970	6,222,301	1,570,473
2020	14,022,150	22,287,100	3,356,762	3,090,605	1,378,605	44,135,222	6,032,595	1,229,510
2021	10,452,526	16,663,850	2,828,037	2,412,050	1,911,626	34,268,089	4,464,471	1,344,369
2022	10,913,343	12,959,400	2,836,281	2,399,190	1,858,150	30,966,364	4,383,647	1,266,408
2023	11,882,215	16,267,200	3,884,425	2,156,550	2,363,850	36,554,240	5,132,143	1,361,679
2024	9,634,900	17,727,700	3,910,821	1,695,390	2,363,850	35,332,661	4,979,257	1,317,231
2025	13,910,688	19,948,800	4,922,375	1,304,090	2,078,000	42,163,953	6,311,992	1,522,185

Year	NSW pop.	QLD pop.	SA pop.	WA pop.	VIC pop.	Australia pop.	Australia quota	Australia take
2026	9,586,809	19,308,148	4,129,219	1,500,000	2,306,000	36,830,176	5,191,655	1,369,000
Total							**217,359,735**	**103,853,163**
Joeys							**55,478,909**	**26,500,000**

Notes: Australian population is the sum of state estimates (2002 and 2009 corrected; see Section 4.10). Victoria not included in the commercial program before 2020. 2026 take is an estimate. Joeys row: estimated joeys if the full quota were taken (quota column) and for actual take (take column).

CHAPTER 5

Plausibility Test: Published Kangaroo Population Estimates and Emissions

Commercially exploited kangaroo species, mainland Australia, 1980–2026, with state-by-state analysis 2020–2026 and economic emissions intensity of the trade

Prepared for	Peter Hylands
Date	October 2026
Data	Australian and state government population estimates, commercial quotas and actual take, as compiled in the supplied summary tables. Joey figures are modelled estimates. Tasmania is excluded throughout.

Key findings

If quotas had been fulfilled. If every quota from 2020 had been taken in full, with the same 50% of uncounted losses on top, the reconfigured mainland population would be about **5.8 million** in 2026. On that path South Australia reaches zero in 2026 and New South Wales falls below one million (0.87 million).

The long-run record (1982–2026) cannot be reconciled with the assumptions. Starting from the first mainland estimate (25.4 million in 1982), the take recorded in the 1980s and 1990s plus 50% uncounted losses exceeds what a 10% annual birth rate can replace. Under actual take the reconfigured population is exhausted by **1993**, and under fulfilled quotas by **1991**. To sustain the recorded take through 2026, the 1982 population would have needed to be at least 35.0 million. That is 38% more than was published.

Published year-on-year rises. 14 of the 44 year-on-year changes in the published mainland estimate are rises above 10% (1983, 1986, 1991, 1992, 1999, 2000, 2001, 2002, 2009, 2012, 2013, 2014, 2023, 2025). Under assumption 1 these can only be survey corrections or method changes, not breeding. The published figures would often need a growth rate of 20–60% a year once take and the uncounted losses are added back (Figure 5.4).

Take against quota. From 1980 to 2026 the corrected mainland take was 103.9 million against quotas of 217.5 million (47.8%). Since 2013 it was 23.8%. On top of the take, an estimated **31.2 million joeys** (0.30 × take) and 20.8 million other non-take deaths (0.20 × take) are not in any official figure.

Emissions intensity. Paddock to processor gate, the trade emitted about 34,308 t CO_2-e (Scope 1) in 2026, or 42,771 t including upstream fuel (Scope 1+3). On A$25 per kangaroo that is **1.00 kg CO_2-e per dollar** (Scope 1) and 1.25 kg/$ (Scope 1+3). That is about 5.7 times the intensity of the economy as a whole (0.17 kg/$) and roughly level with agriculture (≈0.97 kg/$). Diesel for the chiller boxes is 93% of the total. Because that cost is fixed, intensity rises as the take falls: from a low of 0.38 kg/$ in 2002 to around 1.0 kg/$ today.

5.1 Data and corrections

Three supplied tables were reconciled:

- **State master table 2020–2026** ("UPDATE MASTER all 2025"). This is the version updated with the 2025 figures, and it is the master for 2020–2026 at state and mainland level.
- **National series 1980–2026** ("1880 to 2026 commercial Kangaroo", compiled from government sources). Used for 1980–2019. The 1980–2000 quota and take match the Australian Government national harvest table once Tasmanian species are removed.
- **Joeys** are not in any official figure. They are modelled as 0.30 × actual take (assumption 3) and always shown in a separate column and total.

Table 5.1. Errors and inconsistencies found, and how they were resolved

Item	Published	Corrected	Note
National series, 2002 population total	57,430,026	57,262,026	State figures add to 57,262,026 (−168,000).
National series, 2009 population total	25,896,505	26,934,833	State figures add to 26,934,833 (+1,038,328).
National series, 1993 population total	34,072416	34,072,416	Typing error (missing separator).
National series, total quota 1980–2026	217,144,450	217,359,735	Re-added using the table's own figures. Final total after the 2020–26 master values is 217,451,571.
National series, total actual take 1980–2026	103,716,933	103,853,163	Re-added using the table's own figures. Final total after the 2020–26 master values is 103,851,716.
National series, joey row	26,500,000	31,155,515	Original ≈ 25.5% of take. Recalculated at 0.30 × corrected take (assumption 3), kept separate.
State master, Total Australia population 2025	42,163,953	42,433,855	Total used SA = 4,922,375. The state row (and SA's 2025 quota report, ≈5.19 million) is 5,192,277.
State master, Total Australia population 2026	36,830,176	36,694,871	WA revised to 1,364,695 but the total still used the earlier 1,500,000 estimate.
State master, per cent column	Truncated	Rounded, 1 d.p.	e.g. NSW 2023 27.5, NSW 2026 37.6, QLD 2024 20.8, WA 2025 40.6, WA 2026 40.7, VIC 2021 64.5; Australia 2021 29.8, 2022 28.6, 2023 26.5.
National series 2020–2026 vs state master	Differs	State master used	e.g. NSW 2020 14,022,150 v 14,158,405; SA population 2020–25; quota 2021 4,464,471 v 4,506,671; 2025 take 1,522,185 (identical). Master values used throughout.
SA 2025 quota (versions differ)	805,800 / 883,500	883,500 (flag)	SA's 2025 quota report lists 805,800 as the sustainable-use quota. The 2025-updated master's 883,500 is kept; please confirm.
1985 mainland take	1,777,249	Unchanged (flag)	Take exceeds quota (1,736,000), i.e. 102.4%. Worth checking against the source.
1980–1981 population; Victoria 1980–2019	–, ?	Not modelled	No mainland estimate before 1982. Victoria not in mainland population until 2020.

Estimated figures (shown in red in the source tables) are marked † in the appendix tables. The 2026 actual takes are the Nature Knowledge Channel forecast, and WA's 2025 take is an estimate.

5.2 Plausibility test method

5.2.1 Assumptions

1. **Maximum reproduction rate: 10% per annum.** No year's population can grow by more than 10% through births. A larger published rise is only plausible as a survey correction or method change.
2. **Additional non-take mortality: +20% of actual take.** Vehicle strikes, drought, disease, predation and non-commercial (illegal or private) culling, modelled as 0.20 × actual take.

3. **Uncounted joey mortality: +30% of actual take.** Pouch young and young-at-foot of shot females, modelled as 0.30 × actual take. Not in any take or quota figure.

5.2.2 The reconfigured population

Each year the highest population the assumptions allow is:

$$\textbf{Maximum plausible}_t = N_{t-1} \times 1.10 - 1.5 \times \text{Take}_{t-1}$$

N_{t-1} is last year's reconfigured population. The 1.5 is the take plus 0.20 plus 0.30. The reconfigured population is then the lower of the published estimate and the maximum plausible:

$$N_t = \min(\text{Published}_t, \text{Maximum plausible}_t)$$

Falls in a published estimate are always accepted, because a survey can always find fewer animals. Rises are capped at what breeding could deliver. Each year's cap builds on the reconfigured figure, not the published one, so an implausible rise cannot become the base for later years. The population cannot go below zero.

Two series. The *actual take* series uses recorded take, which is the basis of the assessment. The *quotas fulfilled* series replaces take with the full commercial quota, with the 20% and 30% add-ons scaled to the quota. It shows what would have happened if every quota had been taken.

Other measures. The *implied growth rate* is the birth rate the published figures would need: (Published_t + 1.5 × Take_{t-1}) ÷ Published_{t-1} − 1. The *theoretical ceiling* grows the base year at 10% with the losses taken off, ignoring every survey decline, so it is an upper bound. The *break-even population* is the population at which 10% growth just replaces the year's losses: 15 × take. For 2026 that is **20.5 million**.

Base years. The mainland test starts at 1982, the first year with a mainland estimate. Quota and take for 1980–1981 are reported and totalled, and drive the emissions series, but cannot drive the population model. The state test, and the 2026 estimate, start at 2020, the first year of the state tables. In each case the published estimate is the population at the start of the year, and the take is during it.

5.3 Mainland Australia, 1980–2026

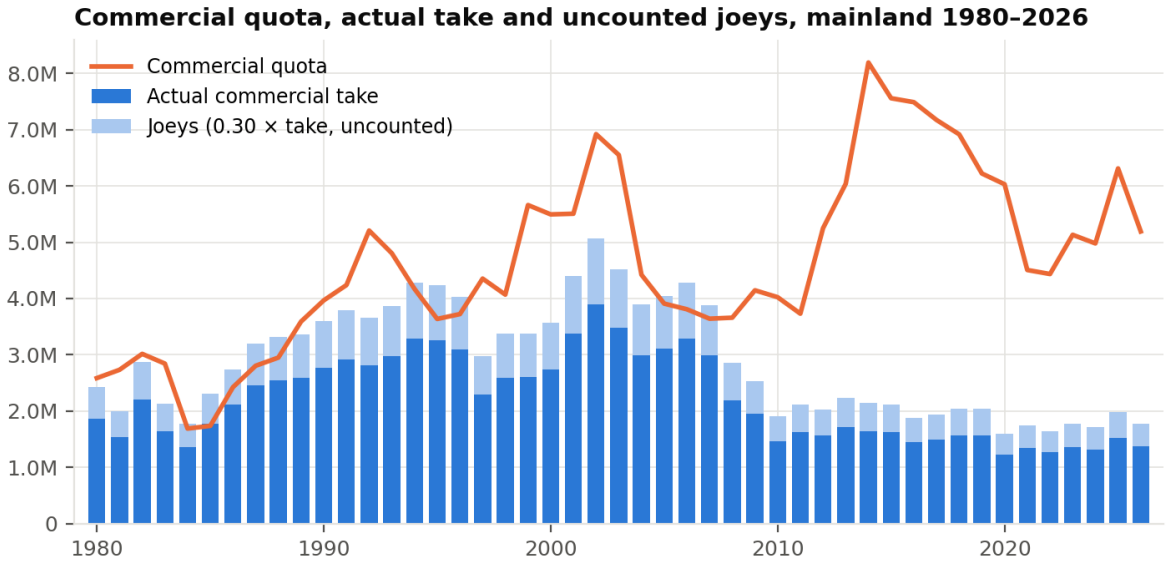


Figure 5.1. Commercial quota, actual take and uncounted joeys (0.30 × take), mainland, 1980–2026.

Take peaked at 3.9 million in 2002 and has been between 1.2 and 1.6 million a year since 2010. Quotas have moved away from the take since 2012, peaking at 8.2 million in 2014, while take has stayed flat. Only 23.8% of quota has been used since 2013.

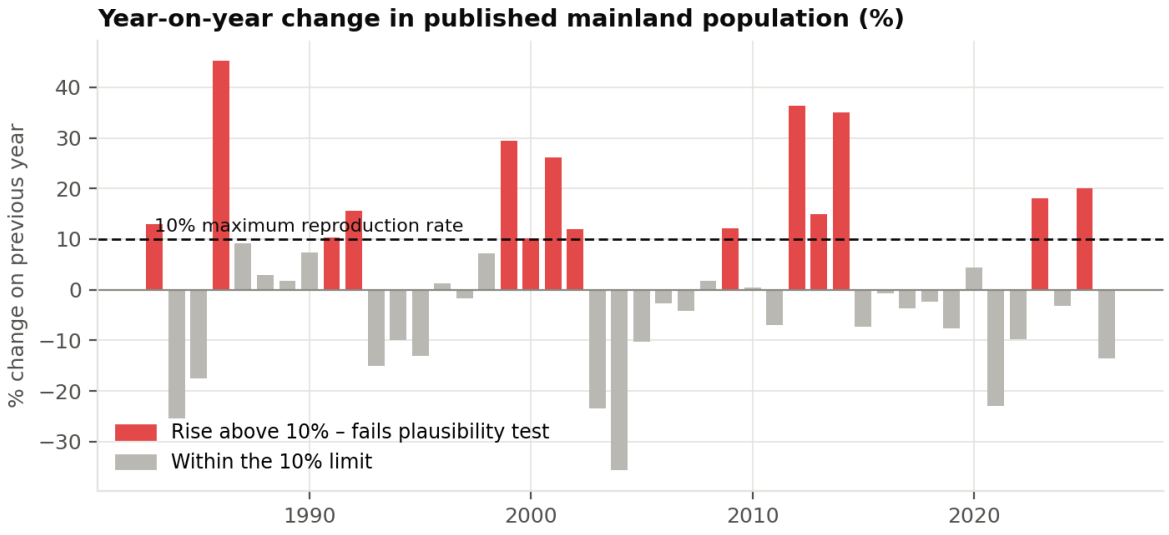


Figure 5.2. Year-on-year change in the published mainland population. Red bars are rises above the 10% maximum reproduction rate.

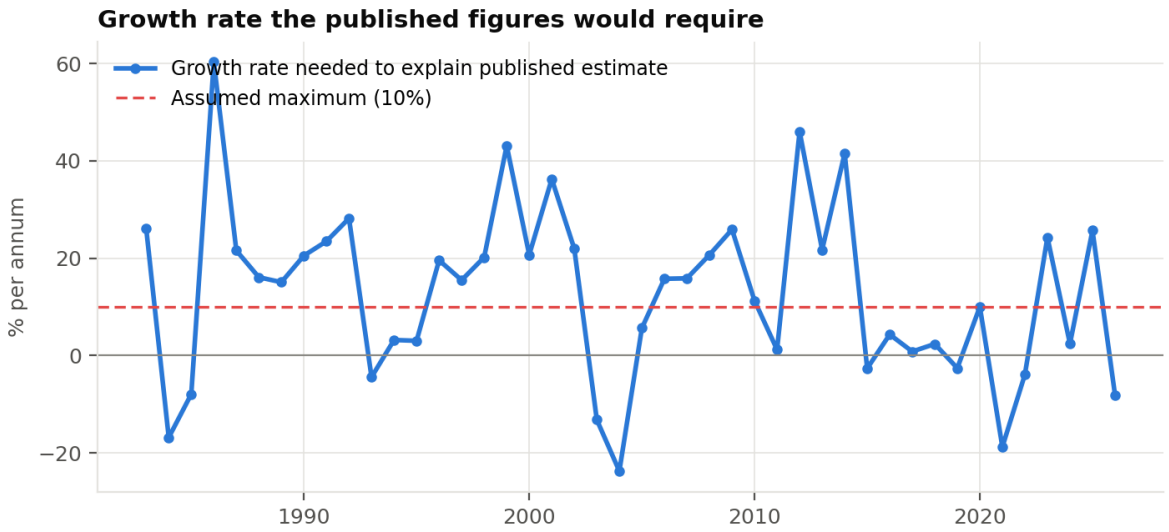


Figure 5.3. Growth rate the published estimates would need, once actual take and the 50% uncounted losses are added back.

Some of the largest rises (1986 +45%, 1999 +29%, 2001 +26%, 2012 +36%, 2014 +35%) coincide with periods when survey areas, species or methods are known to have changed. Assumption 1 allows a rise from that cause. They are still not population growth, and if accepted at face value they set the base for quotas in the years that follow.

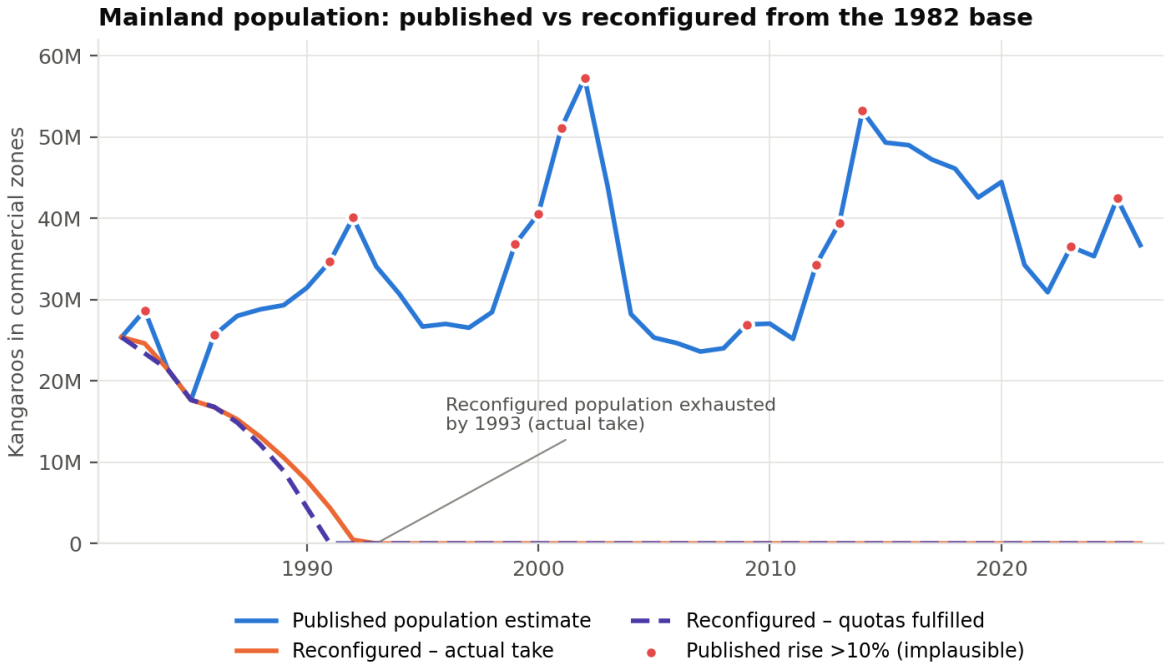


Figure 5.4. Published mainland population and the reconfigured population from the 1982 base, under actual take and fulfilled quotas.

Starting from 25.4 million in 1982, the takes of the 1980s (1.4–2.6 million a year) mean losses of 2.0–3.9 million a year once the 50% is added. Growth of at most 10% replaces only 1.7–2.5 million. The reconfigured population falls every year and is exhausted by **1993** under actual take (1991 under fulfilled quotas). With no caps at all, the theoretical projection is exhausted by 1997. For the recorded

take to be supported through 2026, the 1982 population would have needed to be at least 35.0 million (52.6 million if quotas had been taken in full).

Interpretation. Kangaroos were obviously not wiped out by 1993, so at least one part of the long-run record fails the test. Either the early survey estimates were well below the real population, or the losses were smaller than assumed, or the population grew faster than 10% in good seasons. On the last point, the ecological literature reports maximum rates of increase above 10% for some species in favourable years. The test does not decide which explanation is right. It shows the published series and the recorded take cannot all hold together under the stated assumptions. This is why the 2026 estimate below rests on the shorter, internally consistent 2020–2026 state data, not on a 44-year chain.

Table 5.2. Mainland reconfigured population, 1982 base (actual take and fulfilled quotas), first decade

Year	Published	Change %	Max plausible	Reconfigured – actual take	Reconfigured – quotas fulfilled
1982	25,377,006	–	–	25,377,006	25,377,006
1983	28,682,674	13.0	24,604,139	24,604,139	23,390,707
1984	21,394,731	-25.4	29,097,249	21,394,731	21,394,731
1985	17,652,271	-17.5	21,490,990	17,652,271	17,652,271
1986	25,634,603	45.2	16,751,625	16,751,625	16,813,498
1987	27,994,194	9.2	25,030,159	15,258,883	14,859,448
1988	28,802,067	2.9	27,102,868	13,094,026	12,138,793
1989	29,309,811	1.8	27,853,752	10,574,906	8,927,972
1990	31,445,570	7.3	28,362,808	7,754,413	4,435,919
1991	34,678,979	10.3	30,445,252	4,384,979	0
1992	40,078,649	15.6	33,777,642	454,242	0
1993	34,072,416	-15.0	39,861,540	0	0
1994	30,692,613	-9.9	33,015,361	0	0

From 1993 both reconfigured series are zero. The full series is in Appendix B.

5.4 States and mainland, 2020–2026

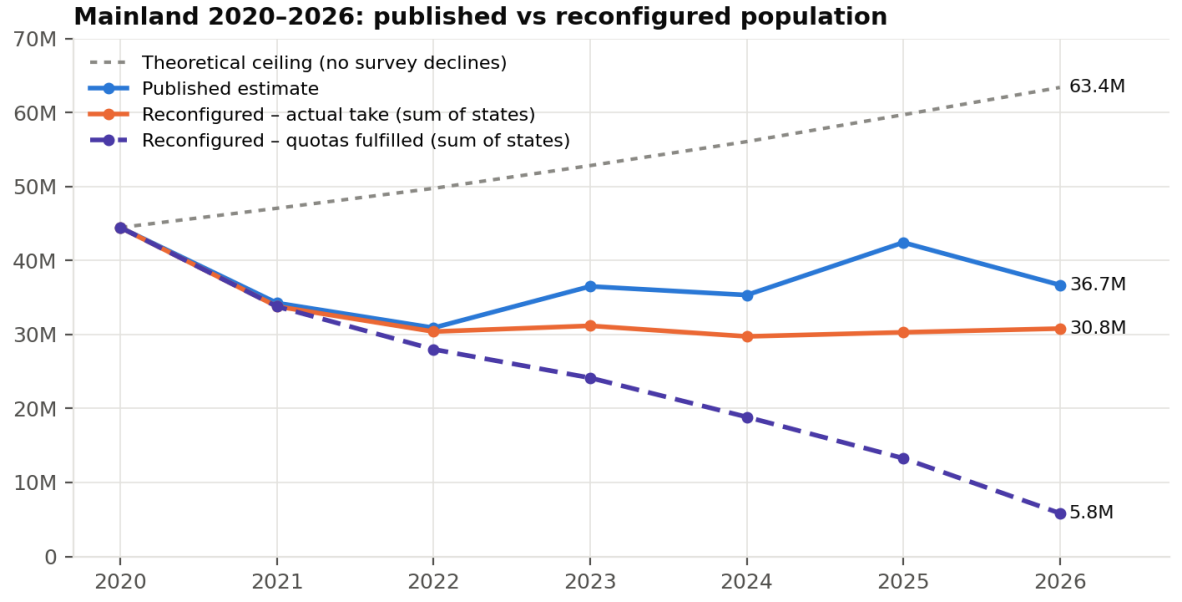


Figure 5.5. Mainland 2020–2026: published estimate, reconfigured population (sum of states) under actual take and fulfilled quotas, and the theoretical ceiling.

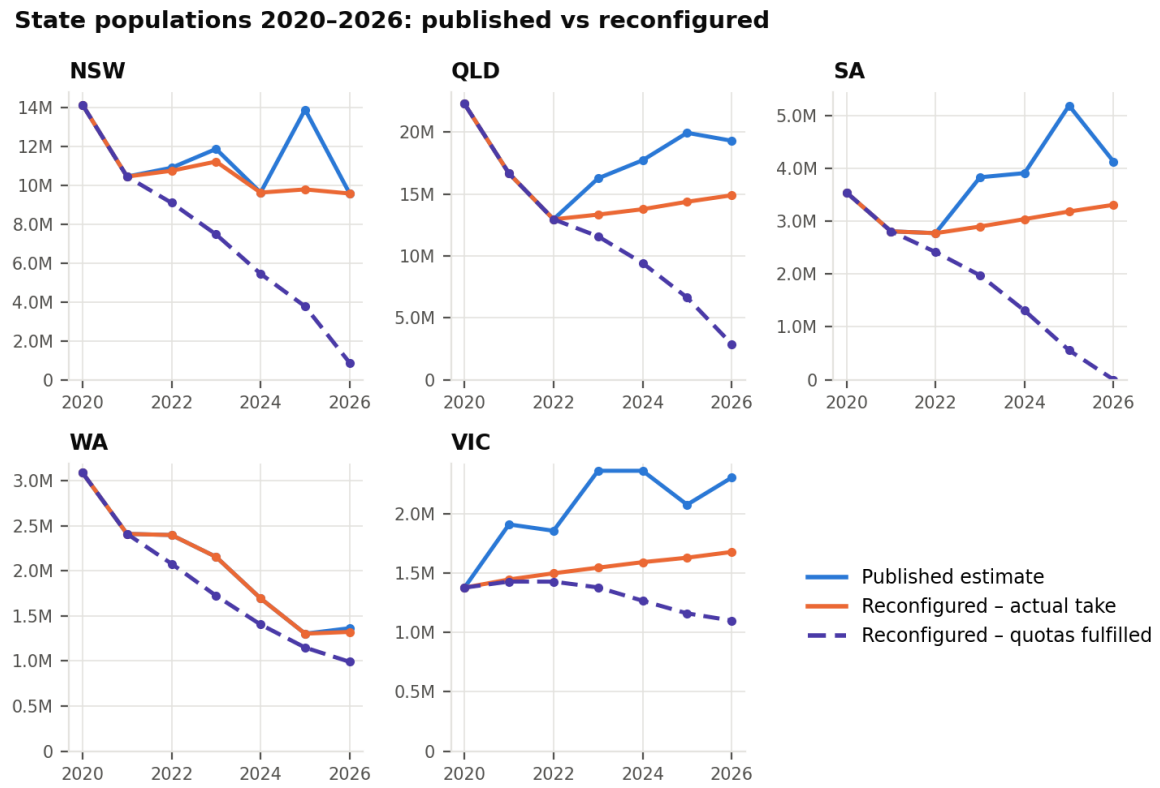


Figure 5.6. Published and reconfigured populations by state, 2020–2026.

Table 5.3. 2026 population by state: published, reconfigured and theoretical ceiling

State	Published 2026	Reconfigured – actual take	Difference %	Reconfigured – quotas fulfilled	Theoretical ceiling	Break-even population
NSW	9,586,809	9,586,809	0.0	868,986	19,298,226	8,205,000
QLD	19,308,148	14,899,058	-22.8	2,885,640	32,845,683	8,520,000
SA	4,129,219	3,312,265	-19.8	0	5,078,149	1,545,000
WA	1,364,695	1,323,499	-3.0	991,208	4,487,080	1,170,000
VIC	2,306,000	1,679,433	-27.2	1,101,156	1,679,433	1,095,000
Mainland (sum of states)	**36,694,871**	**30,801,063**	**-16.1**	**5,846,991**	**63,388,570**	**20,535,000**
Mainland (aggregate test)	36,694,871	35,791,663	-2.5	9,394,881	63,388,570	20,535,000

Theoretical ceiling: the 2020 estimate grown at 10% a year less 1.5 × take, with no survey declines. Break-even: 15 × 2026 take.

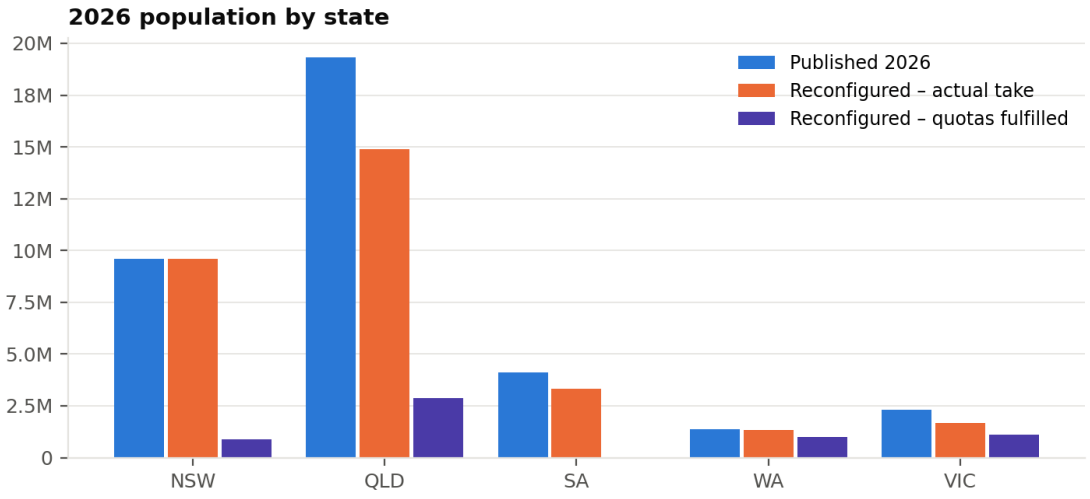


Figure 5.7. 2026 population by state.

5.4.1 State results

- **Queensland.** Published estimates rose from 13.0 million in 2022 to 19.3 million in 2026, a gain of 49% while 2.9 million were taken. The cap allows 14.9 million, so 4.4 million of the published figure fails the test. Queensland is the largest single source of the mainland gap.
- **New South Wales.** The 2025 jump to 13.9 million (+44%) is implausible. The 2026 published figure (9.6 million) is within the cap. Under fulfilled quotas NSW would have fallen to 0.87 million.
- **South Australia.** The rises in 2023 (+38%) and 2025 (+33%) fail the test. Reconfigured 2026 is 3.3 million against 4.1 million published. Under fulfilled quotas the population reaches zero in 2026. SA's figures include Kangaroo Island Tammar wallaby (≈385,000 in the 2025 quota report), which has had no commercial take.
- **Western Australia.** Published estimates fell 58% between 2020 and 2025, which is plausible as a decline. The 2026 rise to 1.4 million is close to the cap (1.3 million).
- **Victoria.** Victoria takes the largest share of its quota (43–80%). Its 2021 (+39%) and 2023 (+27%) rises fail the test. Reconfigured 2026 is 1.7 million against 2.3 million published (−27%), the largest proportional gap of any state.

5.5 Greenhouse gas emissions

5.5.1 Economic emissions intensity

Economic emissions intensity (EEI) is the greenhouse gas emitted per unit of economic output:

$$\textbf{EEI (kg } CO_2\textbf{-e per \$) = Total emissions (kg } CO_2\textbf{-e) ÷ Output value (\$, CVM)}$$

For the kangaroo trade, output each year is the actual commercial take × A$25, the assumed chain volume measure (constant-price) value of a kangaroo delivered to the processor. Joeys are excluded from output and emissions.

5.5.2 Why chain volume measures

Chain volume measures remove the effect of price change, so movements over time reflect real volume only. The ABS publishes national accounts CVMs with 2023–24 as the reference year. In the reference

year CVM values equal current-price values. A$25 per kangaroo is therefore a 2023–24 price held constant for every year from 1980 to 2026, and the comparator industries are measured in 2023–24 values. Because the price is constant, all year-to-year change in intensity comes from physical activity (the size of the take relative to fixed overheads), not from inflation.

5.5.3 Boundary and activity data

The boundary is "paddock to processor gate", where the A$25 value is struck. Included activities, as specified in the brief:

Table 5.4. Activity data and fuel assumptions

Activity	Brief specification	Fuel-use assumption	Annual fuel (2026)
Shooter vehicles	100 km return trip per load of 25 kangaroos; Toyota HiLux / Isuzu D-MAX single-cab diesel ute	10 L/100 km (real-world, loaded, off-road; ADR combined ≈ 8.0–8.4)	547,600 L diesel
Chiller boxes	900 shipping-container chillers, 24 h a day on diesel	1.5 L/h per unit (reefer diesel genset at chilled set-point)	11,826,000 L diesel
Compliance checks	20,000 km a year, same vehicle type	10 L/100 km	2,000 L diesel
Population surveys – fixed wing	1,000 flying hours, Cessna 206	55 L/h aviation gasoline	55,000 L avgas
Population surveys – helicopter	1,000 flying hours, medium helicopter	250 L/h aviation turbine fuel	250,000 L avtur

Chillers, compliance and surveys are fixed overheads, held constant for every year from 1980 to 2026 as the brief specifies. Shooter-vehicle fuel scales with take.

Excluded: joeys, processing, cold-chain transport after the processor gate, refrigerant (HFC) leakage from chillers, vehicle and equipment manufacture, and firearms and ammunition.

5.5.4 Emission factors

The primary measure counts direct combustion emissions (Scope 1), the same basis the national inventory uses for the comparator industries. The secondary measure adds the upstream emissions (Scope 3) of extracting, refining and delivering the fuels. Factors are from the Australian National Greenhouse Accounts (NGA) Factors 2025.

Table 5.5. Emission factors used (NGA Factors 2025)

Fuel	Energy content (GJ/kL)	Scope 1 (kg CO_2-e/GJ)	Scope 1 (kg CO_2-e/L)	Scope 3 (kg CO_2-e/GJ)	Scope 3 (kg CO_2-e/L)
Diesel – transport (utes)	38.6	70.41	2.718	17.3	0.668
Diesel – stationary (chillers)	38.6	70.20	2.710	17.3	0.668
Aviation gasoline	33.1	67.66	2.240	18.0	0.596
Aviation turbine fuel	36.8	70.21	2.584	18.0	0.662

5.5.5 Results

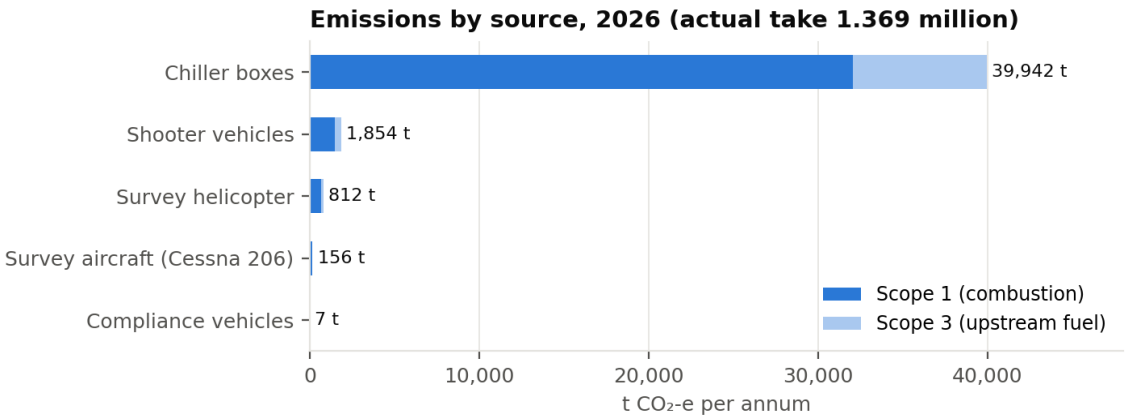


Figure 5.8. Emissions by source in 2026, Scope 1 and upstream Scope 3.

Table 5.6. Emissions inventory, 2026 (actual take 1,369,000; output A$34.2 million)

Source	Fuel (litres)	Scope 1 (t CO_2-e)	Scope 3 (t CO_2-e)	Scope 1+3 (t CO_2-e)	Share of Scope 1
Shooter vehicles	547,600	1,488	366	1,854	4.3%
Chiller boxes	11,826,000	32,045	7,897	39,942	93.4%
Compliance vehicles	2,000	5	1	7	0.0%
Survey aircraft (Cessna 206)	55,000	123	33	156	0.4%
Survey helicopter	250,000	646	166	812	1.9%
Total		**34,308**	**8,463**	**42,771**	**100.0%**

EEI 2026 = 34,307,973 kg ÷ A$34,225,000 =

1.00 kg CO_2-e per $ (Scope 1); 1.25 kg CO_2-e per $ (Scope 1+3). That is 25.1 kg CO_2-e per kangaroo delivered (31.2 kg including Scope 3).

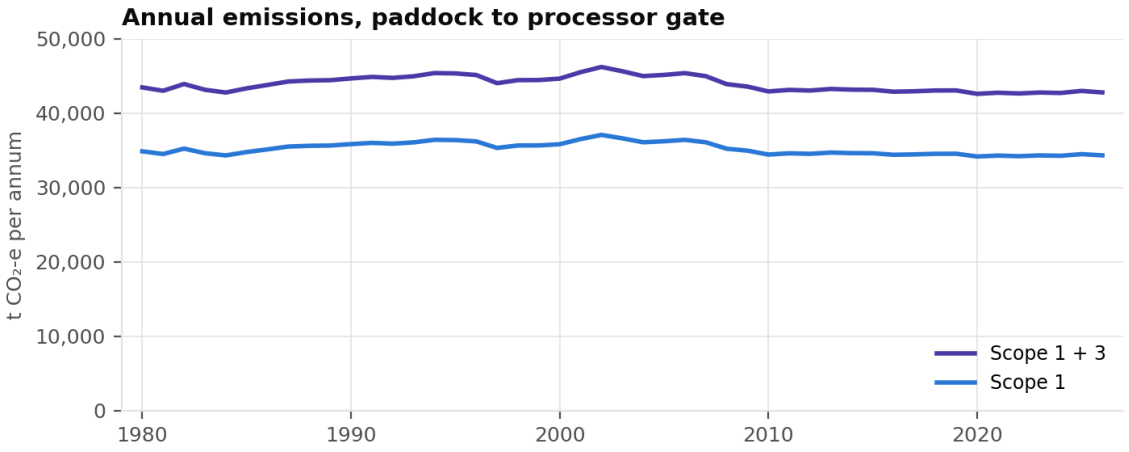


Figure 5.9. Annual emissions of the trade, 1980–2026.

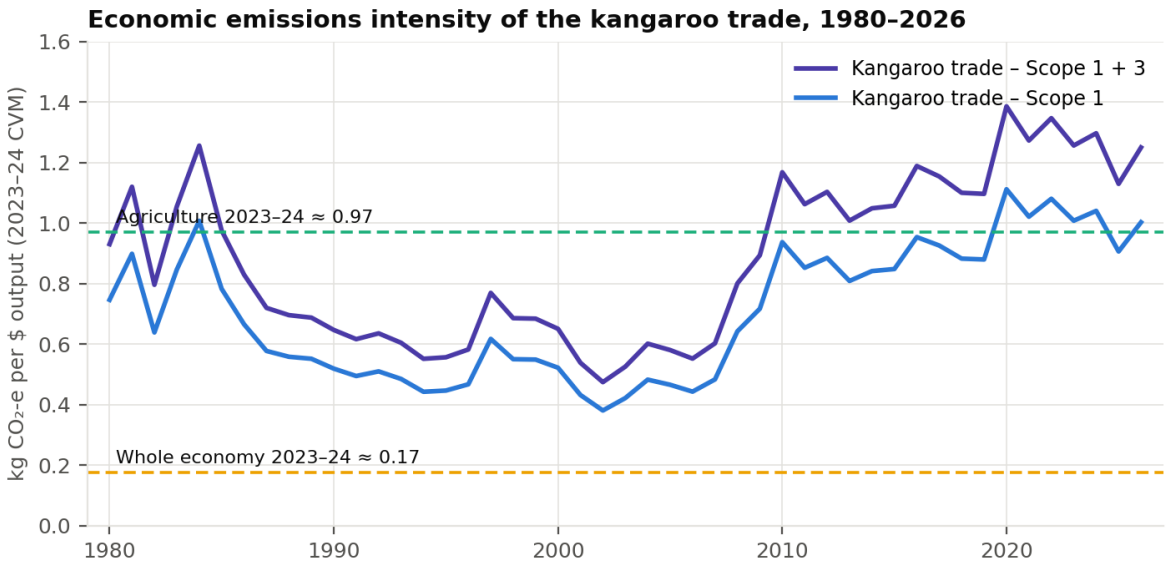


Figure 5.10. Economic emissions intensity 1980–2026, with 2023–24 comparators.

Total emissions barely move (≈34,000–37,000 t Scope 1), because the fixed chiller fleet dominates. Intensity is therefore driven by the take. It fell to 0.38 kg/$ at the 2002 peak take of 3.9 million, and has risen to around 1.0 kg/$ as take has fallen to 1.2–1.5 million. Every dollar of kangaroo output now carries roughly twice the emissions it did in the early 2000s. Cumulative emissions 1980–2026 are about 1,655 thousand t Scope 1 (2,064 thousand t Scope 1+3).

Table 5.7. Comparator industries, 2023–24 (reference-year CVM)

Comparator	EEI (kg CO_2-e per $)	Basis
Whole Australian economy	0.17	NIR 2024 net emissions 466.4 Mt; GDP 2023-24 approx. A$2.67 trillion (ABS, reference year CVM = current prices)
Agriculture (farm-gate)	0.97	Agriculture sector approx. 80 Mt (national inventory, 2023-24, indicative); ABARES GVP 2023-24 A$82.5 billion
Kangaroo trade 2023-24 (Scope 1, this study)	1.02	Average of 2023 and 2024 calendar years
Kangaroo trade 2023-24 (Scope 1+3, this study)	1.28	Average of 2023 and 2024 calendar years

Comparator figures are indicative and were not re-verified against the inventory data tables, because the Australian Government site could not be reached while preparing this report. Agriculture's ≈80 Mt includes enteric methane and other non-combustion sources, so it is broader than the kangaroo boundary. The whole-economy figure divides net national emissions by GDP. Please confirm both against the National Inventory by Economic Sector 2023–24 before publishing.

Table 5.8. Sensitivity of 2026 intensity to the key fuel assumptions

Case	Scope 1 (t CO_2-e)	EEI Scope 1 (kg/$)	EEI Scope 1+3 (kg/$)
Central case	34,308	1.00	1.25
Chiller fuel 1.0 L/h	23,626	0.69	0.86
Chiller fuel 2.5 L/h	55,671	1.63	2.03
Ute 8.4 L/100 km (ADR combined)	34,069	1.00	1.24
Ute 13 L/100 km (heavy off-road)	34,756	1.02	1.27
Helicopter 180 L/h (light-medium)	34,127	1.00	1.24
Helicopter 400 L/h (medium twin)	34,696	1.01	1.26

The result depends mostly on the chiller assumption. Between 1.0 and 2.5 L/h per chiller, 2026 intensity ranges from 0.69 to 1.63 kg/$. The vehicle and aircraft assumptions move it by less than ±2%.

5.5.6 State emissions

Shooter-vehicle emissions follow each state's take. Chillers and compliance driving are fixed infrastructure, shared out by each state's average share of take over 2020–2026 (NSW 38.2%, QLD 42.7%, SA 7.8%, WA 6.2%, VIC 5.1%). Survey flying is shared by each year's population-estimate share. State figures add to the mainland total each year. State intensity rises when a state's take falls below its usual share, as in NSW 2022 and WA 2025.

Table 5.9. Emissions and intensity by state, 2020–2026

State / year	Actual take	Output A$ (CVM)	Scope 1 t CO_2-e	Scope 1+3 t CO_2-e	EEI S1 kg/$	EEI S1+3 kg/$
NSW 2020	469,186	11,729,650	12,992	16,196	1.11	1.38
NSW 2021	497,285	12,432,125	13,012	16,222	1.05	1.30
NSW 2022	402,719	10,067,975	12,946	16,140	1.29	1.60
NSW 2023	509,671	12,741,775	13,041	16,258	1.02	1.28
NSW 2024	532,415	13,310,375	13,026	16,238	0.98	1.22
NSW 2025	634,087	15,852,175	13,178	16,429	0.83	1.04
NSW 2026	547,000 †	13,675,000	13,033	16,246	0.95	1.19
QLD 2020	514,144	12,853,600	14,638	18,250	1.14	1.42
QLD 2021	601,164	15,029,100	14,721	18,353	0.98	1.22
QLD 2022	612,233	15,305,825	14,682	18,303	0.96	1.20
QLD 2023	597,750	14,943,750	14,686	18,309	0.98	1.23
QLD 2024	516,847	12,921,175	14,641	18,254	1.13	1.41
QLD 2025	609,842	15,246,050	14,718	18,349	0.97	1.20
QLD 2026	568,000 †	14,200,000	14,716	18,347	1.04	1.29
SA 2020	98,962	2,474,050	2,672	3,331	1.08	1.35
SA 2021	97,389	2,434,725	2,672	3,331	1.10	1.37
SA 2022	100,896	2,522,400	2,682	3,343	1.06	1.33
SA 2023	100,088	2,502,200	2,692	3,357	1.08	1.34
SA 2024	106,503	2,662,575	2,704	3,371	1.02	1.27
SA 2025	127,903	3,197,575	2,736	3,411	0.86	1.07
SA 2026	103,000 †	2,575,000	2,701	3,368	1.05	1.31
WA 2020	100,893	2,522,325	2,149	2,679	0.85	1.06
WA 2021	85,613	2,140,325	2,133	2,659	1.00	1.24
WA 2022	82,214	2,055,350	2,135	2,662	1.04	1.29
WA 2023	81,938	2,048,450	2,120	2,643	1.04	1.29
WA 2024	80,306	2,007,650	2,110	2,630	1.05	1.31
WA 2025	74,000 †	1,850,000	2,090	2,605	1.13	1.41
WA 2026	78,000 †	1,950,000	2,099	2,617	1.08	1.34
VIC 2020	46,064	1,151,600	1,705	2,126	1.48	1.85
VIC 2021	61,732	1,543,300	1,741	2,171	1.13	1.41
VIC 2022	68,346	1,708,650	1,752	2,184	1.03	1.28
VIC 2023	72,232	1,805,800	1,760	2,194	0.97	1.21
VIC 2024	81,160	2,029,000	1,771	2,208	0.87	1.09
VIC 2025	76,353	1,908,825	1,752	2,184	0.92	1.14
VIC 2026	73,000 †	1,825,000	1,759	2,193	0.96	1.20

5.6 Limitations

- The three assumptions are those set in the brief. A 10% cap is strict: in good seasons some species can increase faster. Read the reconfigured population as what the assumptions allow, not as a census.

- Applying 1.5 × take every year assumes the 20% and 30% losses happen in every year and every state. In practice drought mortality varies a lot from year to year.
- Harvest zones, survey areas and the species covered have changed over time (for example, Tammar wallaby in SA, and Victoria from 2020). Some published jumps are partly changes in coverage. Under assumption 1 those are corrections, not growth.
- Takes for 2026 and some 2025 figures are estimates (marked †), and the WA 2026 population and quota are provisional.
- Emissions use the activity levels set in the brief and are held constant from 1980. The chiller fuel rate is the main uncertainty (Table 5.8).

Appendix A. State summary table 2020–2026 with added columns

Corrected figures with totals added. Joeys (0.30 × take) are kept separate from the official take and are not in any government figure. Populations are not added across years, because they are stock figures rather than flows. † = estimate.

Table 5.10. Corrected state summary table, 2020–2026, with added columns

State	Year	Population estimate	Quota	Actual take	Take % of quota	Joeys (0.30 × take)	Other non-take deaths (0.20 × take)	Scope 1 t CO_2-e	Scope 1+3 t CO_2-e	EEI S1 kg/$	EEI S1+3 kg/$
NSW	2020	14,158,405	2,126,176	469,186	22.1	140,756	93,837	12,992	16,196	1.11	1.38
NSW	2021	10,459,983	1,598,761	497,285	31.1	149,186	99,457	13,012	16,222	1.05	1.30
NSW	2022	10,913,343	1,692,207	402,719	23.8	120,816	80,544	12,946	16,140	1.29	1.60
NSW	2023	11,882,215	1,850,228	509,671	27.5	152,901	101,934	13,041	16,258	1.02	1.28
NSW	2024	9,634,900	1,484,072	532,415	35.9	159,725	106,483	13,026	16,238	0.98	1.22
NSW	2025	13,910,688	2,186,952	634,087	29.0	190,226	126,817	13,178	16,429	0.83	1.04
NSW	2026	9,586,809	1,453,025	547,000 †	37.6	164,100	109,400	13,033	16,246	0.95	1.19
NSW	**Total 2020–26**	**n/a**	**12,391,421**	**3,592,363**	**29.0**	**1,077,709**	**718,473**	**91,229**	**113,728**	**1.02**	**1.27**
QLD	2020	22,287,000	2,825,150	514,144	18.2	154,243	102,829	14,638	18,250	1.14	1.42
QLD	2021	16,663,850	1,981,150	601,164	30.3	180,349	120,233	14,721	18,353	0.98	1.22
QLD	2022	12,959,400	1,783,850	612,233	34.3	183,670	122,447	14,682	18,303	0.96	1.20
QLD	2023	16,267,200	2,210,400	597,750	27.0	179,325	119,550	14,686	18,309	0.98	1.23
QLD	2024	17,727,700	2,486,400	516,847	20.8	155,054	103,369	14,641	18,254	1.13	1.41
QLD	2025	19,948,800	2,941,550	609,842	20.7	182,953	121,968	14,718	18,349	0.97	1.20
QLD	2026	19,308,148	2,850,900	568,000 †	19.9	170,400	113,600	14,716	18,347	1.04	1.29
QLD	**Total 2020–26**	**n/a**	**17,079,400**	**4,019,980**	**23.5**	**1,205,994**	**803,996**	**102,803**	**128,164**	**1.02**	**1.28**
SA	2020	3,545,902	532,400	98,962	18.6	29,689	19,792	2,672	3,331	1.08	1.35
SA	2021	2,810,547	449,200	97,389	21.7	29,217	19,478	2,672	3,331	1.10	1.37
SA	2022	2,775,048	455,800	100,896	22.1	30,269	20,179	2,682	3,343	1.06	1.33
SA	2023	3,833,889	576,300	100,088	17.4	30,026	20,018	2,692	3,357	1.08	1.34
SA	2024	3,912,711	589,200	106,503	18.1	31,951	21,301	2,704	3,371	1.02	1.27
SA	2025	5,192,277	883,500	127,903	14.5	38,371	25,581	2,736	3,411	0.86	1.07
SA	2026	4,129,219	600,400	103,000 †	17.2	30,900	20,600	2,701	3,368	1.05	1.31
SA	**Total 2020–26**	**n/a**	**4,086,800**	**734,741**	**18.0**	**220,422**	**146,948**	**18,859**	**23,512**	**1.03**	**1.28**
WA	2020	3,090,605	489,130	100,893	20.6	30,268	20,179	2,149	2,679	0.85	1.06
WA	2021	2,412,050	381,880	85,613	22.4	25,684	17,123	2,133	2,659	1.00	1.24
WA	2022	2,399,190	375,410	82,214	21.9	24,664	16,443	2,135	2,662	1.04	1.29

State	Year	Population estimate	Quota	Actual take	Take % of quota	Joeys (0.30 × take)	Other non-take deaths (0.20 × take)	Scope 1 t CO_2-e	Scope 1+3 t CO_2-e	EEI S1 kg/$	EEI S1+3 kg/$
WA	2023	2,156,550	328,470	81,938	24.9	24,581	16,388	2,120	2,643	1.04	1.29
WA	2024	1,695,390	263,935	80,306	30.4	24,092	16,061	2,110	2,630	1.05	1.31
WA	2025	1,304,090	182,390	74,000 †	40.6	22,200	14,800	2,090	2,605	1.13	1.41
WA	2026	1,364,695	191,880	78,000 †	40.7	23,400	15,600	2,099	2,617	1.08	1.34
WA	**Total 2020–26**	**n/a**	**2,213,095**	**582,964**	**26.3**	**174,889**	**116,593**	**14,836**	**18,496**	**1.02**	**1.27**
VIC	2020	1,378,605	57,900	46,064	79.6	13,819	9,213	1,705	2,126	1.48	1.85
VIC	2021	1,911,550	95,680	61,732	64.5	18,520	12,346	1,741	2,171	1.13	1.41
VIC	2022	1,858,150	127,850	68,346	53.5	20,504	13,669	1,752	2,184	1.03	1.28
VIC	2023	2,363,850	166,750	72,232	43.3	21,670	14,446	1,760	2,194	0.97	1.21
VIC	2024	2,363,850	155,650	81,160	52.1	24,348	16,232	1,771	2,208	0.87	1.09
VIC	2025	2,078,000	117,600	76,353	64.9	22,906	15,271	1,752	2,184	0.92	1.14
VIC	2026	2,306,000	95,450	73,000 †	76.5	21,900	14,600	1,759	2,193	0.96	1.20
VIC	**Total 2020–26**	**n/a**	**816,880**	**478,887**	**58.6**	**143,666**	**95,777**	**12,240**	**15,259**	**1.02**	**1.27**
Australia	2020	44,460,517	6,030,756	1,229,249	20.4	368,775	245,850	34,156	42,581	1.11	1.39
Australia	2021	34,257,980	4,506,671	1,343,183	29.8	402,955	268,637	34,280	42,736	1.02	1.27
Australia	2022	30,905,131	4,435,117	1,266,408	28.6	379,922	253,282	34,196	42,632	1.08	1.35
Australia	2023	36,503,704	5,132,148	1,361,679	26.5	408,504	272,336	34,300	42,761	1.01	1.26
Australia	2024	35,334,551	4,979,257	1,317,231	26.5	395,169	263,446	34,252	42,700	1.04	1.30
Australia	2025	42,433,855	6,311,992	1,522,185 †	24.1	456,656	304,437	34,475	42,978	0.91	1.13
Australia	2026	36,694,871	5,191,655	1,369,000 †	26.4	410,700	273,800	34,308	42,771	1.00	1.25
Australia	**Total 2020–26**	**n/a**	**36,587,596**	**9,408,935**	**25.7**	**2,822,681**	**1,881,787**	**239,967**	**299,158**	**1.02**	**1.27**

Appendix B. Mainland series 1980–2026 with plausibility test and emissions

1980–2019 from the national series (corrected); 2020–2026 from the state master. The mainland population is the sum of the state estimates. Reconfigured populations start from the 1982 base. Red shading = published rise above 10%.

Table 5.11. Mainland series 1980–2026, corrected, with plausibility test and emissions

Year	NSW	QLD	SA	WA	VIC	Mainland population	Change %	Implied growth %	Reconfigured – actual	Reconfigured – quotas	Quota	Actual take	Take %	Joeys (0.30)	S1 t CO_2-e	S1+3 t CO_2-e	EEI S1	EEI S1+3
1980	–	–	–	–	–	–	–	–	–	–	2,585,000	1,868,534	72.3	560,560	34,851	43,447	0.75	0.93
1981	–	–	–	–	–	–	–	–	–	–	2,732,500	1,535,967	56.2	460,790	34,489	42,997	0.90	1.12
1982	10,724,400	10,258,111	2,831,595	1,562,900	–	25,377,006	–	–	25,377,006	25,377,006	3,016,000	2,207,045	73.2	662,114	35,219	43,905	0.64	0.80

Year	NSW	QLD	SA	WA	VIC	Mainland population	Change %	Implied growth %	Reconfigured – actual	Reconfigured – quotas	Quota	Actual take	Take %	Joeys (0.30)	S1 t CO_2-e	S1+3 t CO_2-e	EEI S1	EEI S1+3
1983	15,024,000	9,810,534	1,984,440	1,863,700	–	28,682,674	13.0	26.1	24,604,139	23,390,707	2,843,000	1,635,795	57.5	490,739	34,598	43,132	0.85	1.05
1984	8,692,000	9,362,957	1,175,274	2,164,500	–	21,394,731	-25.4	-16.9	21,394,731	21,394,731	1,688,000	1,362,143	80.7	408,643	34,301	42,761	1.01	1.26
1985	5,299,200	8,915,381	972,390	2,465,300	–	17,652,271	-17.5	-7.9	17,652,271	17,652,271	1,736,000	1,777,249	102.4	533,175	34,752	43,323	0.78	0.98
1986	8,178,490	13,177,659	1,519,554	2,758,900	–	25,634,603	45.2	60.3	16,751,625	16,813,498	2,423,600	2,111,936	87.1	633,581	35,116	43,777	0.67	0.83
1987	9,251,712	14,161,070	1,528,912	3,052,500	–	27,994,194	9.2	21.6	15,258,883	14,859,448	2,804,400	2,460,497	87.7	738,149	35,495	44,249	0.58	0.72
1988	10,918,210	13,164,580	1,373,177	3,346,100	–	28,802,067	2.9	16.1	13,094,026	12,138,793	2,949,800	2,552,348	86.5	765,704	35,594	44,373	0.56	0.70
1989	10,497,580	13,454,557	1,917,074	3,440,600	–	29,309,811	1.8	15.1	10,574,906	8,927,972	3,589,900	2,585,323	72.0	775,597	35,630	44,418	0.55	0.69
1990	14,661,800	11,372,565	1,876,105	3,535,100	–	31,445,570	7.3	20.5	7,754,413	4,435,919	3,966,650	2,763,250	69.7	828,975	35,824	44,659	0.52	0.65
1991	18,147,550	10,578,017	2,334,112	3,619,300	–	34,678,979	10.3	23.5	4,384,979	0	4,238,800	2,912,823	68.7	873,847	35,986	44,861	0.49	0.62
1992	19,341,530	15,490,000	2,038,285	3,208,834	–	40,078,649	15.6	28.2	454,242	0	5,207,700	2,816,649	54.1	844,995	35,882	44,731	0.51	0.64
1993	16,292,895	12,848,450	2,143,005	2,788,066	–	34,072,416	-15.0	-4.4	0	0	4,804,100	2,976,198	62.0	892,859	36,055	44,947	0.48	0.60
1994	15,074,671	11,243,091	2,007,551	2,367,300	–	30,692,613	-9.9	3.2	0	0	4,170,100	3,293,227	79.0	987,968	36,400	45,376	0.44	0.55
1995	11,910,151	10,641,491	2,106,069	2,021,900	–	26,679,611	-13.1	3.0	0	0	3,636,556	3,260,448	89.7	978,134	36,364	45,332	0.45	0.56
1996	12,573,628	9,481,179	3,274,881	1,676,500	–	27,006,188	1.2	19.6	0	0	3,723,000	3,101,123	83.3	930,337	36,191	45,116	0.47	0.58
1997	10,293,934	11,834,815	3,074,000	1,331,100	–	26,533,849	-1.7	15.5	0	0	4,353,800	2,289,687	52.6	686,906	35,309	44,017	0.62	0.77
1998	12,738,158	11,320,000	2,851,000	1,542,900	–	28,452,058	7.2	20.2	0	0	4,069,140	2,592,557	63.7	777,767	35,638	44,428	0.55	0.69
1999	13,875,049	16,970,000	3,382,000	2,599,000	–	36,826,049	29.4	43.1	0	0	5,661,146	2,599,203	45.9	779,761	35,645	44,437	0.55	0.68
2000	12,648,424	21,790,000	3,089,000	3,018,300	–	40,545,724	10.1	20.7	0	0	5,495,225	2,745,798	50.0	823,739	35,805	44,635	0.52	0.65
2001	12,387,857	32,150,000	3,098,000	3,490,245	–	51,126,102	26.1	36.3	0	0	5,507,200	3,383,355	61.4	1,015,007	36,498	45,498	0.43	0.54
2002	14,431,246	37,574,300	2,927,000	2,329,480	–	57,262,026	12.0	21.9	0	0	6,921,687	3,898,716	56.3	1,169,615	37,058	46,196	0.38	0.47
2003	15,928,604	22,856,128	2,744,000	2,316,800	–	43,845,532	-23.4	-13.2	0	0	6,552,194	3,474,483	53.0	1,042,345	36,597	45,622	0.42	0.53
2004	8,348,714	15,389,407	2,063,000	2,413,400	–	28,214,521	-35.7	-23.8	0	0	4,421,892	2,992,071	67.7	897,621	36,072	44,969	0.48	0.60
2005	6,940,893	12,925,683	2,397,000	3,051,345	–	25,314,921	-10.3	5.6	0	0	3,909,550	3,112,344	79.6	933,703	36,203	45,131	0.47	0.58
2006	5,722,631	14,207,860	2,069,000	2,636,800	–	24,636,291	-2.7	15.8	0	0	3,808,680	3,289,376	86.4	986,813	36,396	45,371	0.44	0.55
2007	5,980,671	13,156,658	2,213,000	2,256,600	–	23,606,929	-4.2	15.8	0	0	3,641,271	2,986,470	82.0	895,941	36,066	44,961	0.48	0.60
2008	6,401,797	13,086,638	1,903,000	2,617,175	–	24,008,610	1.7	20.7	0	0	3,659,129	2,193,207	59.9	657,962	35,204	43,887	0.64	0.80
2009	8,048,466	14,620,242	2,246,000	2,020,125	–	26,934,833	12.2	25.9	0	0	4,145,781	1,950,114	47.0	585,034	34,940	43,557	0.72	0.89
2010	7,203,286	15,125,067	2,154,000	2,557,970	–	27,040,323	0.4	11.3	0	0	4,023,021	1,469,760	36.5	440,928	34,418	42,907	0.94	1.17
2011	8,522,112	12,172,807	2,205,000	2,258,107	–	25,158,026	-7.0	1.2	0	0	3,730,710	1,623,576	43.5	487,073	34,585	43,115	0.85	1.06
2012	9,815,115	20,345,243	2,327,600	1,815,719	–	34,303,677	36.4	46.0	0	0	5,249,680	1,560,586	29.7	468,176	34,516	43,030	0.88	1.10
2013	11,390,593	24,088,150	2,726,938	1,204,799	–	39,410,480	14.9	21.7	0	0	6,039,401	1,716,139	28.4	514,842	34,685	43,241	0.81	1.01
2014	15,330,399	32,803,900	3,222,717	1,841,501	–	53,198,517	35.0	41.5	0	0	8,194,624	1,645,930	20.1	493,779	34,609	43,146	0.84	1.05
2015	17,169,059	27,159,850	3,327,826	1,656,292	–	49,313,027	-7.3	-2.7	0	0	7,560,091	1,632,098	21.6	489,629	34,594	43,127	0.85	1.06
2016	16,297,628	26,162,000	4,141,007	2,392,800	–	48,993,435	-0.6	4.3	0	0	7,490,100	1,442,874	19.3	432,862	34,388	42,871	0.95	1.19
2017	17,458,418	22,566,750	4,711,159	2,489,700	–	47,226,027	-3.6	0.8	0	0	7,174,072	1,488,269	20.7	446,481	34,438	42,932	0.93	1.15
2018	14,403,862	22,935,950	5,034,677	3,734,775	–	46,109,264	-2.4	2.4	0	0	6,918,174	1,565,140	22.6	469,542	34,521	43,036	0.88	1.10

Year	NSW	QLD	SA	WA	VIC	Mainland population	Change %	Implied growth %	Reconfigured – actual	Reconfigured – quotas	Quota	Actual take	Take %	Joeys (0.30)	S1 t CO_2-e	S1+3 t CO_2-e	EEI S1	EEI S1+3
2019	12,832,394	21,071,900	4,407,116	4,249,560	–	42,560,970	-7.7	-2.6	0	0	6,222,301	1,570,473	25.2	471,142	34,527	43,043	0.88	1.10
2020	14,158,405	22,287,000	3,545,902	3,090,605	1,378,605	44,460,517	4.5	10.0	0	0	6,030,756	1,229,249	20.4	368,775	34,156	42,581	1.11	1.39
2021	10,459,983	16,663,850	2,810,547	2,412,050	1,911,550	34,257,980	-22.9	-18.8	0	0	4,506,671	1,343,183	29.8	402,955	34,280	42,736	1.02	1.27
2022	10,913,343	12,959,400	2,775,048	2,399,190	1,858,150	30,905,131	-9.8	-3.9	0	0	4,435,117	1,266,408	28.6	379,922	34,196	42,632	1.08	1.35
2023	11,882,215	16,267,200	3,833,889	2,156,550	2,363,850	36,503,704	18.1	24.3	0	0	5,132,148	1,361,679	26.5	408,504	34,300	42,761	1.01	1.26
2024	9,634,900	17,727,700	3,912,711	1,695,390	2,363,850	35,334,551	-3.2	2.4	0	0	4,979,257	1,317,231	26.5	395,169	34,252	42,700	1.04	1.30
2025	13,910,688	19,948,800	5,192,277	1,304,090	2,078,000	42,433,855	20.1	25.7	0	0	6,311,992	1,522,185	24.1	456,656	34,475	42,978	0.91	1.13
2026	9,586,809	19,308,148	4,129,219	1,364,695	2,306,000	36,694,871	-13.5	-8.1	0	0	5,191,655	1,369,000	26.4	410,700	34,308	42,771	1.00	1.25
Total						**n/a**					**217,451,571**	**103,851,716**	**47.8**	**see below**	**1,655,426**	**2,063,719**	**0.64**	**0.79**
Joeys														**31,155,515**				

Joeys total (separate from take): 31,155,515. Other non-take deaths (0.20 × take): 20,770,343. Since 2013: quota 86,186,359, take 20,469,858 (23.8%).

Appendix C. Reconfigured population tables by state, 2020–2026

Table 5.12. Reconfigured population, NSW, 2020–2026

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2020	14,158,405	–	2,126,176	469,186	–	14,158,405	14,158,405	14,158,405	–
2021	10,459,983	-26.1	1,598,761	497,285	14,870,467	10,459,983	10,459,983	14,870,467	-21.2
2022	10,913,343	4.3	1,692,207	402,719	10,760,054	10,760,054	9,107,840	15,611,586	11.5
2023	11,882,215	8.9	1,850,228	509,671	11,231,981	11,231,981	7,480,313	16,568,666	14.4
2024	9,634,900	-18.9	1,484,072	532,415	11,590,672	9,634,900	5,453,003	17,461,026	-12.5
2025	13,910,688	44.4	2,186,952	634,087	9,799,768	9,799,768	3,772,195	18,408,506	52.7
2026	9,586,809	-31.1	1,453,025	547,000 †	9,828,614	9,586,809	868,986	19,298,226	-24.2

Table 5.13. Reconfigured population, QLD, 2020–2026

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2020	22,287,000	–	2,825,150	514,144	–	22,287,000	22,287,000	22,287,000	–
2021	16,663,850	-25.2	1,981,150	601,164	23,744,484	16,663,850	16,663,850	23,744,484	-21.8
2022	12,959,400	-22.2	1,783,850	612,233	17,428,489	12,959,400	12,959,400	25,217,186	-16.8
2023	16,267,200	25.5	2,210,400	597,750	13,336,991	13,336,991	11,579,565	26,820,556	32.6
2024	17,727,700	9.0	2,486,400	516,847	13,774,065	13,774,065	9,421,922	28,605,986	14.5

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2025	19,948,800	12.5	2,941,550	609,842	14,376,201	14,376,201	6,634,514	30,691,314	16.9
2026	19,308,148	-3.2	2,850,900	568,000 †	14,899,058	14,899,058	2,885,640	32,845,683	1.4

Table 5.14. Reconfigured population, SA, 2020–2026

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2020	3,545,902	–	532,400	98,962	–	3,545,902	3,545,902	3,545,902	–
2021	2,810,547	-20.7	449,200	97,389	3,752,049	2,810,547	2,810,547	3,752,049	-16.6
2022	2,775,048	-1.3	455,800	100,896	2,945,518	2,775,048	2,417,802	3,981,171	3.9
2023	3,833,889	38.2	576,300	100,088	2,901,209	2,901,209	1,975,882	4,227,944	43.6
2024	3,912,711	2.1	589,200	106,503	3,041,198	3,041,198	1,309,020	4,500,606	6.0
2025	5,192,277	32.7	883,500	127,903	3,185,563	3,185,563	556,122	4,790,912	36.8
2026	4,129,219	-20.5	600,400	103,000 †	3,312,265	3,312,265	0	5,078,149	-16.8

Table 5.15. Reconfigured population, WA, 2020–2026

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2020	3,090,605	–	489,130	100,893	–	3,090,605	3,090,605	3,090,605	–
2021	2,412,050	-22.0	381,880	85,613	3,248,326	2,412,050	2,412,050	3,248,326	-17.1
2022	2,399,190	-0.5	375,410	82,214	2,524,836	2,399,190	2,080,435	3,444,739	4.8
2023	2,156,550	-10.1	328,470	81,938	2,515,788	2,156,550	1,725,364	3,665,892	-5.0
2024	1,695,390	-21.4	263,935	80,306	2,249,298	1,695,390	1,405,195	3,909,574	-15.7
2025	1,304,090	-23.1	182,390	74,000 †	1,744,470	1,304,090	1,149,812	4,180,073	-16.0
2026	1,364,695	4.6	191,880	78,000 †	1,323,499	1,323,499	991,208	4,487,080	13.2

Table 5.16. Reconfigured population, VIC, 2020–2026

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2020	1,378,605	–	57,900	46,064	–	1,378,605	1,378,605	1,378,605	–
2021	1,911,550	38.7	95,680	61,732	1,447,370	1,447,370	1,429,616	1,447,370	43.7
2022	1,858,150	-2.8	127,850	68,346	1,499,508	1,499,508	1,429,057	1,499,508	2.1
2023	2,363,850	27.2	166,750	72,232	1,546,940	1,546,940	1,380,188	1,546,940	32.7
2024	2,363,850	0.0	155,650	81,160	1,593,286	1,593,286	1,268,082	1,593,286	4.6
2025	2,078,000	-12.1	117,600	76,353	1,630,875	1,630,875	1,161,415	1,630,875	-6.9

Year	Published	Change %	Quota	Actual take	Max plausible (actual)	Reconfigured – actual take	Reconfigured – quotas fulfilled	Theoretical ceiling	Implied growth %
2026	2,306,000	11.0	95,450	73,000 †	1,679,433	1,679,433	1,101,156	1,679,433	16.5

Table 5.17. Reconfigured population, mainland (sum of states and aggregate test), 2020–2026

Year	Published	Reconfigured – actual (sum of states)	Reconfigured – quotas (sum of states)	Reconfigured – actual (aggregate)	Reconfigured – quotas (aggregate)	Theoretical ceiling (aggregate)
2020	44,460,517	44,460,517	44,460,517	44,460,517	44,460,517	44,460,517
2021	34,257,980	33,793,800	33,776,046	34,257,980	34,257,980	47,062,695
2022	30,905,131	30,393,200	27,994,534	30,905,131	30,905,131	49,754,190
2023	36,503,704	31,173,670	24,141,311	32,096,032	27,342,969	52,829,997
2024	35,334,551	29,738,839	18,857,221	33,263,117	22,379,043	56,070,478
2025	42,433,855	30,296,496	13,274,057	34,613,582	17,148,062	59,701,680
2026	36,694,871	30,801,063	5,846,991	35,791,663	9,394,881	63,388,570