
2008 KANGAROO QUOTA REPORT

NEW SOUTH WALES

Prepared by: Nicole Payne
Manager, Kangaroo Management Program
Department of Environment and Conservation (NSW)
North West Branch
November 2007



Contents

2008 NEW SOUTH WALES KANGAROO QUOTA REPORT	1
A: SUMMARY	2
1. Quotas 2007 and 2008	2
2. Population estimates 2007 and quotas 2008	2
3. Actual Take To 30 September 2007	3
B: POPULATION ESTIMATES AND METHOD OF SURVEY USED	4
1. Western Plains	4
2. Northern Tablelands	5
3. South-east NSW	6
C: DETERMINATION OF THE QUOTAS.....	7
1. Commercial quotas	7
2. Special quota	8
D: TRENDS IN POPULATIONS, QUOTAS AND COMMERCIAL TAKE	9
1. Populations	9
RED KANGAROO	9
EASTERN GREY KANGAROO	9
WESTERN GREY KANGAROO	11
WALLAROO.....	12
2. Quotas	12
RED KANGAROO	13
EASTERN GREY KANGAROO	13
WESTERN GREY KANGAROO	13
WALLAROO.....	13
3. Commercial take	13
RED KANGAROO	14
EASTERN GREY KANGAROO	14
WESTERN GREY KANGAROO	14
WALLAROO.....	14
E: PROPOSED CHANGES TO QUOTAS.....	15
F: NEW COMMERCIAL ZONES.....	15
REFERENCES.....	15
Appendix 1- Tables, Maps and Figures	17

Figures

Figures	i
Tables.....	ii
Figure 1. Population trends in red kangaroos New South Wales.....	35
Figure 2. Population trends in grey kangaroos New South Wales.....	36
Figure 3. NSW combined red and grey kangaroo population estimates, authorised quota & actual take 1973-2006.....	37
Figure 4. NSW red kangaroo quotas and take 1982-2008	38
Figure 5. NSW eastern grey kangaroo quotas and take 1987-2008.....	39
Figure 6. NSW western grey kangaroo quotas and take 1987-2008	39
Figure 7. NSW wallaroo quotas and take 1987-2008	41

Tables

Table A. Red and grey kangaroo population estimates for the Western Plains.	5
Table B. 2007 population estimates for the Northern Tablelands	6
Table C. 2006 population estimates for eastern grey kangaroos in each of the five Rural Lands Protection Board areas.	7
Table D. 2007 red kangaroo population estimates and trends in abundance	9
Table E. 2007 eastern grey kangaroo population estimates and trends in abundance for the Western Plains.	10
Table F. 2007 eastern grey kangaroo population estimates and trends in abundance for the Northern Tablelands zones.	10
Table G. 2007 eastern grey kangaroo population estimates and trends in abundance for South-east NSW.....	11
Table H. 2007 western grey kangaroo population estimates and trends in abundance.....	12
Table I. 2007 wallaroo population estimates and trends in abundance for the Northern Tablelands.....	12

2008 NEW SOUTH WALES KANGAROO QUOTA REPORT

New South Wales Department of Environment and Climate Change (DECC) (and its predecessor agencies) has been researching, monitoring and managing the “NSW Kangaroo Management Program” (KMP) since the 1970’s. Throughout this time adjustments have been made to the survey design, population estimation and determination of the commercial quota. This report details the Kangaroo Management Program quotas for the 2008 kangaroo take in accordance with NSW Commercial Kangaroo Harvest Management Plan 2007-2011 (the Plan) and includes:

- Current population estimates for 2007 and quotas for 2008;
- Details of trends in population estimates, quotas and commercial take data for red kangaroos, eastern and western grey kangaroos and wallaroos.

A: SUMMARY

1. Quotas 2007 and 2008

	2008		2007	
	Quota	Maximum Special Quota	Quota	Special Quota
Red kangaroo	429,156	37,867	371,074	109,139
Eastern grey kangaroo	455,403	45,540	440,438	146,813
Western grey kangaroo	108,954	10,895	98,028	32,676
Wallaroo	17,245	1,724	31,216	10,405
Totals	1,010,758	96,026	940,756	299,033

NOTE: The Special Quota must not exceed 1.5% of the species population across the whole commercial harvest zone. However, within individual management zones, Special Quota may be issued up to a limit of 5% of the population for each species. In Table 1, Special Quota for 2007 was approved for up to 5% of the population in each zone without the state-wide restriction, in accordance with the NSW Kangaroo Management Program 2002-2007.

2. Population estimates 2007 and quotas 2008

	Population Estimate 2007	Quota – 2008	Quota – Percent of Population
Red kangaroo	2,524,448	429,156	17.0
Eastern grey kangaroo - (Western Plains)	2,150,523	322,578	15.0
Eastern grey kangaroo - (Tablelands)	470,226	70,534	15.0
Eastern grey kangaroo - (South-eastern NSW)	415,271	62,291	15.0
Western grey kangaroo	726,363	108,954	15.0
Wallaroo - (Tablelands)	114,996	17,245	15.0
TOTAL	6,401,827	1,010,758	

3. Actual Take To 30 September 2007

%q – commercial take as percentage of approved quota

%p – commercial take as percentage of population estimate

Zone Name	No.	E/Grey				Red				W/Grey				Wallaroo			
		Quota	Take	%q	%p	Quota	Take	%q	%p	Quota	Take	%q	%p	Quota	Take	%q	%p
Tibooburra	1	6,396	1,932	30%	5%	61,470	28,469	46%	8%	2,459	1,820	74%	11%				
Broken Hill	2	11,734	8,487	72%	11%	123,256	76,117	62%	10%	20,737	17,311	83%	13%				
Lower Darling	4	12,048	4,559	38%	6%	19,230	15,281	79%	14%	21,052	15,439	73%	11%				
Cobar	6	11,092	7,885	71%	11%	18,330	13,138	72%	12%	20,118	13,219	66%	10%				
Bourke	7	10,759	10,599	99%	15%	43,973	36,949	84%	14%	5,758	5,008	87%	13%				
Narrabri	8	59,788	51,139	86%	13%	39,743	24,423	61%	10%								
Armidale	9	24,259	20,279	84%	13%									13,468	8,232	61%	9%
Coonabarabran	10	121,838	79,291	65%	10%	27,390	16,236	59%	10%	14,001	5,967	43%	6%				
Griffith	11	87,665	63,689	73%	11%	37,682	20,870	55%	9%	13,904	8,191	59%	9%				
Glen Innes	13	22,443	19,036	85%	13%									8,499	6,166	73%	11%
Upper Hunter	14	10,125	8,436	83%	12%									9,249	5,128	55%	8%
SE NSW	16	62,291	38,018	61%	9%												
Totals		440,438	313,350	71%	11%	371,074	231,483	62%	11%	98,029	66,955	68%	10%	31,216	19,526	63%	9%

B: POPULATION ESTIMATES AND METHOD OF SURVEY USED

Full details of the aerial survey methodology used by the Kangaroo Management Program are contained in a separate document entitled "Population Monitoring for the NSW Kangaroo Management Program", and in individual survey reports for Northern Tablelands and South-east NSW. A brief outline is provided here.

1. Western Plains

The 2007 survey of the Western Plains commenced on 4 June and was completed on 3 August. The Western Plains covers an area of approximately 450,000 square kilometres, and includes Kangaroo Management Zones 1-8, 10 and 12. The survey was conducted using well-established techniques. This methodology has been refined on the basis of additional research, but has remained largely the same since the early 1980s. It involves flying at a pre-determined speed and height, with trained observers counting animals within a strip equivalent to 100 meters on the ground. This method provides an observed density which is then multiplied by species- and habitat-specific correction factors to give a corrected density. The corrected density is then multiplied by the area of each habitat type in each zone to provide population estimates.

Correction Factors are described in detail in "Population Monitoring for the NSW Kangaroo Management Program". In essence, correction factors are used to account for the fact that not every kangaroo present will be seen by the observers. The proportion of kangaroos observed will depend on the species (because of different behaviours between species) and the nature of the habitat (a higher proportion of animals will be observed on open grasslands than in woodland habitats). These correction factors have been derived after several years of research using both helicopter and fixed-wing surveys.

Throughout this document two sets of correction factors have been used in calculating population estimates. Where data is presented for the years prior to 2001, correction factors for 200 meter wide survey strips from Cairns and Gilroy (2001) have been applied. For 2001, 2002 and 2003 data (and future years), the most recent correction factors (September 2003) for 100 meter survey strips have been applied. In the tables and figures throughout this document, dark shading has been used to show where the most recent 100 meter correction factors have been used, and light shading where 200 meter correction factors have been applied.

Table A shows the current estimated density and population of kangaroos in each of the Western Plains management zones.

Table A. Red and grey kangaroo population estimates for the Western Plains.

Management Zone	Red Kangaroo Population Estimate	Grey Kangaroo Population Estimate
Tibooburra	432,096 ± 83,347	64,222 ± 14,624
Broken Hill	1,092,982 ± 140,231	281,904 ± 64,330
Lower Darling	188,018 ± 35,052	226,569 ± 30,834
Cobar	85,912 ± 33,747	282,841 ± 49,570
Bourke	143,042 ± 27,768	183,441 ± 74,474
Narrabri	121,426 ± 26,824	697,531 ± 117,264
Coonabarabran	168,000 ± 62,949	568,378 ± 149,129
Griffith	292,969 ± 91,058	571,999 ± 202,155
Total	2,524,448 ± 206,698	2,876,886 ± 300,273

Note – Table A uses the final correction factors (ie September 2003)

The estimated numbers and densities of red and grey kangaroos in each management zone from 1986 onwards are given in Tables 1 to 8. The population trends for each species are shown in Figures 1 and 2 and Tables 14-16 (Appendix 1).

Combined red and grey kangaroo population estimates, authorised quotas and actual take (from 1973 onwards) are shown in graphical form in Figure 3, and tabular form in Table 13 (Appendix 1). Note that the combined grey kangaroo data includes Northern Tablelands and SE NSW.

2. Northern Tablelands

The Northern Tablelands commercial harvest area covers some 48,000 square kilometres and includes Kangaroo Management Zones 9, 13 and 14. Prior to 2001, the commercial quota was set on the basis of ground (walked) surveys conducted in 1989-90, which were adjusted annually based on seasonal changes and results from the surveys of neighbouring zones.

The Northern Tablelands was first surveyed by helicopter in 2001, with additional surveys in 2002, then again in 2004 (Cairns 2004). The most recent survey was conducted between 13 and 20 September this year, according to a design developed with the assistance of the DISTANCE software. As helicopter survey techniques are relatively new and still evolving, each survey is redesigned using information gained from previous surveys and advances in software capability. A full report outlining the design of the survey and analysis of the results will be available shortly.

The population estimates and commercial take of wallaroos are detailed in Table 17 and Figure 7 (Appendix 1). Wallaroo population estimates and quotas for each zone are shown in Tables 9 to 11.

The population estimates and commercial take of eastern grey kangaroos are detailed in Table 15 and Figures 3 & 5. Eastern grey population estimates and quotas for each zone are shown in Tables 9 to 11.

Table B shows the current estimated density and population of kangaroos in each of the Northern Tablelands management zones.

Table B. 2007 population estimates for the Northern Tablelands

Management Zone	Zone Area (km ²)*	Eastern Grey Kangaroo			Wallaroo		
		Density	Population Estimate	Quota	Density*	Population Estimate	Quota
Glen Innes	18,449	11.3	236,600 ± 44,039	35,490	1.5	32,184 ± 7,431	4,828
Armidale	15,809	8.7	141,610 ± 29,738	21,242	2.3	37,859 ± 14,839	5,679
Upper Hunter	14,004	6.3	92,016 ± 17,351	13,802	3.1	44,923 ± 14,995	6,738
TOTAL	48,262		470,266	70,534		114,966	17,245

*Zone Areas exclude National Park's estate, Forests and Reserves where harvesting is prohibited.

**Densities above have been multiplied by 1.85 as suggested in Cairns (2003)

3. South-east NSW

South-east NSW (Kangaroo Management Zone 16) was not surveyed in 2007. About 30% of the total area of the zone is not available for commercial harvest either because it is reserved for conservation or State Forest, or the terrain is too difficult. These areas are excluded from the survey, which covers approximately 29,500 square kilometres. The population estimate gained from the survey of the zone in September 2006 will remain current until the next survey in 2009.

The study area was originally surveyed in 2003 in accordance with a design developed by consultants based on latest methodologies (Pople, Cairns & Menke 2003). Due to the nature of the terrain, survey using fixed-wing aircraft was not possible and a helicopter was used as for the Northern Tablelands zones. The consultant's report on the results of the survey was presented with the 2005 Quota Submission and is available on the KMP web page (Cairns 2004a).

In accordance with the approval, a second aerial survey was conducted in September 2006 to provide updated population estimates. The 2006 survey was designed after consideration of the results of the original survey and harvest data, and advances in survey design software. As a result of the re-design, the 2006 survey included greater overall length of survey lines, and shorter individual lines, leading to more appropriate coverage of the total area and greater statistical precision. A full report of the 2006 survey is available (Cairns 2007).

Table C shows the current estimated density and population of kangaroos in each of the Rural Lands Protection Boards in the South-east NSW management zone.

Table C. 2006 population estimates for eastern grey kangaroos in each of the five Rural Lands Protection Board areas.

RPLB	Area (km ²)	Survey effort (km)	Density (km ⁻²)	Population Est.
Goulburn	5,973	230	19.13	114,430
Braidwood	4,284	170	16.18	64,461
Gundagai	6,373	310	8.74	106,046
Yass	5,615	190	12.93	72,588
Cooma	7,271	210	14.58	57,746
Total	29,516	1,110		415,271

The population estimates and commercial take of eastern grey kangaroos are detailed in Table 15 and Figures 3 & 5. Eastern grey population estimates and quotas for each zone are shown in Table 12.

C: DETERMINATION OF THE QUOTAS

1. Commercial quotas

Annual commercial quotas are set at a proportion of the estimated macropod populations. For the Western Plains, quotas are set at 17 percent of the estimated red kangaroo population, and 15 percent of the estimated population for eastern grey and western grey kangaroos. For the Northern Tablelands, quotas have been set at 15 percent for both eastern grey kangaroos and wallaroos. Eastern grey kangaroo quotas for the South-east NSW zone have also been set at 15 percent. These proportions are specified in the NSW Commercial Kangaroo Harvest Management Plan 2007-2011, and any proposal to set a commercial harvest quota above these rates requires specific approval from the Commonwealth.

Based on the population dynamics of red and grey kangaroos and wallaroos, and the male bias of the commercial take, quotas set at these levels are considered sustainable in the long-term for kangaroo populations. More than 20 years of available data indicates that kangaroo populations harvested at these rates continue to fluctuate primarily in response to seasonal conditions.

As the quota is based on harvesting a proportion of the estimated population, changes in populations are reflected in the quotas. As such, the quotas for 2008 are still considered to be sustainable in the long term.

A report into the drought management of kangaroos commissioned by NPWS (Pople 2003) suggested a range of strategies that reduce the risk of over-harvest in the short term. Some of these strategies require additional population surveys, which significantly increase the costs of administering the plan. The report suggests that reduced harvest rate to eight to 10 percent of the population during drought is equivalent in risk management terms to twice-yearly adjustment of a 15 percent quota based on additional population surveys.

An additional strategy to those suggested in this report was developed and utilised in 2003. This strategy entails reducing the remaining quota for the year, if updated

population estimates from the scheduled mid-year aerial surveys indicates a significant decline in populations. This strategy does not incur additional administrative costs, and further reduces any risk to populations. Remaining quotas for 2008 will be assessed following the annual aerial surveys in winter 2008, and reduced if necessary.

2. Special quota

A special quota for 2008 has been calculated in accordance with the provisions of the Plan and will potentially be available to minimise the number of kangaroos shot under non-commercial licences. The special quota will only be used when the commercial quota for a particular kangaroo management zone has been fully issued. This is not a pseudo commercial quota, its sole purpose is to provide for commercial utilisation of kangaroos that would be shot and left in the field under the normal non-commercial licensing system. As specified in the plan, the use of this quota will depend on one or more of the following:

- consideration of local conditions including exceptional circumstance declarations;
- kangaroo population trends (based on 2008 survey if completed); and
- climatic conditions during 2008.

The maximum number of animals that may be taken under Special Quota provisions in any commercial harvest zone is five percent of the population estimate for that species. However, across all commercial zones, the Special Quota utilised must not exceed 1.5 percent of the population estimate for that species.

Non-commercial take proceeds regardless of available commercial quota. An authorised DECC officer must assess each application for a non-commercial licence. In the commercial zone, non-commercial licenses are generally only requested when:

- it is not economically viable to take kangaroos commercially;
- the commercial kangaroo industry is unable to fulfil the landholders needs; or
- management zone commercial quotas are fully utilised.

It is not necessarily intended to fully utilise the special quota, unless criteria justify such action. The special quota for 2008 tends towards the upper range of what may be needed in any particular year, and will not exceed five percent of the population estimate for any harvested species in any zone.

D: TRENDS IN POPULATIONS, QUOTAS AND COMMERCIAL TAKE

1. Populations

Around 82 percent of New South Wales remains drought declared in November 2007, according to the NSW Department of Primary Industries. Despite the ongoing drought, total kangaroo populations across the western plains have increased by about 8.5 percent since the 2006 survey. This total comprised an increase of about three percent in grey kangaroo populations (0.4 percent for eastern grey and 11 percent for western grey kangaroos) and an increase of about 15.7 percent in red kangaroos.

Some zones have received significant rainfall during the past year, however most areas have not received follow-up rain and the recovery of kangaroo populations has therefore been inhibited. The patchy distribution of rainfall is apparent in the responses of kangaroos at the zone level. For example, changes in red kangaroo populations ranged from a decline of about 44 percent in the Narrabri zone to an increase of about 66 percent in the Lower Darling zone. Similarly, the Coonabarabran zone recorded a decline of 38 percent in eastern grey kangaroos, while neighbouring Narrabri zone recorded an increase of almost 75 percent. The magnitude and direction of changes suggests movement of kangaroos across zone borders in response to improved food resources.

RED KANGAROO

The 2007 red kangaroo population estimate and trends in abundance are shown in Table D. Refer to Figure 1 for trends in red kangaroo abundance since 1984.

Table D. 2007 red kangaroo population estimates and trends in abundance

Year	Population Estimate (millions)	Density (reds km ⁻²)	Trends in Abundance (from previous year)
2007	2.52 ± 0.21	4.44	16%
2006	2.18 ± 0.16	4.05	-3%
2005	2.24 ± 0.22	4.32	-11%
2004	2.51 ± 0.24	4.66	12%
2003	2.24 ± 0.16	4.22	-53%
2002	4.80 ± 0.39	9.35	-6%
2001	5.12 ± 0.34	9.74	*17%
2000	4.39 ± 0.40	8.49	-7%
1999	4.71 ± 0.44	8.82	-19%
1998	5.81 ± 0.61	11.36	10%
1997	5.29 ± 0.40	10.01	40%

Note: dark shading has been used to indicate the use of September 2003 100m CF; light shading indicates the use of 200m CF.
*Invalid comparison due to a change in correction factors and survey strip width.

EASTERN GREY KANGAROO

The 2007 grey kangaroo (eastern and western) estimate for the area surveyed by fixed-wing aircraft is 2.9 million (density 5.54 km⁻²). Refer to Figure 2 for trends in

grey kangaroo abundance since 1984. The relative proportions of eastern and western grey kangaroos in the area surveyed were examined in 2000. Application of these proportions to the 2007 survey gives an eastern grey kangaroo population estimate for the area surveyed by air of 2.15 million (3.99 km⁻²).

The 2007 eastern grey kangaroo population estimate and trends in abundance for the Western Plains are shown in Table E.

Table E. 2007 eastern grey kangaroo population estimates and trends in abundance for the Western Plains.

Year	Population Estimate (millions)	Density (eastern greys km ⁻²)	Trend in Abundance (from previous year)
2007	2.15 ± 0.27	3.99	7%
2006	2.14 ± 0.32	3.92	7%
2005	2.00 ± 0.33	3.65	-25%
2004	2.66 ± 0.32	5.03	-31%
2003	3.83 ± 0.58	7.42	-51%
2002	7.80 ± 1.02	15.07	24%
2001	6.29 ± 0.72	12.48	*22%
2000	5.17 ± 0.57	9.86	6%
1999	4.87 ± 0.42	9.43	-6%
1998	5.19 ± 0.54	9.91	17%
1997	4.43 ± 0.63	8.53	12%

Note: dark shading has been used to indicate the use of September 2003 100m CF; light shading indicates the use of 200m CF.
*Invalid comparison due to a change in correction factors and survey strip width.

The Northern Tablelands management zones were surveyed in September 2007. Based on this survey, the number of eastern grey kangaroos estimated to be in the Northern Tablelands region is 470,226. The estimate in 1989/90 was 581,950, and in 2004 was 378,847. The Northern Tablelands region will be surveyed again in 2010.

Table F. 2007 eastern grey kangaroo population estimates and trends in abundance for the Northern Tablelands zones.

Year	Zone	Population Estimate	Density (km ⁻²)	Trend in Abundance (from previous survey)
2007	Armidale	141,610	8.7	-12%
	Glen Innes	236,600	11.3	58%
	Upper Hunter	92,016	6.3	36%
2004	Armidale	161,726	10.2	4%
	Glen Innes	149,621	8.1	-35%
	Upper Hunter	67,499	4.8	-28%
2001/2	Armidale	173,109	10.6	N/A
	Glen Innes	221,975	10.6	N/A
	Upper Hunter	95,273	6.5	N/A

Tables 9b, 10b and 11b show population estimates and quotas for the Northern Tablelands management zones from 1989 to 2008.

Prior to approval of the trial commercial harvest zone in SE NSW, a baseline population estimate was established using helicopter survey methodology developed in the Northern Tablelands. A second survey was conducted in September 2006 in accordance with the approval of the trial zone, and indicated an increase of 42 percent in the population since the 2003 survey.

There are two main factors likely to have contributed to this observed increase:

- a) genuine population recovery after the extensive bushfires in 2003, and
- b) apparent increases due to changes in survey methodology based on the data gained during the initial survey and analysis of harvest data since 2004.

Table G. 2007 eastern grey kangaroo population estimates and trends in abundance for South-east NSW.

Year	Population Estimate	Density (km ⁻²)	Trend in Abundance (from previous survey)
2006	415,271	14.07	42%
2003	292,455	11.95	N/A

Table 12 shows population estimates and quotas for the South-east NSW management zone.

WESTERN GREY KANGAROO

The 2007 grey kangaroo (eastern and western) estimate for the area surveyed by fixed-wing aircraft is 2.9 million (density 5.54 km⁻²). Refer to Figure 2 for trends in grey kangaroo abundance since 1984. The relative proportions of eastern and western grey kangaroos in the area surveyed were examined in 2000. Application of these proportions to the 2007 survey gives a western grey kangaroo population estimate for the area surveyed by air of 726,363 (1.55 km⁻²).

The 2007 western grey kangaroo population estimate and trends in abundance for the Western Plains are shown in Table H.

Table H. 2007 western grey kangaroo population estimates and trends in abundance.

Year	Population Estimate (millions)	Density (western greys km ⁻²)	Trend in Abundance (from previous year)
2007	0.73 ± 0.87	1.55	11%
2006	0.65 ± 0.11	1.35	9%
2005	0.60 ± 0.09	1.31	-33%
2004	0.89 ± 0.11	1.89	-29%
2003	1.27 ± 0.26	2.72	-47%
2002	2.39 ± 0.30	5.02	18%
2001	2.03 ± 0.22	4.53	*13%
2000	1.79 ± 0.24	3.86	-14%
1999	2.09 ± 0.19	4.50	11%
1998	1.88 ± 0.18	3.97	-11%
1997	2.11 ± 0.27	4.33	22%

Note: dark shading has been used to indicate the use of September 2003 100m CF; light shading indicates the use of 200m CF.
*Invalid comparison due to a change in correction factors and survey strip width.

WALLAROO

The 2007 wallaroo population estimate and trends in abundance for the Northern Tablelands management zones are shown in Table H.

Tables 9a, 10a and 11a show population estimates and quotas from 1989 to 2008.

Table I. 2007 wallaroo population estimates and trends in abundance for the Northern Tablelands.

Year	Zone	Population Estimate	Density (km ⁻²)	Trend in Abundance (from previous survey)
2007	Armidale	37,859	2.3	-58%
	Glen Innes	32,184	1.5	-43%
	Upper Hunter	44,923	3.1	-27%
2004	Armidale	89,787	5.7	158%
	Glen Innes	56,657	3.1	-56%
	Upper Hunter	61,660	4.4	7%
2001/2	Armidale	34,744	2.1	N/A
	Glen Innes	128,323	6.1	N/A
	Upper Hunter	57,762	4.0	N/A

2. Quotas

Quotas have been set at the same percentage of the population estimate for several years. These proportions are specified in the Plan, and are considered to be sustainable in the long term, based on the population dynamics of the species and the selectivity of kangaroo trappers for male kangaroos.

RED KANGAROO

The quota for 2008 of 429,156 represents 17 percent of the population estimated by aerial survey, as specified in the NSW Commercial Kangaroo Harvest Management Plan 2007-11.

EASTERN GREY KANGAROO

The quota for 2008 of 322,578 for the Western Plains represents 15 percent of the population estimated by aerial survey as specified in the NSW Commercial Kangaroo Harvest Management Program 2007-11.

The quota for 2008 of 70,534 for the Northern Tablelands region represents 15 percent of the estimated population of 470,226 derived from aerial surveys in 2007.

The South-east NSW quota is 62,291 which represents 15 percent of the population estimate of 415,271 derived from aerial surveys in 2006.

The combined 2008 eastern grey quota is 455,403.

WESTERN GREY KANGAROO

The quota for 2008 of 108,954 represents 15 percent of the population estimated by aerial survey as specified in the NSW Commercial Kangaroo Harvest Management Plan 2007-11.

WALLAROO

For 2004, the quotas for wallaroos in the Tablelands were changed from five percent to 15 percent of the population estimate as a result of the more rigorous scientific basis to survey and estimation methodologies. For the 2008 quota, this proportion will remain at 15 percent, which is in accordance with the NSW Commercial Kangaroo Harvest Management Plan 2007-11.

The 2008 quota is 17,245 for the Tablelands.

3. Commercial take

Species: Red Kangaroo (*Macropus rufus*)
Eastern Grey Kangaroo (*Macropus giganteus*)
Western Grey Kangaroo (*Macropus fuliginosus*)
Wallaroo (*Macropus robustus robustus*)

Extent: Commercial Zone

Frequency: Continuous

Methodology: Collection and compilation of returns from licensed Trappers, Registered Premises and Wholesalers

Data: Species, sex, group weight and location taken (property)

RED KANGAROO

Trapper returns indicate that during 2006, 67.3 percent of red kangaroos taken were males). For the year to 30 September 2007, trapper returns reported a male bias of 67.2 percent, which is consistent with the long-term average of 69.4 percent.

The actual take of red kangaroos is shown against the authorised quota in Table 14 and Figure 4.

The *average* take as a proportion of the authorised quota from 1997 to 2006 is 68.8 percent.

EASTERN GREY KANGAROO

Trapper returns indicate that during 2006, 66.9 percent of eastern grey kangaroos taken were males). For the year to 30 September 2007, trapper returns report a male bias of 67.5 percent, which is consistent with the long-term average of 70.2 percent.

The actual take of eastern grey kangaroos is shown against the authorised quota in Table 15 and Figure 5.

The *average* take as a proportion of the authorised quota from 1997 to 2006 is 79.1 percent.

WESTERN GREY KANGAROO

Trapper returns indicate that during 2006, 70.2 percent of western grey kangaroos taken were males). For the year to 30 September 2007, trapper returns record a male bias of 67.3 percent, which is consistent with the long-term average of 66.6 percent.

The actual take of western grey kangaroos is shown against the authorised quota in Table 16 and Figure 6.

The *average* take as a proportion of the authorised quota from 1997 to 2006 is 64.8 percent.

WALLAROO

Trapper returns indicate that during 2006, 86.0 percent of western grey kangaroos taken were males. For the year to 30 September 2007, trapper returns record a male bias of 87.4 percent, which is consistent with the long-term average of 87.8 percent.

The actual take of wallaroos is shown against the authorised quota in Table 17 and Figure 7.

The *average* take as a proportion of the authorised quota from 1997 to 2006 is 44.1 percent.

E: PROPOSED CHANGES TO QUOTAS

DECC does not propose to make any changes to the proportional commercial harvest quotas during 2008.

F: NEW COMMERCIAL ZONES

A proposal has been received but not yet fully assessed to introduce a new commercial harvest zone covering the Rural Lands Boards of Mudgee-Merriwa, Hunter, Central Tablelands, Young, and parts of Dubbo, Forbes and Molong. The latter three are already partially within the existing commercial harvest zones.

The request has been made by the relevant Rural Lands Protection Boards in conjunction with the NSW Farmers' Association. It is based on relatively high levels of non-commercial culling over several years in most of these board areas.

The proposal has been referred to the NSW Kangaroo Management Advisory Panel for comment and will be discussed fully at its next meeting in March 2008.

Should the proposal proceed, a baseline aerial survey would be conducted to establish population estimates prior to setting commercial quotas.

REFERENCES

Cairns, S.C. (2004). A report to the New South Wales National Parks & Wildlife Service on the consultancy: 'Kangaroo monitoring - New England Tablelands Helicopter Survey'. School of Environmental Services and Natural Resource Management, Armidale.

Cairns, S.C. (2004a). A report to the New South Wales National Parks & Wildlife Service on the consultancy: 'Kangaroo monitoring - South East New South Wales Helicopter Survey'. School of Environmental Services and Natural Resource Management, Armidale.

Cairns, S.C. (2007). A report to the New South Wales Department of Environment and Climate Change on the consultancy: 'Kangaroo monitoring- South East New South Wales Trial Commercial Harvest Zone Redesign and Analysis of Helicopter Survey'. School of Environmental Services and Natural Resource Management, Armidale.

Cairns, S.C., and Gilroy, J. (2001). Re-appraisal and enhancement of current Methodology Used in the Estimation of Kangaroo Populations in Western New South Wales. University of New England and NSW National Parks & Wildlife Service.

Caughley, G., Brown, B., Dostine, P. and Grice, D. (1984) The Grey Kangaroo overlap zone. *Australian Wildlife Research* **11**: 1-10.

Pople A.R. (2003) Harvest Management of Kangaroos during a drought. *Unpublished report to NSW NPWS*

Pople, A.R., Cairns, S.C. and Menke, N. (2003) Monitoring Kangaroo Populations in Southeastern New South Wales. *Consultancy report to NSW NPWS*

Appendix 1- Tables and Figures

Kangaroo Management Zone No. 1- TIBOOBURRA

Table 1a. RED KANGAROO

AVERAGE DENSITY		16.92			
AREA : Km., sq.		54,848			
STANDARD DEVIATION		6.91			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	606,900	11.1	16.2		
1987	693,100	12.6	14.2		
1988	1,078,700	19.7	55.6	73,000	10.5
1989	1,123,200	20.5	4.1	147,800	13.7
1990	1,004,500	18.3	-10.6	161,900	14.4
1991	1,468,600	26.8	46.2	149,200	14.9
1992	845,000	15.4	-42.5	337,800	23.0
1993	1,230,319	22.4	45.6	135,200	16.0
1994	1,103,648	20.1	-10.3	221,457	18.0
1995	1,078,399	19.7	-2.3	139,300	12.6
1996	1,009,295	18.4	-6.4	141,100	13.1
1997	1,673,668	30.5	65.8	132,800	13.2
1998	1,576,827	28.7	-5.8	190,900	11.4
1999	925,897	16.9	-41.3	104,570	6.6
2000	927,889	16.9	0.2	107,300	11.6
2001	1,389,398	25.3	49.7	106,200	11.4
2002	754,013	13.7	-45.7	229,200	16.5
2003	420,721	7.7	-44.2	124,700	16.5
2004	487,004	8.9	15.8	71,523	17.0
2005	629,502	11.5	29.3	82,791	17.0
2006	361,586	6.6	-42.6	107,015	17.0
2007	432,096	7.9	19.5	61,470	17.0
2008				73,456	17.0

Table 1b. GREY KANGAROO

AVERAGE DENSITY		2.22			
AREA : Km., sq.		54,848			
STANDARD DEVIATION		1.63			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	40,900	0.7	52.0		
1987	48,100	0.9	17.6		
1988	46,700	0.9	-2.9	5,000	10.4
1989	56,100	1	20.1	4,500	9.6
1990	83,400	1.5	48.7	7,400	13.2
1991	55,500	1	-33.5	11,000	13.2
1992	45,900	0.8	-17.3	8,900	16.0
1993	136,489	2.5	197.4	7,803	17.0
1994	162,375	3	19.0	34,122	25.0
1995	150,510	2.7	-7.3	8,653	5.3
1996	151,515	2.8	0.7	10,460	6.9
1997	274,399	5	81.1	7,185	4.7
1998	356,751	6.5	30.0	12,410	4.5
1999	212,896	3.9	-40.3	36,300	10.2
2000	209,231	3.8	-1.7	16,350	7.7
2001	242,312	4.4	15.8	18,100	8.7
2002	184,093	3.4	-24.0	41,700	17.2
2003	73,098	1.3	-60.3	31,000	16.8
2004	72,890	1.3	-0.3	10,965	15.0
2005	52,605	1	-27.8	10,933	15.0
2006	59,034	1.1	12.2	7,891	15.0
2007	64,222	1.2	8.8	8,855	15.0
2008				9,633	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 2- BROKEN HILL

Table 2a. RED KANGAROO

AVERAGE DENSITY		12.57			
AREA : Km., sq.		90,845			
STANDARD DEVIATION		3.69			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	925,100	10.2	41.0		
1987	1,060,000	11.7	14.6		
1988	1,202,400	13.2	13.4	121,000	11.4
1989	1,381,500	15.2	14.9	169,000	14.1
1990	1,654,100	18.2	19.7	203,700	14.7
1991	1,480,900	16.3	-10.5	252,600	15.3
1992	1,031,700	11.4	-30.3	263,900	17.8
1993	1,205,576	13.3	16.9	160,785	15.6
1994	1,059,378	11.7	-12.1	148,568	12.3
1995	1,477,215	16.3	39.4	125,732	11.9
1996	1,100,017	12.1	-25.5	174,059	11.8
1997	1,785,627	19.7	62.3	120,768	11.0
1998	1,437,241	15.8	-19.5	223,480	12.5
1999	1,358,991	15	-5.4	203,800	14.2
2000	959,482	10.6	-29.4	191,175	14.1
2001	1,487,845	16.4	55.1	143,000	14.9
2002	1,121,294	12.3	-24.6	220,200	14.8
2003	584,448	6.4	-47.9	166,950	14.9
2004	925,845	10.2	58.4	99,356	17.0
2005	538,956	5.9	-41.8	157,394	17.0
2006	725,035	8	34.5	91,622	17.0
2007	1,092,982	12.0	50.7	123,256	17.0
2008				185,807	17.0

Table 2b. GREY KANGAROO

AVERAGE DENSITY		5.74			
AREA : Km., sq.		90,845			
STANDARD DEVIATION		3.57			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	204,700	2.3	142.2		
1987	271,900	3	32.8		
1988	263,100	2.9	-3.2	34,800	12.8
1989	247,800	2.7	-5.8	38,600	14.7
1990	465,100	5.1	87.7	37,100	15.0
1991	449,700	5	-3.3	81,600	17.5
1992	457,500	5	1.7	102,900	22.9
1993	1,071,541	11.8	134.2	106,642	23.3
1994	660,124	7.3	-38.4	81,954	7.6
1995	1,291,048	14.2	95.6	50,450	7.6
1996	704,719	7.8	-45.4	118,800	9.2
1997	840,578	9.3	19.3	59,687	8.5
1998	711,846	7.8	-15.3	62,650	7.5
1999	645,471	7.1	-9.3	79,160	11.1
2000	730,421	8	13.2	71,650	11.1
2001	723,937	8	-0.9	71,600	9.8
2002	982,041	10.8	35.7	101,000	14.0
2003	263,796	2.9	-73.1	138,000	14.1
2004	251,867	2.8	-4.5	39,569	15.0
2005	174,358	1.9	-30.8	37,780	15.0
2006	216,474	2.4	24.2	26,154	15.0
2007	281,904	3.1	30.2	32,471	15.0
2008				42,286	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 4- LOWER DARLING

Table 3a. RED KANGAROO

AVERAGE DENSITY		5.22			
AREA : Km., sq.		56,460			
STANDARD DEVIATION		2.16			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	194,300	3.4	21.4		
1987	201,200	3.6	3.6		
1988	307,900	5.5	53.0	19,000	9.4
1989	260,300	4.6	-15.5	26,700	8.7
1990	349,400	6.2	34.2	34,800	13.4
1991	377,600	6.7	8.1	49,700	14.2
1992	399,200	7.1	5.7	86,800	23.0
1993	268,066	4.7	-32.8	95,808	24.0
1994	555,979	9.8	107.4	42,890	16.0
1995	402,592	7.1	-27.6	75,768	13.6
1996	385,844	6.8	-4.2	55,900	13.9
1997	493,302	8.7	27.9	73,117	18.9
1998	315,945	5.6	-36.0	75,000	15.2
1999	364,651	6.5	15.4	39,910	12.6
2000	221,468	3.9	-39.3	54,300	14.9
2001	279,185	4.9	26.1	36,820	16.6
2002	468,072	8.3	67.7	40,900	14.6
2003	197,864	3.5	-57.7	69,200	14.8
2004	166,340	2.9	-15.9	33,637	17.0
2005	124,665	2.2	-25.1	28,278	17.0
2006	113,119	2	-9.3	21,193	17.0
2007	188,018	3.3	66.2	19,230	17.0
2008				31,963	17.0

Table 3b. GREY KANGAROO

AVERAGE DENSITY		8.36			
AREA : Km., sq.		56,460			
STANDARD DEVIATION		4.85			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	335,300	5.9	245.0		
1987	325,200	5.8	-3.0		
1988	184,200	3.3	-43.4	46,600	14.3
1989	248,200	4.4	34.7	19,100	10.4
1990	445,800	7.9	79.6	39,700	16.0
1991	696,900	12.3	56.3	75,800	17.0
1992	573,900	10.2	-17.6	188,163	27.0
1993	1,091,834	19.3	90.2	134,293	23.4
1994	1,050,128	18.6	-3.8	207,448	19.0
1995	880,562	15.6	-16.1	88,660	8.4
1996	609,376	10.8	-30.8	91,124	10.3
1997	620,029	11	1.7	59,340	9.7
1998	497,977	8.8	-19.7	54,150	8.7
1999	663,487	11.8	33.2	59,100	11.9
2000	362,692	6.4	-45.3	70,750	10.7
2001	454,782	8.1	25.4	44,600	12.3
2002	512,465	9.1	12.7	69,300	15.2
2003	336,387	6	-34.4	78,300	15.3
2004	306,466	5.4	-8.9	50,458	15.0
2005	110,876	2	-63.8	45,970	15.0
2006	220,666	3.9	99.0	16,631	15.0
2007	226,569	4.0	2.7	33,100	15.0
2008				33,985	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 6- COBAR

Table 4a. RED KANGAROO

AVERAGE DENSITY		4.38			
AREA : Km., sq.		40,339			
STANDARD DEVIATION		1.48			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	129,100	3.2	49.4		
1987	183,300	4.5	42.0		
1988	164,300	4.1	-10.4	30,500	16.6
1989	209,200	5.2	27.3	27,000	16.4
1990	264,300	6.6	26.3	38,300	18.3
1991	238,600	5.9	-9.7	48,500	18.4
1992	170,700	4.2	-28.5	45,300	19.0
1993	127,658	3.2	-25.2	27,312	16.0
1994	201,113	5	57.5	12,766	10.0
1995	151,314	3.8	-24.8	28,116	14.0
1996	170,917	4.2	13.0	31,441	20.8
1997	163,624	4.1	-4.3	19,780	11.6
1998	312,413	7.7	90.9	25,580	15.6
1999	228,367	5.7	-26.9	41,640	13.3
2000	231,400	5.7	1.3	29,375	12.9
2001	196,029	4.9	-15.3	29,700	12.8
2002	258,662	6.4	32.0	29,200	14.9
2003	121,756	3	-52.9	38,600	14.9
2004	146,292	3.6	20.2	20,699	17.0
2005	117,137	2.9	-19.9	24,870	17.0
2006	107,825	2.7	-7.9	19,913	17.0
2007	85,913	2.1	-20.3	18,330	17.0
2008				14,605	17.0

Table 4b. GREY KANGAROO

AVERAGE DENSITY		11.98			
AREA : Km., sq.		40,339			
STANDARD DEVIATION		7.21			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	183,100	4.5	134.7		
1987	146,800	3.6	-19.8		
1988	226,000	5.6	54.0	20,500	14.0
1989	250,100	6.2	10.7	31,600	14.0
1990	275,100	6.8	10.0	38,800	15.5
1991	305,800	7.6	11.2	44,700	16.2
1992	313,000	7.8	2.4	73,400	24.0
1993	602,794	14.9	92.6	78,250	25.0
1994	558,152	13.8	-7.4	126,587	21.0
1995	894,671	22.2	60.3	47,542	8.5
1996	598,600	14.8	-33.1	73,738	8.2
1997	683,136	16.9	14.1	40,820	6.8
1998	775,992	19.2	13.6	40,900	6.0
1999	857,216	21.3	10.5	81,650	10.5
2000	755,493	18.7	-11.9	78,850	9.2
2001	1,052,432	26.1	39.3	67,700	9.0
2002	938,507	23.3	-10.8	131,500	12.5
2003	551,434	13.7	-41.2	114,900	12.2
2004	303,491	7.5	-45.0	82,715	15.0
2005	279,121	6.9	-8.0	45,524	15.0
2006	208,066	5.2	-25.5	41,868	15.0
2007	282,841	7.0	35.9	31,210	15.0
2008				42,426	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 7- BOURKE

Table 5a. RED KANGAROO

AVERAGE DENSITY		5.30			
AREA : Km., sq.		55,005			
STANDARD DEVIATION		2.72			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	122,200	2.2	-36.7		
1987	244,300	4.4	99.9		
1988	239,000	4.3	-2.2	29,000	11.9
1989	391,200	7.1	63.7	35,100	14.7
1990	483,100	8.8	23.5	65,500	16.7
1991	356,600	6.5	-26.2	82,600	17.1
1992	245,300	4.5	-31.2	60,600	17.0
1993	380,260	6.9	55.0	39,248	16.0
1994	230,959	4.2	-39.3	68,447	18.0
1995	171,539	3.1	-25.7	14,920	6.5
1996	192,031	3.5	11.9	14,920	8.7
1997	208,276	3.8	8.5	19,080	9.9
1998	281,932	5.1	35.4	23,055	11.1
1999	380,435	6.9	34.9	45,950	16.3
2000	438,249	8	15.2	52,500	13.8
2001	487,321	8.9	11.2	59,200	13.5
2002	756,705	13.8	55.3	72,900	15.0
2003	191,581	3.5	-74.7	114,450	15.1
2004	203,764	3.7	6.4	32,569	17.0
2005	220,567	4	8.2	34,640	17.0
2006	258,668	2.7	17.3	37,496	17.0
2007	143,043	2.6	-44.7	43,973	17.0
2008				24,317	17.0

Table 5b. GREY KANGAROO

AVERAGE DENSITY		9.05			
AREA : Km., sq.		55,005			
STANDARD DEVIATION		5.94			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	173,100	3.1	-6.3		
1987	258,300	4.7	49.2		
1988	225,200	4.1	-12.8	29,000	11.2
1989	274,400	5	21.8	33,800	15.0
1990	454,300	8.3	65.6	42,000	15.3
1991	338,200	6.1	-25.6	75,600	16.6
1992	524,400	9.5	55.1	54,100	16.0
1993	1,147,159	20.9	118.8	144,734	27.6
1994	753,367	13.7	-34.3	240,903	21.0
1995	438,500	8	-41.8	50,473	6.7
1996	554,855	10.1	26.5	17,500	4.0
1997	645,291	11.7	16.3	34,005	6.1
1998	616,180	11.2	-4.5	47,090	7.3
1999	751,599	13.7	22.0	65,950	10.7
2000	828,888	15.1	10.3	79,250	10.5
2001	1,220,882	22.2	47.3	88,300	10.7
2002	1,013,389	18.4	-17.0	152,200	12.5
2003	298,422	5.4	-70.6	126,700	12.5
2004	268,883	4.9	-9.9	44,763	15.0
2005	181,025	3.3	-32.7	40,332	15.0
2006	110,115	2	-39.2	27,154	15.0
2007	183,442	3.3	66.6	16,517	15.0
2008				27,516	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 8-NARRABRI

Table 6a. RED KANGAROO

AVERAGE DENSITY		4.96			
AREA : Km., sq.		65,787			
STANDARD DEVIATION		3.91			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	95,400	1.5	-28.3		
1987	138,600	2.1	45.3		
1988	168,100	2.6	21.3	15,000	10.8
1989	272,300	4.1	62.0	26,900	16.0
1990	246,100	3.7	-9.6	44,500	16.3
1991	242,600	3.7	-1.4	41,700	16.9
1992	170,100	2.6	-29.9	41,200	17.0
1993	458,957	7	169.8	27,216	16.0
1994	222,974	3.4	-51.4	91,791	20.0
1995	297,913	4.5	33.6	17,220	7.7
1996	124,694	1.9	-58.1	26,809	9.0
1997	283,171	4.3	127.1	11,865	9.5
1998	1,046,075	15.9	269.4	23,200	8.2
1999	506,146	7.7	-51.6	109,450	10.5
2000	924,453	14.1	82.6	52,850	10.4
2001	532,460	8.1	-42.4	98,400	10.6
2002	692,966	10.5	30.1	79,800	15.0
2003	224,010	3.4	-67.7	103,950	15.0
2004	167,484	2.5	-25.2	38,082	17.0
2005	198,190	3	18.3	28,472	17.0
2006	233,780	3.6	18.0	33,692	17.0
2007	121,426	1.8	-48.1	39,743	17.0
2008				20,642	17.0

Table 6b. GREY KANGAROO

AVERAGE DENSITY		13.60			
AREA : Km., sq.		65,787			
STANDARD DEVIATION		7.20			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	408,600	6.2	-21.1		
1987	724,300	11	77.3		
1988	431,900	6.6	-40.4	75,000	10.4
1989	808,200	12.3	87.1	71,200	16.5
1990	1,005,900	15.3	24.5	142,700	17.7
1991	987,000	15	-1.9	186,000	18.5
1992	898,500	13.7	-9.0	187,500	19.0
1993	1,964,801	29.9	118.7	188,685	21.0
1994	1,168,552	17.8	-40.5	412,608	21.0
1995	835,633	12.7	-28.5	103,530	8.9
1996	369,992	5.6	-55.7	61,964	7.4
1997	671,027	10.2	81.4	34,931	9.4
1998	1,214,523	18.5	81.0	63,543	9.5
1999	867,516	13.2	-28.6	175,310	14.4
2000	1,491,090	22.7	71.9	119,500	13.8
2001	1,523,954	23.2	2.2	182,500	12.2
2002	1,927,959	29.3	26.5	191,200	12.5
2003	874,080	13.3	-54.7	247,300	12.8
2004	367,179	5.6	-58.0	131,112	15.0
2005	399,672	6.1	8.8	55,077	15.0
2006	398,589	6.1	-0.3	59,853	15.0
2007	697,531	10.6	75.0	59,788	15.0
2008				104,630	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 10-COONABARABRAN

Table 7a. RED KANGAROO

AVERAGE DENSITY		3.76			
AREA : Km., sq.		61,590			
STANDARD DEVIATION		1.89			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	111,700	1.8	-31.6		
1987	100,200	1.6	-10.3		
1988	135,800	2.2	35.5	11,000	11.0
1989	213,200	3.5	57.0	19,900	14.7
1990	186,000	3	-12.8	33,100	15.5
1991	311,600	5.1	67.5	29,900	16.1
1992	114,400	1.9	-63.3	71,700	23.0
1993	353,658	5.7	209.1	18,304	16.0
1994	95,586	1.6	-73.0	70,732	20.0
1995	254,715	4.1	166.5	9,675	10.1
1996	170,558	2.8	-33.0	23,494	9.2
1997	344,758	5.6	102.1	11,535	6.8
1998	567,057	9.2	64.5	24,015	7.0
1999	392,685	6.4	-30.8	64,100	11.3
2000	295,403	4.8	-24.8	44,000	11.2
2001	301,341	4.9	2.0	42,320	14.3
2002	345,431	5.6	14.6	45,100	15.0
2003	204,649	3.3	-40.8	51,300	14.9
2004	199,348	3.2	-2.6	34,790	17.0
2005	135,328	2.2	-32.1	33,889	17.0
2006	161,119	2.6	19.1	23,006	17.0
2007	168,001	2.7	4.3	27,390	17.0
2008				28,560	17.0

Table 7b. GREY KANGAROO

AVERAGE DENSITY		20.24			
AREA : Km., sq.		61,590			
STANDARD DEVIATION		11.33			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	519,700	8.4	-13.8		
1987	546,300	8.9	5.1		
1988	456,100	7.4	-16.5	77,800	14.2
1989	706,400	11.5	54.9	74,500	16.3
1990	755,700	12.3	7.0	124,600	17.6
1991	811,410	13.2	7.4	138,100	18.3
1992	521,100	8.5	-35.8	219,100	27.0
1993	2,151,730	34.9	312.9	88,587	17.0
1994	1,497,000	24.3	-30.4	537,933	25.0
1995	1,768,625	28.7	18.1	62,007	4.1
1996	1,422,035	23.1	-19.6	83,312	4.7
1997	1,683,707	27.3	18.4	54,810	3.9
1998	1,551,195	25.2	-7.9	91,245	5.4
1999	1,717,979	27.9	10.8	130,250	8.4
2000	1,430,884	23.2	-16.7	137,600	8.0
2001	2,078,208	33.7	45.2	112,700	7.9
2002	3,195,179	51.9	53.7	245,800	11.8
2003	1,824,168	29.6	-42.9	375,000	11.7
2004	1,259,605	20.5	-30.9	273,625	15.0
2005	702,576	11.4	-44.2	188,941	15.0
2006	905,594	14.7	28.9	105,386	15.0
2007	568,378	9.2	-37.2	135,839	15.0
2008				85,257	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 11- GRIFFITH

Table 8a. RED KANGAROO

AVERAGE DENSITY		3.40			
AREA : Km., sq.		98,171			
STANDARD DEVIATION		1.30			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	132,500	1.3	-69.0		
1987	128,900	1.3	-2.7		
1988	180,300	1.8	39.9	16,960	13.2
1989	249,900	2.5	38.6	29,200	16.2
1990	311,800	3.2	24.8	38,300	15.3
1991	278,900	2.8	-10.6	51,800	16.6
1992	408,500	4.2	46.5	48,800	17.5
1993	370,933	3.8	-9.2	94,895	23.2
1994	490,469	5	32.2	35,040	9.4
1995	351,806	3.6	-28.3	72,952	14.9
1996	633,758	6.5	80.1	38,930	11.1
1997	333,569	3.4	-47.4	76,868	12.1
1998	272,267	2.8	-18.4	33,310	10.0
1999	548,493	5.6	101.5	32,650	12.0
2000	393,042	4	-28.3	58,950	10.7
2001	447,833	4.6	13.9	43,110	11.0
2002	401,414	4.1	-10.4	48,600	10.9
2003	290,084	3	-27.7	35,200	8.8
2004	212,159	2.2	-26.9	49,314	17.0
2005	277,153	2.8	30.6	36,067	17.0
2006	221,656	2.3	-20.0	47,116	17.0
2007	292,970	3.0	32.2	37,682	17.0
2008				49,805	17.0

Table 8b. GREY KANGAROO

AVERAGE DENSITY		8.40			
AREA : Km., sq.		98,171			
STANDARD DEVIATION		4.13			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1986	226,100	2.3	41.5		
1987	238,600	2.4	5.5		
1988	256,300	2.6	7.4	35,904	15.0
1989	401,000	4.1	56.5	43,500	17.0
1990	566,000	5.8	41.1	62,800	15.7
1991	704,600	7.2	24.5	105,100	18.6
1992	669,100	6.8	-5.0	190,200	27.0
1993	1,395,898	14.2	108.6	160,584	24.0
1994	1,105,248	11.3	-20.8	108,744	7.8
1995	1,093,657	11.1	-1.0	128,016	11.6
1996	1,288,316	13.1	17.8	113,564	10.4
1997	1,121,800	11.4	-12.9	128,047	9.9
1998	1,349,050	13.7	20.3	74,650	6.7
1999	1,244,734	12.7	-7.7	154,860	11.5
2000	1,157,073	11.8	-7.0	131,050	10.5
2001	1,022,526	10.4	-11.6	147,600	12.8
2002	1,437,265	14.6	40.6	140,100	13.7
2003	874,589	8.9	-39.1	194,450	13.5
2004	722,872	7.4	-17.3	131,188	15.0
2005	701,493	7.1	-3.0	108,431	15.0
2006	677,124	6.9	-3.5	105,224	15.0
2007	571,999	5.8	-15.5	101,569	15.0
2008				85,800	15.0

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

KANGAROO MANAGEMENT ZONE No. 9-ARMIDALE

Table 9a. WALLAROO

AVERAGE DENSITY		6.5			
AREA : Km., sq.		16,331			
STANDARD DEVIATION		1.69			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	84,000			280	
1990	115,836	7.1	38	2,800	3.3
1991	121,520	7.4	5	2,800	2.4
1992	127,680	7.8	5	6,160	5.1
1993	127,680	7.8	0	6,160	4.8
1994	121,296	7.4	-5	6,432	5.0
1995	126,148	7.7	4	6,118	5.0
1996	98,396	6.0	-22	6,308	5.0
1997	111,187	6.8	13	4,920	5.0
1998	120,860	7.4	9	5,559	5.0
1999	119,651	7.3	-1	6,043	5.0
2000	125,600	7.7	5	5,975	5.0
2001	125,600	7.7	0	6,250	5.0
2002	125,600	7.7	0	6,250	5.0
2003 *	34,744	2.1	-72	6,250	5.0
2004 **	89,787	5.7	158	5,212	15.0
2005 **	89,787	5.7	0	13,468	15.0
2006 **	89,787	5.7	0	13,468	15.0
2007 ***	37,859	2.3	-58	13,468	15
2008				5,679	15

Table 9b. GREY KANGAROO

AVERAGE DENSITY		11.6			
AREA : Km., sq.		16,331			
STANDARD DEVIATION		1.89			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	177,500	10.9			
1990	213,000	13.0	20	17,750	10.0
1991	223,650	13.7	5	21,300	10.0
1992	223,650	13.7	0	33,370	14.9
1993	234,655	14.4	5	46,931	21.0
1994	199,474	12.2	-15	46,931	20.0
1995	207,462	12.7	4	43,882	22.0
1996	161,821	9.9	-22	45,640	22.0
1997	182,857	11.2	13	32,364	20.0
1998	198,765	12.2	9	31,085	17.0
1999	196,777	12.0	-1	33,790	17.0
2000	206,600	12.7	5	33,450	17.0
2001 *	173,109	10.6	-16	35,100	17.0
2002 *	173,109	10.6	0	25,966	15.0
2003 *	180,456	11.0	4	25,966	15.0
2004 **	161,726	10.2	-10	27,068	15.0
2005 **	161,726	10.2	0	24,259	15.0
2006 **	161,726	10.2	0	24,259	15.0
2007 ***	141,610	8.7	-12	24,259	15
2008				21,242	15

* Population estimate based on aerial surveys conducted in 2001/2002

**Population estimate based on aerial surveys conducted in 2004

*** Population estimate based on aerial surveys conducted in 2007

KANGAROO MANAGEMENT ZONE No. 13- GLEN INNES

Table 10a. WALLAROO

AVERAGE DENSITY		5.6			
AREA : Km., sq.		20,941			
STANDARD DEVIATION		2.13			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	84,000			280	
1990	115,836	5.5	38	2,800	3.3
1991	121,520	5.8	5	2,800	2.4
1992	127,680	6.1	5	6,160	5.1
1993	127,680	6.1	0	6,160	4.8
1994	121,296	5.8	-5	6,432	5
1995	126,148	6	4	6,118	5
1996	98,396	4.7	-22	6,308	5
1997	111,187	5.3	13	4,920	5
1998	120,860	5.8	9	5,559	5
1999	119,651	5.7	-1	6,043	5
2000	125,600	6	5	5,975	5
2001	215,500	10.3	72	6,250	5
2002	215,500	10.3	0	6,250	2.9
2003 *	128,232	6.1	-40	6,250	2.9
2004 **	56,657	3.1	-56	19,235	15
2005 **	56,657	3.1	0	8,499	15
2006 **	56,657	3.1	0	8,499	15
2007 ***	32,184	1.5	-43	8,499	15
2008				4,828	15

Table 10b. GREY KANGAROO

AVERAGE DENSITY		9.70			
AREA : Km., sq.		20,941			
STANDARD DEVIATION		1.14			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	177,500	8.5			
1990	213,000	10.2	20	17,750	10.0
1991	223,650	10.7	5	21,300	10.0
1992	223,650	10.7	0	33,370	14.9
1993	234,655	11.2	5	46,931	21.0
1994	199,474	9.5	-15	46,931	20.0
1995	207,462	9.9	4	43,882	22.0
1996	161,821	7.7	-22	45,640	22.0
1997	182,857	8.7	13	32,364	20.0
1998	198,765	9.5	9	31,085	17.0
1999	196,777	9.4	-1	33,790	17.0
2000	206,600	9.9	5	33,450	17.0
2001 *	221,975	10.6	7	35,122	17.0
2002 *	221,975	10.6	0	33,296	15.0
2003 *	229,723	11.0	3	33,296	15.0
2004 **	149,621	8.1	-35	34,458	15.0
2005 **	149,621	8.1	0	22,443	15.0
2006 **	149,621	8.1	0	22,443	15.0
2007 ***	236,600	11.3	58	22,443	15.0
2008				35,490	15.0

* Population estimate based on aerial surveys conducted in 2001/2002

**Population estimate based on aerial surveys conducted in 2004

*** Population estimate based on aerial surveys conducted in 2007

KANGAROO MANAGEMENT ZONE No. 14-UPPER HUNTER

Table 11a. WALLAROO

AVERAGE DENSITY		6.2			
AREA : Km., sq.		14,590			
STANDARD DEVIATION		1.44			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	72,000			240	
1990	99,288	6.8	38	2,400	
1991	104,160	7.1	5	2,400	2.4
1992	109,440	7.5	5	5,280	5.1
1993	109,440	7.5	0	5,280	4.8
1994	103,968	7.1	-5	5,512	5.0
1995	108,128	7.4	4	5,244	5.0
1996	84,340	5.8	-22	5,408	5.0
1997	95,304	6.5	13	4,217	5.0
1998	103,595	7.1	9	4,765	5.0
1999	102,559	7.0	-1	5,180	5.0
2000	107,650	7.4	5	5,125	5.0
2001	107,650	7.4	0	5,350	5.0
2002	107,650	7.4	0	5,350	5.0
2003 *	57,762	4.0	-46	5,350	5.0
2004 **	61,660	4.4	7	8,664	15.0
2005 **	61,660	4.4	0	9,249	15.0
2006 **	61,660	4.4	0	9,249	15.0
2007 ***	44,923	3.1	-27	9,249	15.0
2008				6,738	15.0

Table 11b. GREY KANGAROO

AVERAGE DENSITY		9.3			
AREA : Km., sq.		14,590			
STANDARD DEVIATION		2.87			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
1989	145,000	9.9			
1990	174,000	11.9	20	14,500	10.0
1991	182,700	12.5	5	17,400	10.0
1992	182,700	12.5	0	27,260	14.9
1993	191,690	13.1	5	38,338	21.0
1994	162,952	11.2	-15	38,338	20.0
1995	169,476	11.6	4	35,848	22.0
1996	132,192	9.1	-22	37,283	22.0
1997	149,377	10.2	13	26,438	20.0
1998	162,372	11.1	9	25,394	17.0
1999	160,748	11.0	-1	27,600	17.0
2000	168,750	11.6	5	27,350	17.0
2001	95,273	6.5	-44	25,313	15.0
2002	95,273	6.5	0	14,291	15.0
2003*	94,251	6.5	-1	14,291	15.0
2004 **	67,499	4.8	-28	14,138	15.0
2005 **	67,499	4.8	0	10,125	15.0
2006 **	67,499	4.8	0	10,125	15.0
2007 ***	92,016	6.3	36	10,125	15.0
2008				13,802	15.0

* Population estimate based on aerial surveys conducted in 2001/2002

**Population estimate based on aerial surveys conducted in 2004

*** Population estimate based on aerial surveys conducted in 2007

KANGAROO MANAGEMENT ZONE- South-eastern NSW

Table 12. GREY KANGAROO

AVERAGE DENSITY		11.95			
AREA : Km²		29,516			
STANDARD DEVIATION		N/A			
YEAR	POPULATION	DENSITY	%CHANGE	QUOTA	%POPULATION
2003	292,455	11.95	-	-	-
2004*	292,455	11.95	-	43,868	15.0
2005*	292,455	11.95	-	43,868	15.0
2006**	415,271	14.07	42.0	43,868	15.0
2007**	415,271	14.07	-	62,291	15.0
2008				62,291	15.0

* Population estimate based on aerial surveys conducted in 2001/2002

**Population estimate based on aerial surveys conducted in 2004

Table 13. RED AND GREY KANGAROO ANNUAL POPULATION ESTIMATES- ANNUAL QUOTAS, ANNUAL TAKE FIGURES AND RELATIVE PERCENTAGES.

	YEAR	POPULATION	QUOTA	% POPULATION	TAKE	% POPULATION	% QUOTA
*	1974	no estim.	216,000	0	95,000	0	43.98
*	1975	3,365,300	212,000	0	123,000	0	58.02
*	1976	no estim.	319,400	9.49	96,000	2.85	30.06
*	1977	4,699,000	321,000	0	167,200	0	52.09
*	1978	4,383,000	345,000	7.34	220,000	4.68	63.77
*	1979	4,288,000	645,000	14.72	520,000	11.86	80.62
*	1980	6,174,000	645,000	15.04	619,023	14.44	95.97
*	1981	7,046,000	694,500	11.25	488,647	7.91	70.36
*	1982	9,400,000	843,000	11.96	664,342	9.43	78.81
*	1983	5,500,000	843,000	8.97	400,477	4.26	47.51
**	1984	2,738,000	500,000	9.09	229,484	4.17	45.90
**	1985	4,155,000	300,000	10.96	326,028	11.91	108.68
**	1986	4,662,100	577,000	13.89	444,509	10.70	77.04
**	1987	5,425,000	577,000	12.38	473,454	10.16	82.05
**	1988	5,498,000	730,000	13.46	421,200	7.76	57.70
***	1989	7,593,500	804,000	14.62	500,355	9.10	62.23
***	1990	9,150,000	1,172,000	15.43	633,000	8.34	62.23
***	1991	9,734,000	1,520,000	16.61	856,406	9.36	56.34
***	1992	7,981,900	2,074,000	21.31	796,007	8.18	38.38
***	1993	14,618,672	1,663,600	20.84	775,220	9.71	46.60
***	1994	11,476,951	1,409,100	9.64	971,694	6.65	68.96
***	1995	12,123,100	1,146,626	9.99	977,459	8.52	85.25
***	1996	9,942,520	1,206,000	9.95	1,149,917	9.49	95.35
***	1997	12,341,062	976,000	9.82	897,937	9.03	92.00
***	1998	13,443,170	1,175,140	9.52	940,789	7.62	80.06
***	1999	12,220,865	1,532,916	11.40	937,642	6.97	61.17
***	2000	11,939,107	1,416,285	11.59	883,478	7.23	62.38
***	2001	13,982,496	1,418,212	11.88	1,169,500	9.80	82.46
***	2002	15,479,854	1,920,100	13.73	1,441,276	10.31	75.06
****	2003	8,127,976	2,083,590	13.46	996,507	6.44	47.83
****	2004	6,732,789	1,263,900	15.55	827,291	10.18	65.46
****	2005	5,514,526	1,060,083	15.75	731,772	10.87	69.03
****	2006	5,772,567	871,912	15.81	810,104	14.69	92.91
****	2007	6,286,831	909,540	15.75			
****	2008		1,001,757	15.93			

Note: above, dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF for the Western Plains.

*Based on survey of seven 1:250 000 monitor blocks. ** Based on survey of virtually all the western plains of New South Wales.

***Based on survey of virtually all of the western plains of New South Wales plus surveys of Tablelands.

****Based on survey of virtually all the western plains of New South Wales plus surveys of Tablelands and South-eastern NSW.

Table 14. SUMMARY STATISTICS COMMERCIAL TAKE- RED KANGAROO

YEAR	POPULATION EST.	QUOTA	% PREV. YEAR	TAKE	% POP.	% QUOTA
1973	no survey					
1974	no survey					
1975	2,073,000					
1976	no survey	110,000	5.3			
1977	2,669,000	150,000				
1978	2,069,000	150,000	5.6			
1979	2,355,000	300,000	14.5			
1980	3,377,000	300,000	12.7			
1981	4,626,000	333,000	9.9			
1982	5,700,000	550,000	11.9	398,200	8.6	72.4
1983	3,400,000	550,000	9.6	264,900	4.6	48.2
1984	1,650,000	270,000	7.9	158,000	4.6	58.5
1985	2,363,000	190,000	11.5	213,300	12.9	112.3
1986	2,574,000	313,000	13.2	263,000	11.1	84.0
1987	2,777,000	313,000	12.2	270,500	10.5	86.4
1988	3,440,000	354,000	12.7	218,100	7.9	61.6
1989	4,101,000	487,000	14.2	297,000	8.6	61.0
1990	4,499,000	626,000	15.3	377,200	9.2	60.3
1991	4,755,000	706,000	15.7	496,000	11.0	70.3
1992	3,348,900	956,000	20.1	412,200	8.7	43.1
1993	4,395,426	598,800	17.9	359,820	10.7	60.1
1994	3,960,106	483,850	11.0	397,791	9.1	82.2
1995	4,185,494	483,680	12.2	431,663	10.9	89.2
1996	3,787,113	507,000	12.1	531,370	12.7	104.8
1997	5,285,995	450,780	11.9	415,395	11.0	92.2
1998	5,809,757	648,560	12.3	495,100	9.4	76.3
1999	4,705,664	642,070	11.1	450,020	7.7	70.1
2000	4,391,385	590,450	12.5	389,204	8.3	65.9
2001	5,121,413	558,750	12.7	527,521	12.0	94.4
2002	4,798,558	765,900	15.0	538,856	10.5	70.4
2003	2,235,114	704,350	14.7	274,900	5.7	39.0
2004	2,508,236	379,970	17.0	244,379	10.9	64.3
2005	2,241,497	426,400	17.0	241,503	9.6	56.6
2006	2,182,788	381,054	17.0	338,631	15.1	88.9
2007	2,524,448	371,074	17.0			
2008		429,156	17.0			

Note:

1975-1983 population estimates based on survey of seven 1:250 000 monitor blocks

1984-2000 population estimates based on survey of virtually all the Western Plains

2001-2004 population estimates based on survey of virtually all the Western Plains, and incorporates revised correction factors.

Dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

Table 15. SUMMARY COMMERCIAL TAKE- EASTERN GREY KANGAROO

YEAR	POPULATION EST.	QUOTA	% PREV. YEAR	TAKE	% POP.	% QUOTA
1989*	2,035,000	222,000	15.6	121,200	8.5	54.6
1989**	500,000	222,000		136,100	9.5	61.3
1990*	2,754,800	344,000	16.9	151,100	7.4	43.9
1990**	600,000	50,000	10.0	19,700	3.9	39.4
1991*	2,957,300	488,000	17.7	245,186	8.9	50.2
1991**	630,000	60,000	10.0	9,614	1.6	16.0
1992*	2,683,000	696,300	23.5	252,100	8.5	36.2
1992**	630,000	94,000	14.9	12,300	2.0	13.1
1993*	7,077,749	624,800	23.3	164,800	6.1	26.4
1993**	661,000	132,200	21.0	119,500	19.0	90.4
1994*	4,864,482	525,000	7.4	336,288	4.8	64.1
1994**	561,900	132,200	20.0	27,371	4.1	20.7
1995*	4,800,428	350,565	7.2	317,845	6.5	90.7
1995**	584,400	123,612	22.0	52,912	9.4	42.8
1996*	3,971,575	351,402	7.3	341,789	7.1	97.3
1996**	456,000	128,598	22.0	60,567	10.4	47.1
1997*	4,432,249	300,290	7.6	270,265	6.8	90.0
1997**	515,100	91,000	20.0	63161	13.9	69.4
1998*	5,194,912	295,000	6.7	266,973	6.0	90.5
1998**	559,900	87,500	17.0	47,355	9.2	54.1
1999*	4,872,131	562,461	10.8	307,726	5.9	54.7
1999**	554,302	95,180	17.0	48,119	8.6	50.6
2000*	5,173,544	488,447	10.0	324,951	6.7	66.5
2000**	581,950	94,250	17.0	51,900	9.4	55.1
2001*	6,287,421	529,544	10.2	459,059	8.9	86.7
2001**	542,050	98,872	17.0	68,462	11.8	69.2
2002*	7,803,307	801,225	12.7	632,161	10.1	78.9
2002**	490,400	81,400	15.0	71,849	13.3	88.3
2003*	3,830,944	992,199	12.7	534,476	6.9	53.9
2003**	504,432	73,590	15.0	82,242	16.8	111.8 □
2003***	292,455	-	-	-	-	-
2004*	2,656,831	574,642	15.0	383,801	10.0	66.8
2004**	378,847	75,665	15.0	72,437	14.4	95.7
2004***	292,455	43,868	15.0	34,630	11.8	78.9
2005*	1,999,520	398,524	15.0	324,696	12.2	81.5
2005**	378,847	56,827	15.0	55,427	14.6	97.5
2005***	292,455	43,868	15.0	39,097	13.4	89.1
2006*	2,142,137	299,928	15.0	290,858	14.5%	97.0%
2006**	378,847	56,827	15.0	55,831	14.7%	98.2%
2006***	415,271	43,868	15.0	41,707	14.3%	95.1%
2007*	2,150,523	321,320	15.0			
2007**	470,226	56,827	15.0			
2007***	415,271	62,291	15.0			
2008*		322,578	15.0			
2008**		70,534	15.0			
2008***		62,291	15.0			

Quota based on a Grey Kangaroo ratio of 72:28% E/W Grey kangaroos.

1987-01 populations and quotas based on aerial surveys and counts of grey kangaroos, applying species proportions determined from ground surveys.

*Western Plains **Tablelands *** South-eastern NSW

1975-1983 population estimates based on survey of seven 1:250 000 monitor blocks

1984-2000 population estimates based on survey of virtually all the Western Plains

2001-2004 population estimates based on survey of virtually all the Western Plains, and incorporates revised correction factors.

Dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

Table 16. SUMMARY COMMERCIAL TAKE- WESTERN GREY KANGAROOS

YEAR	POPULATION EST.	QUOTA	% PREV. YEAR	TAKE	% POP.	% QUOTA
1987	806,500	75,000		62,900		83.9%
1988	626,500	105,000	13.0%	72,800	9.0%	69.3%
1989	957,500	95,000	15.2%	67,300	10.7%	70.8%
1990	1,296,400	152,000	15.9%	83,700	8.7%	55.1%
1991	1,391,700	220,000	17.0%	106,600	8.2%	48.5%
1992	1,320,000	327,700	23.5%	173,600	12.5%	53.0%
1993	2,484,496	307,800	23.3%	191,000	14.5%	62.1%
1994	2,090,463	268,050	10.8%	210,244	8.5%	78.4%
1995	2,552,778	188,800	9.0%	175,039	8.4%	92.7%
1996	1,727,832	219,000	8.6%	216,191	8.5%	98.7%
1997	2,107,718	148,000	8.6%	141,167	8.2%	95.4%
1998	1,878,601	151,700	7.2%	123,826	5.9%	81.6%
1999	2,088,768	220,119	11.7%	122,481	6.5%	55.6%
2000	1,792,228	216,553	10.4%	107,902	5.2%	49.8%
2001	2,031,612	203,556	11.4%	145,787	8.1%	71.6%
2002	2,387,589	271,575	13.4%	183,513	9.0%	67.6%
2003	1,265,031	313,378	13.1%	104,889	4.4%	33.5%
2004	896,420	189,755	15.0%	92,044	7.3%	48.5%
2005	602,208	134,463	15.0%	71,049	7.9%	52.8%
2006	653,524	90,234	15.0%	83,077	13.8%	92.1%
2007	726,363	98,029	15.0%			
2008		98,029	15.0%			

1987-04 populations and quotas based on aerial survey counts of grey kangaroos, applying species proportions determined from ground surveys.

1975-1983 population estimates based on survey of seven 1:250 000 monitor blocks

1984-2000 population estimates based on survey of virtually all the Western Plains

2001-2004 population estimates based on survey of virtually all the Western Plains, and incorporates revised correction factors.

Dark shading indicates the use of September 2003 100m CF; light shading indicates 200m CF.

Table 17. SUMMARY COMMERCIAL TAKE- WALLAROOS (Northern Tablelands)

YEAR	POPULATION EST.	QUOTA	% PREV. YEAR	TAKE	% POP.	% QUOTA
1979		5,000				
1980		5,000				
1981		5,000				
1982		5,000		2,066		41.3%
1983		5,000		714		14.3%
1984		1,000		632		63.2%
1985		1,000		763		76.3%
1986		0		0		
1987		0		0		
1988		0		0		
1989	300,000	1,000		97		9.7%
1990	413,700	10,000	3.3%	1,967	0.7%	19.7%
1991	434,000	10,000	2.4%	1,378	0.3%	13.8%
1992	456,000	22,000	5.1%	1,377	0.3%	6.3%
1993	456,000	22,000	4.8%	1,678	0.4%	7.6%
1994	433,200	17,600	3.9%	3,431	0.8%	19.5%
1995	450,528	17,700	4.1%	7,949	1.8%	44.9%
1996	351,414	22,300	4.9%	6,530	1.4%	29.3%
1997	397,096	17,780	5.1%	6,323	1.8%	35.6%
1998	431,879	19,900	5.0%	5,035	1.3%	25.3%
1999	427,559	21,586	5.0%	5,490	1.3%	25.4%
2000	448,750	21,355	5.0%	6,562	1.5%	30.7%
2001	448,750	22,330	5.0%	9,053	2.0%	40.5%
2002	448,750	22,330	5.0%	6,615	1.5%	29.6%
2003	220,738	22,330	5.0%	13,388	3.0%	60.0%
2004	208,104	33,111	15.0%	15,304	6.9%	46.2%
2005	208,104	31,216	15.0%	21,299	10.2%	68.2%
2006	208,104	31,216	15.0%	24,540	11.8%	78.6%
2007	114,966	31,216	15.0%			
2008		17,245	15.0%			

1979-85, whole of commercial zone.

1989-2000, Tablelands only.

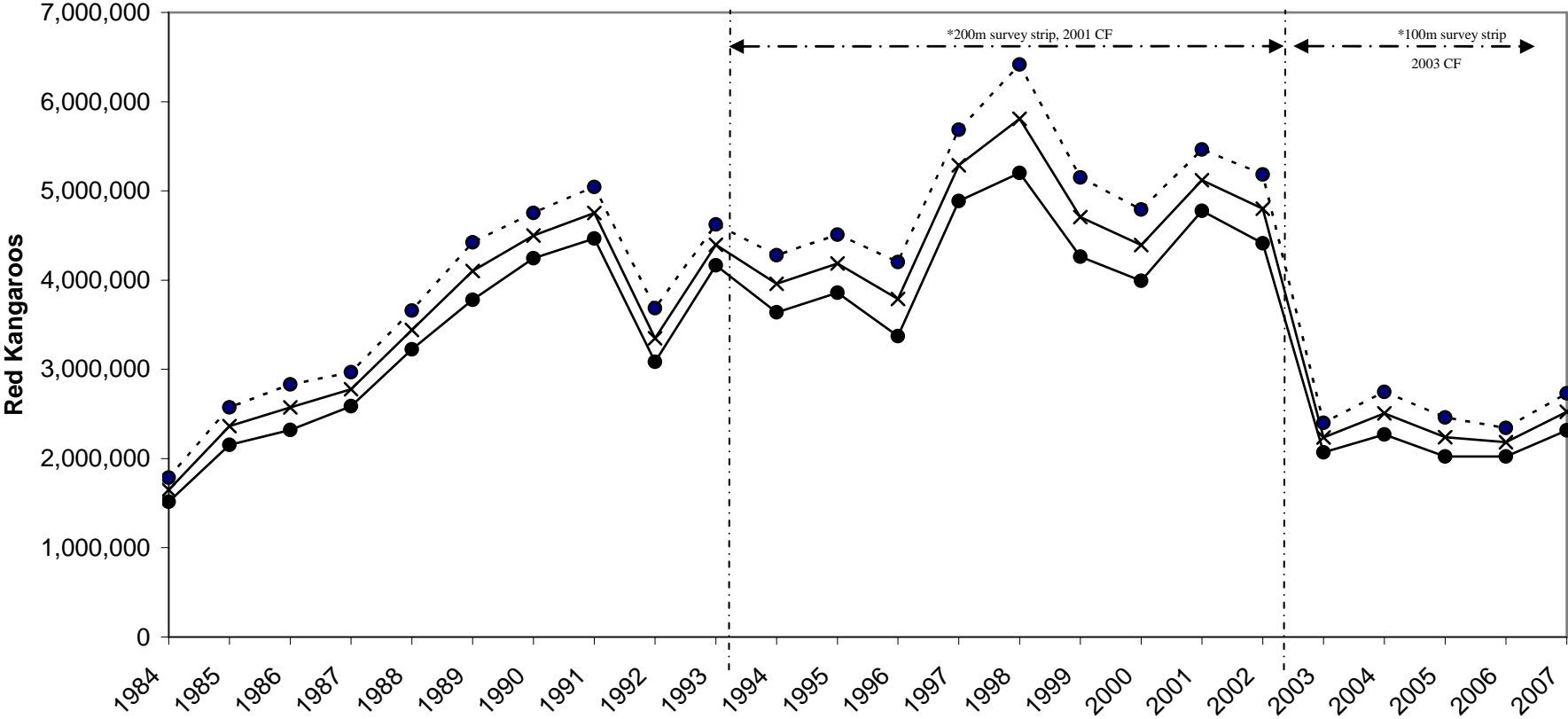
2001, helicopter survey of Tablelands.

2004, helicopter survey of Tablelands.

2007, helicopter survey of Tablelands.

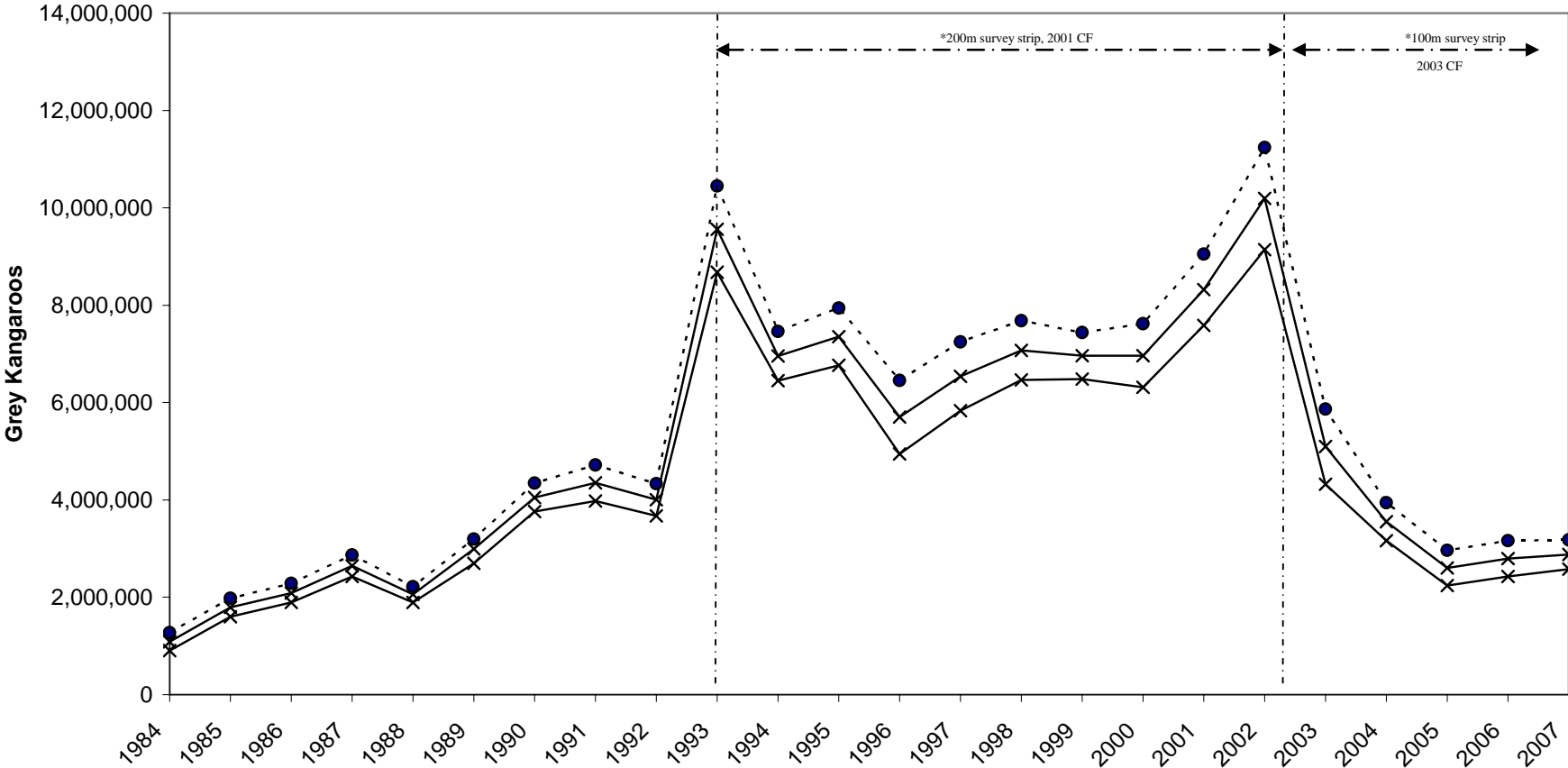
2004, quota changed from 5% to 15% in line with KMP 2002-2006.

Figure 1. Population trends in red kangaroos New South Wales



Trends in estimated numbers (+/-std. errors) of red kangaroos on the Western Plains of NSW between 1984 and 2007

Figure 2. Population trends in grey kangaroos New South Wales



Trends in the estimated numbers (+/-std. errors) of grey kangaroos on the Western Plains of NSW between 1984 and 2007

Figure 3. NSW combined red and grey kangaroo population estimates, authorised quota & actual take 1973-2008

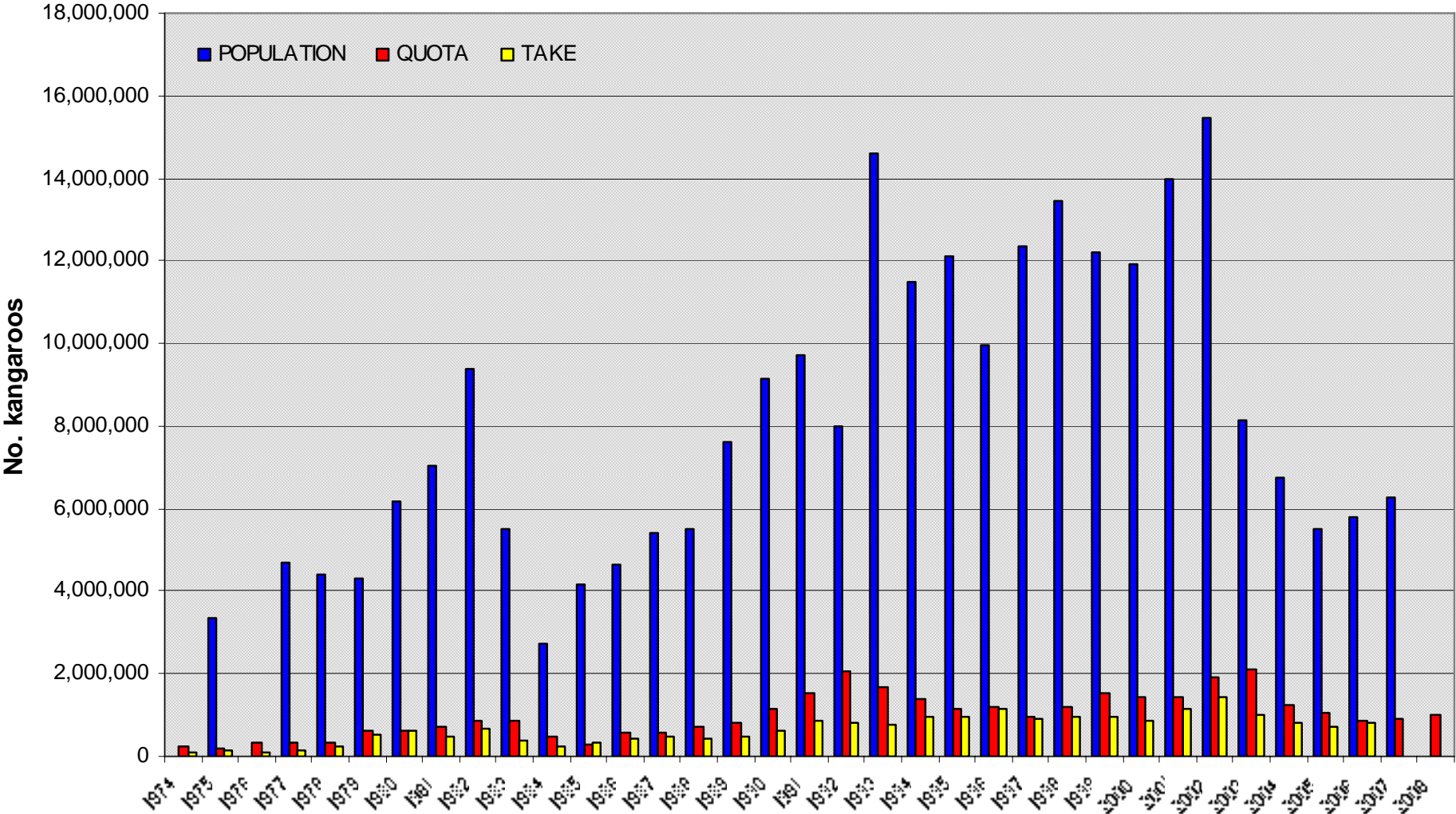


Figure 4. NSW red kangaroo quotas and take 1982-2008

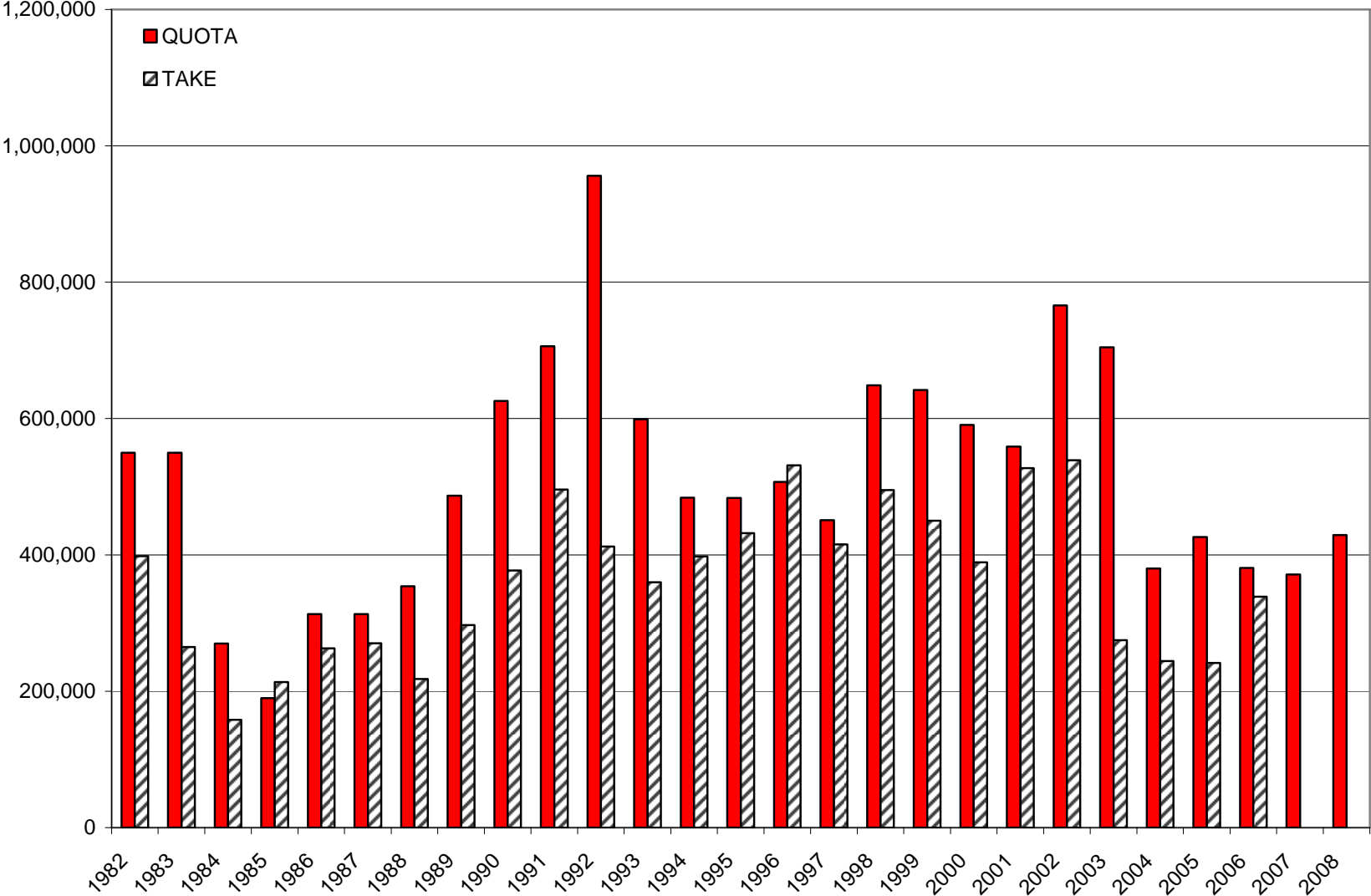


Figure 5. NSW eastern grey kangaroo quotas and take 1987-2008

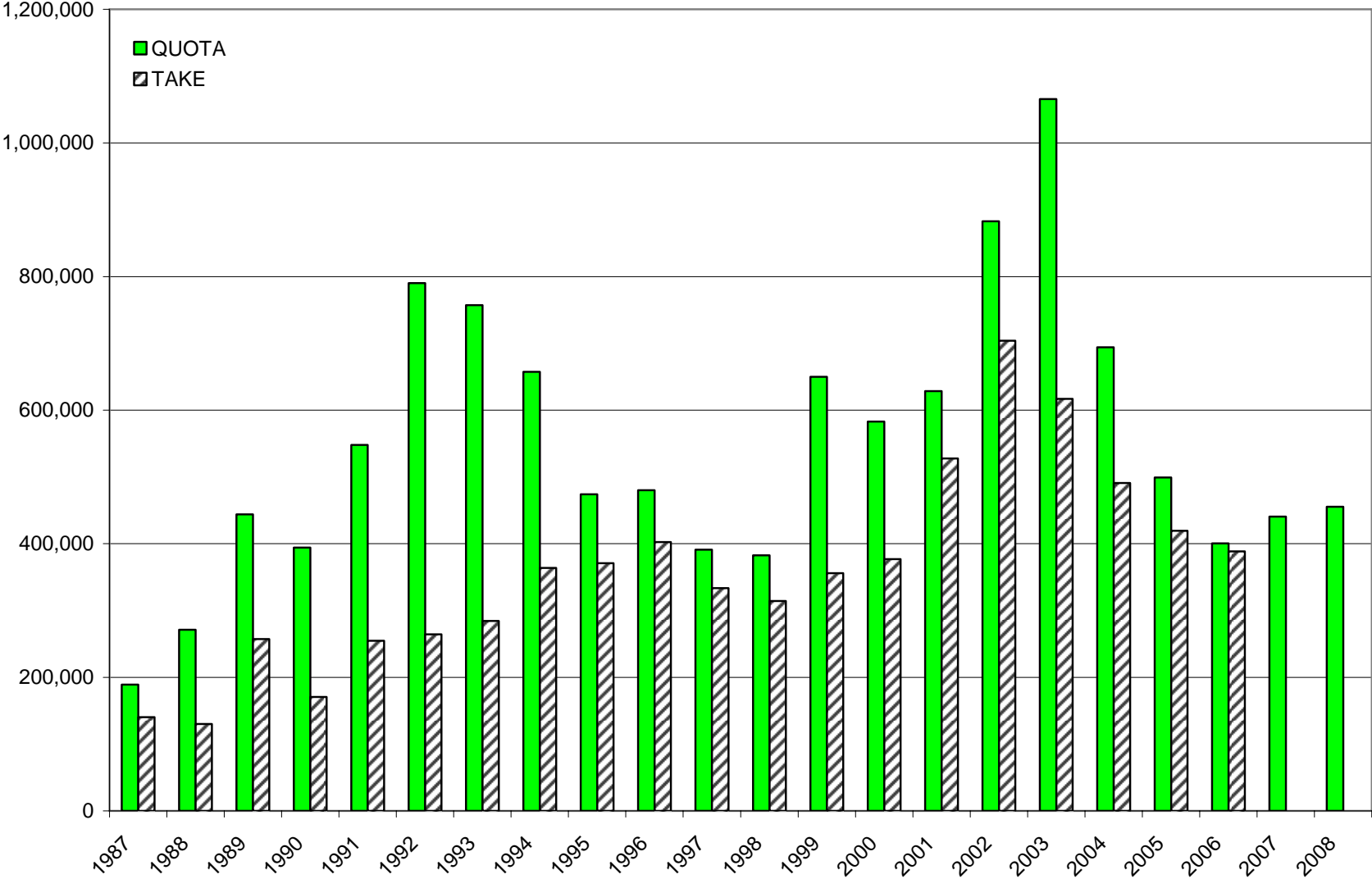


Figure 6. NSW western grey kangaroo quotas and take 1987-2008

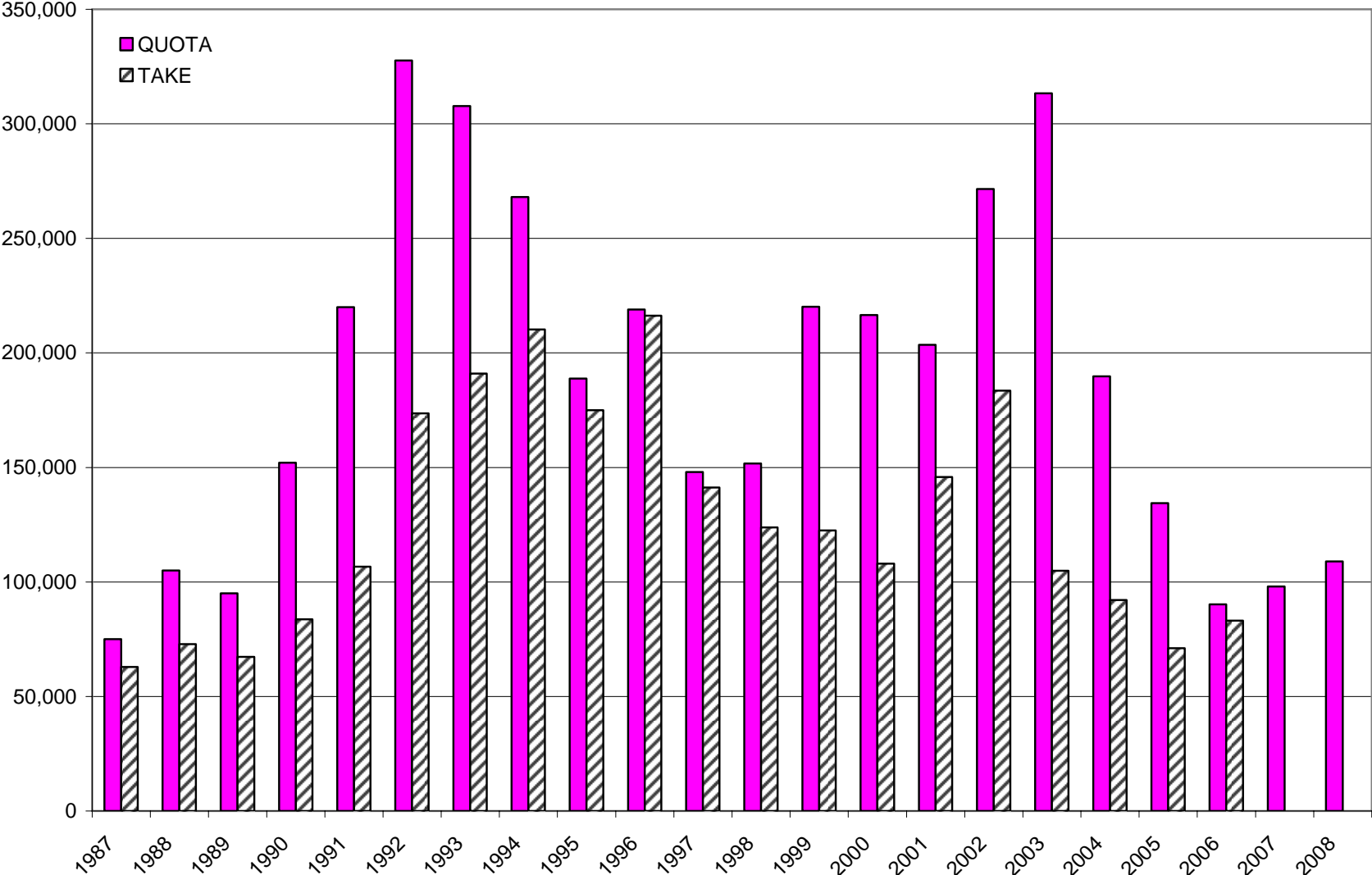


Figure 7. NSW wallaroo quotas and take 1987-2008

