

Report

Final

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Review of the South Australian Commercial Kangaroo Management Plan 2020–2024

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Executive summary

Background

This report presents the findings from the review of the implementation of the South Australian Commercial Kangaroo Management Plan 2020–2024 (the plan). The plan was prepared pursuant to section 60I of the *National Parks and Wildlife Act 1972* and allows for the harvesting of several common kangaroo species in South Australia. The plan also satisfies the requirements of the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*. The scope of this review is to evaluate progress against the current plan and provide recommendations for the next kangaroo management plan based on the review.

The goal of the plan is 'to provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development'. It also has a goal to provide an alternative management option for reducing the damage caused by overabundant kangaroos. To achieve its goals, the plan defines 7 aims and 29 actions and lists 61 performance indicators (PIs) to track implementation progress.

The review comprised 3 inter-related components:

1. **Internal review** by DEW staff of progress against the plan's PIs
2. **External survey** involving key stakeholders
3. **Independent review** by an external consultant.

Internal review

The results of the internal review were provided to the external consultant and used as core input to the independent review. Also as part of this component, DEW engaged with the Kangaroo Management Reference Group (KMRG) to obtain input on the question: What are the key emerging issues or challenges for the next 5 years that changes to the new kangaroo management plan would support? The high-level feedback received from KMRG is provided in this report.

External survey

The external survey comprised 22 online questions and had the aim to find out what worked well in the plan and what needs to be improved for the next plan. The survey received 25 responses, of which 52% identified as kangaroo industry permit holders. Most respondents (96%) indicated that they were aware of the plan, although few respondents indicated that they used the plan frequently. When asked whether the plan had met its goal, 60% of respondents agreed or strongly agreed that the goal had been met. There were also questions around the use of the Kangaroo Conservation and Management webpage and which documents that respondents had accessed from it, and around the preferred method of communication with the Kangaroo Management Program in the Department for Environment and Water (DEW).

The external survey asked respondents to indicate whether they considered the management practices established in the plan were effective at minimising potential negative impacts of commercial harvesting on kangaroos. With respect to the potential impact of overharvesting of kangaroos and the mitigating practice of annual population monitoring, setting sustainable quotas and suspending harvest when kangaroo populations are low, 71% agreed or strongly agreed that the practice was effective at minimising the impact. With respect to the potential impact of inhumane destruction of kangaroos and the mitigating practice of requiring shooters to comply with the requirements of the National Code of Practice for Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020), requiring a shooting accuracy test before issuing permits, and unannounced inspections of field chillers, 75% agreed or strongly

agreed that the practice was effective at minimising the impact. Respondents provided written responses as reasons for their answers to these questions and these are summarised in this report.

When asked whether they believed that DEW adequately investigates reports of non-compliant activities relating to kangaroo management, 48% believed that DEW's investigations were adequate and 52% believed they were not adequate. When asked whether they believed that the commercial kangaroo industry is effective at reducing kangaroo numbers as part of managing total grazing pressure on properties, 46% believed that it is effective and 46% believed it is not effective. Extensive written comments were received to explain the responses to these questions and these are summarised in this report.

Finally, survey respondents were asked whether they were aware of any knowledge gaps in kangaroo management that they believe require more research and whether they had any further comments; the written responses are summarised in this report.

Independent review

The independent review consolidated and analysed information from the internal review and external survey, collected evidence to inform an independent assessment of progress against the plan's PIs, and prepared this independent review document, which includes recommendations for the next plan.

For each PI, an assessment was done of whether the PI was achieved, partially achieved or not achieved. In total, of the 61 PIs, 41 (67%) were considered achieved, 10 (16%) partially achieved and 7 (11%) not achieved with no progress made; 3 (5%) were flagged as being unable to be assessed or in progress.

Particular strengths in achievements against actions and PIs are in the areas of ensuring compliance with the Commercial Code, provision of information, progress on educating DEW regional staff and landholders about using commercial harvest as a land management option, and monitoring kangaroo populations and setting quotas according to established processes and protocols. Weaknesses in achievement are in the lack of a communication strategy, limited engagement with Aboriginal stakeholders (although there has been an Aboriginal representative as a member of KMRG during the plan period), and only partial achievement of the established PIs for compliance inspections of field chillers and kangaroo processing works.

Overall there has been good progress towards the overall goal to 'provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development' and towards the goal to 'provide an alternative management option for reducing the damage caused by overabundant kangaroos'.

Recommendations

To inform the development of the next kangaroo management plan, 40 recommendations are provided. They include general recommendations around the development of performance indicators, specific recommendations around high-level goals (including a recommendation to retain the high-level commitment to providing alternative management options for reducing the damage caused by overabundant kangaroos in the new plan), and a series of detailed recommendations relating to the aims, actions and PIs in the plan.

1 Background

Commercial harvesting of protected animals is allowed in South Australia under Division 4B of the *National Parks and Wildlife Act 1972* (NPW Act). Under section 60I of the NPW Act, for harvesting to occur a plan of management must be prepared in relation to the harvesting of each species of protected animal.

Pursuant to section 60I, the **South Australian Commercial Kangaroo Management Plan 2020–2024** (the plan) allows for the harvesting of the following common kangaroo species in South Australia:

- red kangaroo (*Macropus rufus*)
- western grey kangaroo (*M. fuliginosus*), including the Kangaroo Island subspecies (*M. fuliginosus fuliginosus*) and the mainland subspecies (*M. fuliginosus melanops*)
- euro (*M. robustus*)
- tammar wallaby (*M. eugenii*)
- eastern grey kangaroo (*M. giganteus*)
- other species as per relevant legislative amendment subsequent to the commencement of the plan.

The plan was developed to guide the sustainable management of commercially harvested kangaroos in South Australia. The plan satisfies the requirements of the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as a Wildlife Trade Management Plan and meets community expectations that kangaroo harvesting methods will not breach the *Animal Welfare Act 1985*. The plan also puts in place measures to ensure that kangaroos are harvested in accordance with the National Code of Practice for Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020).

The plan is current for a maximum five-year period from 1 January 2020 to 31 December 2024, as per the requirements of the EPBC Act.

The goal of the plan is 'to provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development'. It also has a goal to provide an alternative management option for reducing the damage caused by overabundant kangaroos. To achieve its goals, the plan defines 7 aims and 29 actions and lists 61 performance indicators (PIs) to track implementation progress. The 7 aims are:

1. Ensure humane harvest of kangaroos
2. Promote community awareness and participation
3. Manage impacts of kangaroos on land condition
4. Monitor kangaroo populations and set quotas
5. Monitor industry compliance
6. Facilitate adaptive management and research
7. Undertake program reporting and review.

The 2020–2024 plan contained some important changes from previous versions, especially:

- The commercial harvesting zone was expanded across the entire state, with the exception of the Alinytjara Wilurara region and metropolitan Adelaide. This expansion involved 4 new commercial harvest sub-regions (CHSRs) being established (Hills and Fleurieu (excluding metropolitan Adelaide), Kangaroo Island, Lower South East and Upper South East) and extensions to the existing

Murray Mallee and Mid North sub-regions to include Murray Plains, and Yorke Peninsula and Lower North respectively.

- The species available for harvest was expanded from 3 species (red, western grey and euro) to the list above.

Under Aim 7 of the plan, Action 29 states that the Department for Environment and Water (DEW) will commence a review of the implementation of the plan no later than 12 months before the expiry of this plan. This document provides a report on that review and outlines findings and recommendations for improvements in the subsequent plan.

2 Scope and goals of the review

The scope of this review is to evaluate progress against the current plan and provide recommendations for the next plan based on the review.

The goal of the review is to meet the requirements of Action 29 of the plan and the following PIs:

29.1 The success of the current plan in achieving its goal is self-assessed by DEW, measuring the department's performance against the performance indicators in the plan.

29.2 DEW will commence a review of the plan by November 2023.

29.3 DEW submits a report on the results of the review to the Commonwealth ... by 31 October 2024.

Table 1 lists areas that are excluded from the scope of this review. Any information collected that is outside the scope was recorded for consideration at a later time, if relevant.

Table 1: Exclusions from the scope of this review of the plan

Exclusion	Description
Changes to species available for harvest	This review is not considering the species available for harvest under the plan.
Management of the non-commercial destruction of kangaroos	Non-commercial destruction of kangaroos is regulated under a different part of the NPW Act from commercial harvest (Permit to Destroy Wildlife under section 53(1)(c)); therefore, this review does not consider regulatory aspects of the non-commercial destruction, although it does consider strategies around commercial and non-commercial destruction where it intersects with the goal and aims of the plan.
Changes to the NPW Act and associated regulations	This review will not include discussion of any changes to the NPW Act or associated regulations.
Assessment of whether the commercial harvest of kangaroos should occur	The high-level remit for the commercial harvest of kangaroos is established in the NPW Act and will not be discussed in this review.
Technical review of the methods used to implement the plan (e.g. kangaroo surveys, quota setting and population modelling)	This review includes an assessment of whether the deliverables in actions and PIs have been achieved; it does not include a technical review of the methods used and results achieved.

The review comprised 3 inter-related components:

1. **Internal review** by DEW staff of progress against the plan's PIs
2. **External survey** involving key stakeholders to find out what worked well in the plan and what needs to be improved for the next plan
3. **Independent review** by an external consultant to consolidate information collected, collect evidence for progress against the plan, interview key DEW staff, assess achievement against PIs, and provide recommendations.

3 Methods

The methods used for the 3 inter-related components outlined above (internal review, external stakeholder survey and independent review) are described below.

Internal review

Relevant staff in DEW collaborated to consider the 61 PIs in the plan and determine a self-assessment of whether each was achieved, partially achieved or not achieved. To provide justification of the assigned achievement rating, comments were documented for each PI and additional documentation was attached for some PIs.

This internal review was provided to the external consultant as core input to the independent review.

During the period of the internal review, DEW also engaged with the Kangaroo Management Reference Group (KMRG) at its meeting on 19 April 2024, to obtain their input on the question: What are the key emerging issues or challenges for next 5 years that changes to the new kangaroo management plan would support? This differed from the process followed during the previous review, when the KMRG was specifically invited to comment on DEW's internal performance assessment. Nevertheless, areas of discussion by KMRG are included in this report, as this has some relationship to lessons learned during implementation of the plan that is under review.

External survey

An online survey of key stakeholders was conducted, with the aim to find out what worked well in the plan and what needs to be improved for the next plan.

The survey comprised 22 questions and focused on the awareness and use of the current plan, communication and information around the kangaroo management program, the effectiveness of management practices at mitigating potential negative impacts of harvesting on kangaroo populations, DEW's investigation of non-compliant activities, the effectiveness of the commercial kangaroo industry at reducing total grazing pressure, and knowledge gaps.

The survey is provided in Appendix 3.

The survey was distributed widely to external stakeholders and within DEW, including to:

- kangaroo industry permit holders
- KMRG members and deputy members
- Livestock SA
- RSPCA
- conservation groups
- landscape boards
- key DEW staff (including district rangers, parks and wildlife managers, conservation ecologists, pastoral unit)
- Ikara-Flinders Ranges Co-Management Board.

The survey was open online between 20 March and 5 April 2024.

Independent review

The independent review undertaken by the external consultant had 3 components:

1. Consolidate and analyse information from the internal review and external survey
2. Collect evidence to inform an independent assessment of progress against the plan's PIs
3. Prepare an independent review document that includes recommendations for the next plan, based on the review.

The external consultant also contributed to the development of the questions for the external survey.

Consolidate and analyse information

The DEW internal review was analysed to identify the number of PIs that were self-assessed as achieved, partially achieved and not achieved, grouped under the plan's actions and aims. The comments and documentation that were included with the internal review were used to inform the independent assessment of progress; these are not reproduced in this report.

The data collected from the external survey were analysed using descriptive statistics, charts and tables to summarise results for each question and draw out any findings that may be of particular relevance to assessing performance against the current plan and/or informing the new plan.

Collect evidence for an independent assessment

This component comprised the following steps:

1. Analysis of the internal review to identify PIs for which sufficient evidence had been provided to enable a confident assessment of achievement
2. Identification of gaps in information provided – that is, PIs that could not be assessed using provided evidence
3. A 2-hour meeting with DEW Kangaroo Management Program staff to discuss the identified gaps, collect relevant documentation or other evidence, and clarify aspects of the reporting received and the operations of the Kangaroo Management Program
4. Assessment of the achievement of each PI (achieved, partially achieved or not achieved) and documentation of how each was verified.

Independent review document

This report is the independent review document, presenting the results of all components of the review.

During development of this report, interviews were held with DEW staff to discuss their perceptions of overall progress against the plan, highlights and weaknesses, reasons for any challenges, and future directions in the kangaroo management program that are relevant to this review.

4 Results

Internal review

The internal self-assessment was provided to the external consultant as core input to the independent review. Feedback that was received from KMRG members as part of the internal review is provided in Appendix 4. All KMRG members also received the external review survey and it is believed that some members completed it; however, as this was not formally in their role as KMRG, their feedback is not considered in this section.

External survey

Respondents

The external online survey received 25 responses. Respondents were asked (Question 2) to indicate which sector or interest group they represented for the purpose of the survey. The breakdown is shown in Table 2; 13 respondents (52%) identified as kangaroo industry permit holders.

Table 2: Breakdown of respondents into the sector or interest group that they represented for the purpose of the survey (Question 2)

Sector / interest group	No. respondents
First Nations interests	0
Animal welfare interests	1
Environmental conservation interests	3
Kangaroo industry permit holders	13
Landholder or land manager	3
Government	5
TOTAL	25

The number of responses is fewer than were received in the 2017 review, when 36 responses were received. The same number of permit holders (13) responded in both years; the major difference was that the 2017 survey received responses from 14 landholders compared with only 3 in this survey.

Kangaroo Management Plan

Respondents were asked (Question 3) to indicate whether they were aware of the South Australian Commercial Kangaroo Management Plan 2020–2024 and, if they answered yes, how often they read or consulted the plan (Question 4).

Twenty-four respondents (96%) indicated that they were aware of the plan. This level of awareness was slightly higher than the response in the 2017 review, in which 92% of respondents were aware of the plan.

Table 3 shows the breakdown of respondents regarding how often they read or consulted the plan. Twelve respondents (50% of the 24 who indicated that they were aware of the plan) said that they rarely or never read or consulted the plan and 5 (21%) said that they read or consulted the plan weekly or monthly.

Table 3: Breakdown of responses to Question 4 ‘How often do you read or consult the plan?’

Frequency	No. respondents
Weekly	1
Monthly	4
Yearly	7
Rarely	11
Never	1
TOTAL	24

To assess perceptions regarding the overall success of the plan, respondents were asked (Question 5) to what extent they agreed that the plan has met its goal to ‘provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development’.

Table 4 shows the breakdown of responses to this question. Fifteen respondents (60%) agreed or strongly agreed that the plan had met its goal, 7 (28%) disagreed or strongly disagreed, and 3 (12%) were unsure.

Table 4: Breakdown of responses to Question 5 ‘To what extent has the plan achieved its goal?’

Response	No. respondents
Strongly agree	3
Agree	12
Not sure	3
Disagree	5
Strongly disagree	2
TOTAL	25

To collect information underpinning the responses to the question regarding the achievement of the plan’s goal, participants were asked (Question 6) to explain the reasons for their answer. The 19 written responses received are summarised in Table 12 (in Appendix 1).

These questions were not asked in the 2017 survey, therefore there is no comparison to be made.

Communication and information

DEW maintains a Kangaroo Conservation and Management webpage that is intended as a key portal for communication between DEW and external stakeholders. To assess the use of this webpage, respondents were asked (Question 7) to indicate whether they were aware of it and, if yes, which documents they had accessed from it (Question 8).

Of the 24 responses received to this question, 18 respondents (75%) were aware of the webpage and 6 (25%) were unaware. This awareness was slightly higher than the response in the 2017 review, in which 67% of respondents were aware of the webpage.

Table 5 shows the number of respondents who indicated that they had awareness of or had downloaded each of the document types available on the webpage. This shows that the webpage was actively used, in particular with 15 respondents (60% of participants) being aware of or downloading Quota Reports and 13 (52%) being aware of or downloading Harvest Reports, the plan and permit application forms.

Table 5: Breakdown of responses to Question 8 ‘Which of the following documents are you aware or have accessed on the Kangaroo Conservation and Management webpage?’

Document	No. respondents
Harvest Report	13
Quota Report	15
Fact sheet: Kangaroo Management Information for Landholders	9
Fact sheet: Kangaroo Management Field Processor Factsheet	10
SA Commercial Kangaroo Management Plan 2020–2024	13
Landholder consent form (to allow kangaroo harvesting on property)	11
Permit application form	13
Review of the previous kangaroo management plan	7

Respondents were asked (Question 9) to indicate whether they used the webpage to stay up to date about new information regarding kangaroo management (e.g. harvest quotas). Of the 24 responses received, 11 (46%) said they did use the webpage for this purpose and 13 (54%) said that they did not; this represents a higher level of use of the webpage than in the 2017 survey, when only 14% indicated that they used it for this purpose.

When asked to indicate their preferred method of communication with the Kangaroo Management Program (Question 10), 32 responses were received, 19 of which (59%) nominated email and 10 of which (31%) nominated phone; only 2 respondents (6%) nominated the webpage. Table 6 provides the results for this question. The results are similar to those in 2017, when email and phone were also the most preferred methods (53% and 25% respectively).

Table 6: Breakdown of responses to Question 10 ‘What is your preferred method of communication with the Kangaroo Management Program?’

Method	No. responses
Email	19
Phone	10
Webpage	2
Other	1
TOTAL	32

Respondents were asked (Question 11) whether they were aware that the commercial harvest boundaries are available on DEW’s free online mapping tool NatureMaps and, if yes, whether they use the mapping tool (Question 12). Of the 24 responses received to Question 11, 15 (63%) were aware of the boundaries being available on NatureMaps, although only 6 of the 18 respondents (33%) to Question 12 indicated that they used the mapping tool. Table 7 shows the results for these questions.

Table 7: Responses to Questions 11 and 12 regarding awareness of and use of NatureMaps

Method	Yes	No	Total
Are you aware that the commercial harvest boundaries are available on DEW’s free online mapping tool NatureMaps?	15	9	24
If you answered yes, do you use the mapping tool? ¹	6	12	18

¹ Although the wording was ‘If you answered yes’, 18 responses were received despite 15 indicating that they were not aware; it is likely that 3 respondents answered ‘No’ to both Questions 11 and 12.

Managing potential negative impacts

The plan identifies potential negative impacts of commercial harvesting on kangaroos and DEW aims to minimise the risk of these impacts through the use of specific management practices. To explore the perceived effectiveness of these practices through the plan, survey respondents were asked to respond to questions around the effectiveness of management practices to mitigate 2 impacts identified in the plan, as described below.

Impact: Overharvesting of kangaroos.

Management practice: Kangaroo populations are annually monitored, sustainable quotas are set based on population estimates and harvesting is suspended when kangaroo populations are low (below the low population threshold).

Respondents were asked whether they think this practice is effective at minimising the impact (Question 13) and to explain the reasons for their answer (Question 14). Table 8 provides a breakdown of the responses to Question 13. Of the 24 responses received, 17 (71%) agreed or strongly agreed that the practice was effective at minimising the impact and 4 (17%) disagreed or strongly disagreed; 3 respondents (13%) were not sure.

Table 8: Breakdown of responses to Question 13 regarding whether the identified management practice was effective at mitigating the risk of overharvesting of kangaroos

Response	No. respondents
Strongly agree	6
Agree	11
Not sure	3
Disagree	2
Strongly disagree	2
TOTAL	24

The 15 written responses received to Question 14 as reasons for respondents' responses to Question 13 are summarised in Table 12 (in Appendix 1).

Impact: Inhumane destruction of kangaroos.

Management practice: Kangaroo field processors (shooters) must comply with the requirements of the National Code of Practice for Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020) as a condition of their permit and must pass a shooting accuracy test before being issued a permit. Unannounced inspections of field chillers are routinely carried out by DEW wardens to ensure kangaroos have been shot as per the Code.

Respondents were asked whether they think this practice is effective at minimising the impact (Question 15) and to explain the reasons for their answer (Question 16). Table 9 provides a breakdown of the responses to Question 15. Of the 24 responses received, 18 (75%) agreed or strongly agreed that the practice was effective at minimising the impact and 3 (13%) disagreed or strongly disagreed; 3 respondents (13%) were not sure.

Table 9: Breakdown of responses to Question 15 regarding whether the identified management practice was effective at mitigating the risk of inhumane destruction of kangaroos

Response	No. respondents
Strongly agree	10
Agree	8
Not sure	3
Disagree	1
Strongly disagree	2
TOTAL	24

The 21 written responses received to Question 16 as reasons for respondents' responses to Question 15 are summarised in Table 12 (in Appendix 1).

Investigation of non-compliant activities

Survey respondents were asked (Question 17) whether they believed that DEW adequately investigates reports of non-compliant activities relating to kangaroo management and to provide reasons for their answer (Question 18).

Of the 23 responses to Question 17, 11 (48%) believed that DEW adequately investigates reports of non-compliant activities and 12 (52%) believed that DEW's investigations were not adequate. These results show a slightly lower percentage of respondents believing that DEW adequately investigates reports of non-compliance than in 2017, when 55% of respondents believed that investigations were adequate.

The 19 written responses to Question 18 received as reasons for respondents' responses are summarised in Table 12 (in Appendix 1).

Reduction of total grazing pressure

Survey respondents were asked (Question 19) whether they believed that the commercial kangaroo industry is effective at reducing kangaroo numbers as part of managing total grazing pressure on properties and to provide reasons for their answer (Question 20).

Of the 24 responses to Question 19, 11 (46%) believed that the commercial kangaroo industry is effective at reducing kangaroo numbers as part of managing total grazing pressure and 11 (46%) believed it is not effective; 2 (8%) were not sure. The 21 written responses to Question 20 received as reasons for respondents' responses are summarised in Table 12 (in Appendix 1). Despite the even number of 'Yes' and 'No' answers, the written responses tend to show more strongly held views that the commercial kangaroo industry is not effective at reducing kangaroo numbers as part of managing total grazing pressure (Table 12).

Knowledge gaps

Survey respondents were asked (Question 21) whether they were aware of any knowledge gaps in kangaroo management that they believe require more research. The 17 written responses received are summarised in Table 12 (in Appendix 1).

Further comments

Survey respondents were asked (Question 22) whether they had any further comments. The 15 written responses received are summarised in Table 12 (in Appendix 1).

Independent review

The independent detailed ‘traffic light’ analysis for each of the 61 PIs is provided in Table 13 (in Appendix 2). The ratings are summarised in Table 10, which shows the number of PIs considered achieved, partially achieved and not achieved, grouped under each of the plan’s 29 actions, and in Table 11, grouped under each of the 7 aims.

In total, of the 61 PIs, 41 (67%) were considered achieved, 10 (16%) partially achieved and 7 (11%) not achieved with no progress made; 3 (5%) were flagged as being unable to be assessed or in progress (see Table 13 for explanations).

Table 10: Summary of the independent assessment of achievement against performance indicators in the plan, grouped under each action; the total number of indicators for each action is shown in the right-hand column and the total indicators considered ‘Achieved’, ‘Partially achieved’, ‘Not achieved’ and ‘Unable to assess / In progress’ is shown in the bottom row

Aim	Action	No. performance indicators				
		Achieved	Partially achieved	Not achieved	Unable to assess / In progress	Total
1. Humane Treatment of Kangaroos	1. DEW staff will monitor compliance with the Commercial Code by commercial kangaroo industry operators.	1				1
	2. DEW will promote research opportunities into improving animal welfare outcomes.	1	1			2
2. Promote community awareness and participation	3. Members of the Kangaroo Management Reference Group will be provided with information and afforded the opportunity to advise DEW on kangaroo management issues throughout the life of this plan.	2				2
	4. Public documents will be made available on the Kangaroo Conservation and Management webpage.	1	1		1	3
	5. Where appropriate, DEW staff will participate in media interviews and prepare media releases.	2				2
	6. Information about the Kangaroo Management Program and other information will be developed as required and distributed to stakeholders.	1		1		2
	7. Involve Aboriginal stakeholders in the implementation of this plan.		1	2		3
3. Manage impacts of kangaroos on land condition	8. Educate DEW regional staff and land managers on best practice for combining the use of commercial and non-commercial options for kangaroo management.	2	1	1		4
4. Monitor kangaroo populations	9. Population estimates will be obtained using a combination of standard survey method and population model.	2				2

Aim	Action	No. performance indicators				
		Achieved	Partially achieved	Not achieved	Unable to assess / In progress	Total
and set quotas	10. A risk-based approach is used for determining which Commercial Harvest Sub-Regions are surveyed each year.	1				1
	11. Sustainable commercial kangaroo harvest quotas will be set annually per Commercial Harvest Sub-Region for each species.	4				4
	12. Surveys will be reduced or stopped in CHSRs with a consistently low harvest and will start again once the harvest has reached the low harvest threshold.	3				3
	13. When kangaroo populations decline to specific thresholds (low abundance thresholds), the commercial harvest of these particular species in the particular Commercial Harvest Sub-Regions will be reduced or suspended.	1				1
	14. Special Land Management Quota will be set annually.	1				1
	15. Population estimates and quotas will be reported annually in Quota Report.	3	1			4
	16. Kangaroo populations will be monitored indirectly throughout the life of this plan.	2				2
5. Monitor industry compliance	17. All activities are permitted in accordance with South Australian legislation and DEW policy.		1			1
	18. DEW will ensure that permit conditions are adequate and reflect current South Australian legislation, DEW policy and this plan.	2				2
	19. DEW will consider improvements to the sealed tag system as appropriate.	1				1
	20. DEW staff will undertake both regular and opportunistic monitoring of compliance by commercial kangaroo industry operators.		2	1		3
	21. DEW will ensure that all Kangaroo Field Processors are competent to achieve the standards set out in the Commercial Code, and other necessary requirements.	2				2
	22. Activities not following South Australian legislation will be investigated and where an offence has been committed, appropriate compliance action will be taken.	1				1
	23. The accuracy of industry returns will be continually monitored during the life of this plan.	1				1

Aim	Action	No. performance indicators				
		Achieved	Partially achieved	Not achieved	Unable to assess / In progress	Total
	24. A compliance database will be maintained to support investigations, inspections, and audits.	1				1
6. Facilitate adaptive management and research	25. During the life of this plan, further research using the population model (referred to in Aim 4) will be conducted to define ecologically sustainable kangaroo densities for CHSRs, which will replace the average population estimate as the trigger for releasing HAQ.	1		1		2
	26. Where practicable, adaptive management experiments will be performed to test deliberate management interventions during the life of this plan.	3			1	4
	27. Where knowledge gaps exist, DEW will facilitate research into the biology and ecology of commercially harvested kangaroo species.		1			1
7. Undertake program reporting and review	28. An annual report on the South Australian Commercial Kangaroo Management Plan 2020–2024 will be prepared and submitted to the Commonwealth.	1	1			2
	29. The review of the South Australian Commercial Kangaroo Management Plan 2020-2024 will commence no later than 12 months before the expiry of this plan.	1		1	1	3
	Total	41	10	7	3	61

Table 11: Summary of the independent assessment of achievement against performance indicators in the plan, grouped under each aim; the total number of indicators for each aim is shown in the right-hand column and the total indicators considered 'Achieved', 'Partially achieved', 'Not achieved' and 'Unable to assess / In progress' is shown in the bottom row

Aim	No. performance indicators				
	Achieved	Partially achieved	Not achieved	Unable to assess / In progress	Total
1. Humane treatment of kangaroos	2	1			3
2. Promote community awareness and participation	6	2	3	1	12
3. Manage impacts of kangaroos on land condition	2	1	1		4
4. Monitor kangaroo populations and set quotas	17	1			18
5. Monitor industry compliance	8	3	1		12
6. Facilitate adaptive management and research	4	1	1	1	7
7. Undertake program reporting and review	2	1	1	1	5
Total	41	10	7	3	61

A brief summary is provided below of the strengths and weaknesses in progress for each of the plan's 7 aims. For detailed reporting, see Table 13 (in Appendix 2).

Aim 1. Ensure humane harvest of kangaroos

Of the 3 PIs under Aim 1, 2 were achieved and one was partially achieved.

The PIs around the Commercial Code were met, and relevant animal welfare research is underway interstate although DEW did not itself promote research.

Aim 2. Promote community awareness and participation

Of the 12 PIs under Aim 2, 6 were achieved, 2 were partially achieved, 3 were not achieved and one could not be assessed.

Provision of information during the period of the plan was good and DEW participated in media interviews and prepared media releases. There were 2 significant shortcomings under Aim 2: a communication strategy was not developed, and there was limited progress with engaging Aboriginal stakeholders in the implementation of the plan and in kangaroo management. Regarding Aboriginal stakeholder involvement, it should be noted that DEW succeeded in filling the designated position on the KMRG during the period.

Aim 3. Manage impacts of kangaroos on land condition

Of the 4 PIs under Aim 3, 2 were achieved, one was partially achieved and one was not achieved.

DEW made a good start in educating DEW regional staff and land managers on best practice for combining the use of commercial and non-commercial options for kangaroo management, although no progress was made on the proposed investigation of training tools to improve awareness of the Non-Commercial Code of Practice for people requesting a non-commercial Permit to Destroy Wildlife.

Aim 4. Monitor kangaroo populations and set quotas

Of the 18 PIs under Aim 4, 17 were achieved and one was partially achieved.

Performance under Aim 4 was excellent, with all processes around monitoring kangaroo populations and setting quotas followed; the only shortcoming was that Quota Reports were consistently provided late to the Commonwealth.

Aim 5. Monitor industry compliance

Of the 12 PIs under Aim 5, 8 were achieved, 3 were partially achieved and one was not achieved.

Performance under Aim 5 was very variable. Performance indicators relating to permits and permit conditions were largely met, steps were effectively taken to ensure that permit holders are competent to meet Commercial Code and other standards, and compliance actions were taken and records maintained. However, the PIs that were established for inspections of all field chiller premises and kangaroo processing works were only partially achieved; given how consistently these were not met, it is likely that the PIs were unrealistic.

Aim 6. Facilitate adaptive management and research

Of the 7 PIs under Aim 6, 4 were achieved, one was partially achieved, one was not achieved and one could not be assessed.

There was limited progress under Aim 6. The proposed investigation of ecologically sustainable kangaroo densities was not achieved, because the population model did not progress as anticipated. There were no adaptive management experiments or research into the biology and ecology of commercially harvested kangaroo species; 3 applicable PIs are assessed as achieved, although DEW did not undertake any actions towards them.

Aim 7. Undertake program reporting and review

Of the 5 PIs under Aim 7, 2 were achieved, one was partially achieved, one was not achieved and one was in progress.

Performance under Aim 7 has generally been good. Annual Harvest Reports are produced that meet the requirements of an annual report for the Commonwealth and are made available on the webpage; these were consistently provided slightly late to the Commonwealth. DEW prepared the internal review report in a timely manner to inform this independent review. The independent review commenced approximately 3 months after the stated date in the relevant PI.

5 Conclusions and recommendations

Progress

Overall there has been good progress towards the overall goal to ‘provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development’. The procedures and methodologies for monitoring kangaroo populations, setting sustainable annual quotas and dynamically reviewing these during the year are well established, rigorous and, for most species and CHSRs, based on long-term datasets and population analysis. For harvested species and CHSRs newly available under this plan, appropriate steps were taken to ensure that baseline understanding was established to ensure that the harvest would be sustainable.

This finding is supported by the results of the external survey, in which 60% of respondents agreed or strongly agreed that the plan had met its overall goal.

There was also good progress towards the goal to ‘provide an alternative management option for reducing the damage caused by overabundant kangaroos’, by expanding the harvest area, adding additional kangaroo species, and taking steps to actively promote commercial harvest as an alternative or complementary option for land managers. This progress represents a good start in this direction and the next plan should build on this start (see Recommendation 6).

Particular strengths in achievements against actions and PIs are in the areas of ensuring compliance with the Commercial Code, provision of information, progress on educating DEW regional staff and landholders about using commercial harvest as a land management option, and monitoring kangaroo populations and setting quotas. Weaknesses in achievement are in the lack of a communication strategy, limited engagement with Aboriginal stakeholders (although there has been an Aboriginal representative as a member of KMRG during the plan period), and only partial achievement of the established PIs for compliance inspections of field chillers and kangaroo processing works.

Recommendations

Based on the findings from the internal review, external survey and independent review, the following recommendations are proposed for the next plan. They are grouped under PIs, goals, and the 7 aims of the plan.

Performance indicators

1. Ensure that all performance indicators are worded to reflect the expected results from actions that are taken, rather than as actions.

Rationale: Many of the PIs in the plan are worded as actions (e.g. ‘DEW will instigate compliance action on all South Australian permit holders ...’) rather than worded to reflect the expected result that will be achieved from an action (e.g. ‘Compliance action instigated for all identified breaches of permit conditions ...’). Also, some of the actions that are listed in the set of PIs may not require PIs to be set for them (see Recommendation 3).

2. Consider including some PIs that assess outcomes and desired change, in addition to the many output-based PIs in the current plan.

Rationale: Most of the PIs in the plan are focused on outputs and whether DEW completed an action, not on outcomes and any desired change that was achieved. This is appropriate for many actions, especially those relating to meeting regulatory requirements, and has the advantage that such PIs are easily assessed and do not require an additional monitoring and evaluation commitment. However, such PIs provide limited information on whether the plan is actually

achieving change. It would be beneficial if some PIs were included that assessed whether change was being achieved; for example, under Action 8 under education of DEW regional staff, measures could be put in place to assess 1. the extent to which DEW staff encouraged landholders and/or 2. whether this has resulted in changes in practices by landholders. **Care should be taken when committing to such PIs, because they may require collecting additional monitoring data.**

3. Consider having fewer PIs than are in the current plan, while ensuring that core regulatory requirements and key strategic directions are covered.

Rationale: The current plan has 61 PIs, which creates a substantial reporting burden. It is important that DEW does not feel that everything must be measured under such a plan. Clearly, it is necessary that core regulatory requirements and strategic directions are included. Opportunities to rationalise the number of PIs may arise from the process of removing actions from the set of PIs (as per Recommendation 1).

4. Do not include the 'one-month response time' that is in some PIs in the current plan, unless tracking is put in place to enable reporting against it.

Rationale: Three of the PIs commit DEW to a one-month time frame to complete different tasks; however, there is no tracking undertaken of the time taken to complete, therefore reporting against those PIs is incomplete.

Goals

5. Either set a single goal that is referred to consistently throughout the document or set a 'Primary' and a 'Secondary' goal and structure the plan to clearly respond to them.

Rationale: There is some inconsistency in the stated goal for the plan. In the 'Introduction', the primary goal is stated as 'to ensure an ecologically sustainable harvest of kangaroos and to provide an alternative management option for reducing the damage caused by overabundant kangaroos' (p. 2), whereas in the 'Goal and Aims' section, the goal is stated as 'to provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development' (p. 5).

6. Retain the high-level commitment to providing alternative management options for reducing the damage caused by overabundant kangaroos in the new plan, either as a goal or as a standalone aim.

Rationale: The first goal listed under the rationale for Recommendation 5 – providing an alternative management option for reducing the damage caused by overabundant kangaroos – is more progressive and sets a more ambitious land management agenda than the second, which is largely about meeting regulatory requirements. The findings from this review show that a good start has been made in pursuing this agenda and it should be maintained.

The following recommendations refer to the content of actions and PIs in the current plan under each aim, using the existing numbering; clearly this numbering will change in the new plan.

Aim 1. Ensure humane harvest of kangaroos

7. Action 1 and PI 1.1: Ensure that the relevant PI is unambiguous and directly responds to the action.
8. Action 2 and PI 2.2: Consider rewording from 'promote' to 'maintain a watching brief and, if a gap is identified, look for opportunities' (or similar).

Aim 2. Promote community awareness and participation

9. PI 4.1: Refresh the information on the webpage to fill the gaps identified under the relevant comments in Appendix 2 of this report, or change the information list in the PI to match that which is currently on the webpage.

10. PI 4.2: Remove.
11. PI 4.3: Consider removing, because the one-month time frame is not tracked, the PI does not respond to Action 4, and there is ambiguity around 'publicly available' and 'interested parties'.
12. PI 5.2: Consider either removing the examples under 'such as' or list the population surveys as the only example.
13. Action 6 and PI 6.1: Include an action to develop an engagement strategy that establishes the aim(s) of engagement; identifies sectors / stakeholder groups that have an interest; analyses stakeholders' aspirations, needs and challenges; and determines suitable communication and information management measures. Note that this should be a dedicated action not only a PI. The engagement of First Nations peoples, which has made limited progress and appears to lack a purpose and direction, should be specifically included as part of this engagement strategy as an opportunity to develop a shared purpose and direct future communications and involvement.
14. PI 7.2: Consider removing and incorporating into the engagement strategy action, or changing to specifically refer to KMRG.
15. PI 7.3: Remove and incorporate into the engagement strategy action.

Aim 3. Manage impacts of kangaroos on land condition

16. PI 8.1: Reword to be less prescriptive about what will be produced.
17. PI 8.3: Consider removing.
18. PI 8.4: Consider rewording to be more specific about what is intended and consider separating out on-park and off-park kangaroo management.

Rationale: This PI addresses an important strategic direction but it is worded as an action and is somewhat vague.

Aim 4. Monitor kangaroo populations and set quotas

19. PI 9.1: Update to reflect the current status of the model.
20. PI 9.2: Remove or reword to match any proposed changes in the new plan (e.g. expanded areas rather than new areas?).

Rationale: This action specifically referred to new CHSRs under the current plan.
21. Action 10: Reword to place more emphasis on the systematic risk assessment that is conducted every year to determine which CHSRs were to be surveyed and why.

Rationale: The risk-based assessment is a robust and systematic process that is undertaken each year.
22. PIs 11.2 and 11.3: Either remove these or reword, because they are currently detailed operational quota-setting protocols, not PIs.
23. PI 11.3: Reword this quota-setting PI to remove or clarify the link with the risk assessment under Action 10, which is about surveys.
24. PI 11.4: Keep this commitment to review the HAQ method at the end of the next plan.
25. Action 12: Move this to follow Action 10 so that these survey-related actions are grouped and the quota-related actions follow them.
26. PI 12.1: Consider removing as this appears to be a part of the risk assessment process under Action 10.

- 27. PI 12.3: Remove or reword to match any proposed changes in the new plan (e.g. expanded areas rather than new areas?) and to provide information on surveying the new CHSRs from this plan, if necessary.
- 28. Action 16 and PI 16.1: Consider removing or rewording to make the purpose clearer.
- 29. PI 16.2: Consider keeping this for transparency but moving to Action 28, because the PDW data are reported in the Harvest Report.

Aim 5. Monitor industry compliance

- 30. Action 17: Reword to 'All permits are issued in accordance with South Australian legislation and DEW policy' (or similar), because the word 'permitted' is ambiguous in the current action.
- 31. PI 17.1: Remove or replace with updated language that reflects the permit system now in place.
- 32. PI 18.2: Remove unless the one-month time frame will be tracked.
- 33. PI 20.1: Remove Biosecurity SA from this PI unless relevant data will be collected to enable full reporting; confirm legislative / regulatory requirements and ensure that PI meets these and that PI is realistic; consider committing to inspecting a proportion of chillers every year if possible; if the commitment remains to inspect all chillers then clarify intent by changing to '... will inspect all field premises at least annually ...'.
- 34. PI 20.2: Remove Biosecurity SA from this PI unless relevant data will be collected to enable full reporting; confirm legislative / regulatory requirements and ensure that PI meets these and that PI is realistic; consider committing to inspecting a proportion of kangaroo processing works every year if possible.
- 35. PI 20.3: Remove unless there is new interest in a MOU.
- 36. PI 21.2: Keep to ensure that training is kept up to date?

Aim 6. Facilitate adaptive management and research

- 37. Action 25 and PI 25.1: Update to include the current direction of such research and investigations and to reflect the current status of the model.
- 38. PI 25.2: Consider removing.
- 39. Action 26 and PIs: Consider removing the PIs or specifying a target number of adaptive management experiments to be implemented.

Rationale: The PIs as written become meaningless when there are no adaptive management experiments performed; these PIs were difficult to assess.

Aim 7. Undertake program reporting and review

- 40. PI 29.3: Consider keeping the submission due date but not having it in a PI because it will always be difficult to assess in any reporting.

Appendix 1: Summary of written responses to external survey questions

Table 12: Summary of the written responses to Questions 6, 14, 16, 18, 20, 21 and 22 of the external survey.

Question 6: Reasons for responses to Question 5 regarding whether the plan met its goal to 'provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development'.

- The species are well protected and impacts on kangaroo numbers are sustainable – kangaroo numbers are still high ('as high as we've seen in our area') – quotas are conservative and therefore easily sustainable – although the plan does not lead to a significant ecological impact; Harvest Reports only report on take not ecological results
 - The industry seems to be managed well with kangaroo surveys, quotas and accountability
 - Commercial take is mostly males which means little impact on breeding potential of populations
 - With low professional shooter numbers and low percentage takes of quotas, there is room to take many more
 - The plan clearly sets requirements and reporting structure to ensure a humane and sustainable commercial industry – plan provides a means where kangaroos can be harvested sustainably informed by science and evidence
 - The plan is more an industry document than a sustainable tool to limit kangaroo numbers below environmental thresholds; goal could be revised to 'provide for sustainable management of kangaroo species...'
 - Question around relevance of plan given 'uncontrolled continuous kangaroo shooting outside of harvest'; also nothing in the plan about recreational shooters shooting kangaroos 'for fun'
 - A lot of kangaroos are going to waste on destruction permits and illegal shooting
 - Kangaroos to some sectors are now treated as a pest
 - Commercial harvesting has been successful where applied
 - Improvements to the plan are needed because in some CHSRs harvesting was stopped when kangaroos were abundant and destruction under PDWs was occurring
 - It is sustainable for kangaroo populations, but what about sustainability of populations of other species that are impacted by kangaroo grazing pressure?
 - Comments on differences around permit process for kangaroo field processors and PDWs
-

Question 14: Reasons for responses to Question 13 regarding whether the identified management practice was effective at mitigating the risk of overharvesting of kangaroos.

- Data are used to determine sustainable harvest – decisions are based on evidence
- Low percentage take of quotas ensures populations can thrive – quotas are already conservative, so tying with monitoring ensures there is no overharvesting – no risk/very low risk in most parts of the state that quotas will be exceeded
- Strongly agree when referring to the commercial sector but concerns around non-commercial take, including illegal activities, that occur when commercial zones are closed; 2 issues arise: 1. potential overharvesting and 2. animal welfare impacts
- Kangaroos are typically overabundant in most regions and in no real risk of being overharvested; commercial harvesting unlikely to be profitable with low kangaroo densities so should be largely self-regulating
- Kangaroo densities vary dramatically in different areas, including nearby areas; need more flexibility for landowners to manage their own land
- Have seen no proof either way
- Questioned legitimacy of quota setting because kangaroos move around and there is a time delay from population counts to quota setting; quota in areas where kangaroos did not previously occur should be closer to 100% of the population
- Eyre Peninsula – still have medium to very high populations across the region
- Questions raised about DEW processes: management plan ensures sustainable use of kangaroos but does not control every aspect of kangaroo management (i.e. commercial and non-commercial) – 'the left hand is not talking to the right hand'; also related comments on 'ethical and moral issues where commercial harvesters

could not purchase tags but could shoot and leave on the ground', identified as 'a clear flaw in kangaroo management that has affected many field processors' for years

- Support expressed for the mechanism in principle but not sure about new areas under commercial harvest due to lack of information on the population monitoring methods

Question 16: Reasons for responses to Question 15 regarding whether the identified management practice was effective at mitigating the risk of inhumane destruction of kangaroos.

- Many comments about differences between professional shooters vs amateur shooters, especially different regulations / requirements and different attitudes – 'any kangaroo deserves the right to be taken by an accredited shooter'
- Confident about commercial harvest and accreditation – concerned about non-commercial destruction of kangaroos - there is no in-field monitoring of compliance; requirements less stringent around training, accuracy, and reporting numbers and species shot; no tagging
- High standard required to pass test – ensures that shooters have the skill and expertise to humanely destroy animals – also shooters in general take their job seriously and are compliant
- There are enough checks and balances – compliance activities contribute to a very high standard shown by the industry – carcass inspection at meat works is important
- Issues with checking chillers – difficult to get into when near full; little oversight of shooters in the field and a lot of trust placed in shooters only being paid for carcasses that processors are prepared to take
- Routine checks are 'somewhat over the top and costly'
- Concerns that field operations not being observed means that non-head-shot animals can be left in-situ; joey welfare is not assessed in chiller inspections
- Very few staff to manage the system
- Some specific questions and suggestions regarding the Commercial Code and the NPW Act regulations

Question 18: Reasons for responses to Question 17 regarding whether DEW adequately investigates reports of non-compliant activities relating to kangaroo management.

- Adequate, but with increasing opposition to the trade it could be increased
- Unless proof is provided DEW 'puts it in the too hard basket'
- Various comments that reports of non-compliance 'seem to be followed up vigorously' – respondents commented on investigations they have done that have resulted in court cases and consequences and investigations that they had heard of
- Various concerns around timeliness and thoroughness of investigations and the lack of communication back to complainants
- The focus is on accredited harvesters not non-harvesters
- Some respondents said they would have answered 'unsure' if had the option
- Professional shooters hear many reports of inhumane destruction by non-professional shooters – DEW should investigate these
- Suggestions that DEW is under-resourced for monitoring and prosecuting non-compliant activities

Question 20: Reasons for responses to Question 19 regarding whether the commercial kangaroo industry is effective at reducing kangaroo numbers as part of managing total grazing pressure on properties.

- Some positive comments on effectiveness – effective at Chowilla and Pike, keeps the numbers down to a reasonable level and there has been a good post-flood vegetation response
- Several comments on lack of effectiveness
 - o It is dependent on whether the price is good and the kangaroos can be sold – the past 6 years it has not happened
 - o So few are taken commercially that it has little effect on total grazing pressure
 - o Numbers of kangaroos keep going up – owners need to have more power to reduce numbers on their land and are best to consult on these matters
 - o In periods of high abundance there are not enough numbers taken to have an effect
 - o Better than nothing but not effective – costs are too high and returns too low – lack of processor factory demand is a problem – harvesting efforts do not compare with natural migration and deaths during drought
 - o 'Potentially effective' but most harvesters are part-time and have little to no impact on numbers and much more needs to be done to manage grazing pressure effectively – unlikely to be able to see individual impact for farmers on a property-by-property basis

- Not effective at landscape scale – still have higher than sustainable numbers across Eyre Peninsula, having a negative effect on vegetation communities and wildlife – projects for recovery of vegetation communities require removal of more kangaroos than current commercial kangaroo industry is capable of
- ‘We are on balance, left with an over-abundance issue’
- Positive comments on a specific Kangaroo Project Partnership that issued free tags to harvesters
- Mobile chillers enable quick deployment into areas with high kangaroos numbers which helps to manage the pressure
- Challenges with economic viability of harvest in remote parts of the state and in areas where vegetation is more dense
- Several comments that there are not enough commercial harvesters in SA
- More processors needed – SA currently has only one processor capable of taking enough kangaroos to make a difference but they import many of their carcasses from NSW and QLD
- Targeting males does little to manage the breeding potential of a population and produces inferior meat

Question 21: Identified knowledge gaps in kangaroo management that require more research.

- Travelling and movement patterns of kangaroo species
- The need for different grazing management in different areas of CHSRs according to need
- Raise profile of the qualities of meat and leather products and kangaroo as a sustainable protein source
- Raise profile of the effects of overabundant kangaroos and the benefits of eating rather than wasting kangaroo meat
- External review of the methods used to determine population densities and quotas (referred to an external review by NSW Department of Environment and Heritage)
- Impact of the River Murray flood on kangaroo population across the floodplain and implications for future management
- Improve knowledge of the number of kangaroos killed through destruction permits and illegal shooting
- Water management across pastoral zones
- Biological controls
- Protection of sheep flocks from predation by dingoes
- Consider 100% quota in areas where species were previously absent
- Consider movements and population changes between when survey done and quotas set
- Quantify damage from overabundant kangaroos on native vegetation health and other wildlife – quantify production loss in monetary terms
- Euro quotas – suggestion that this was incorrect in some areas
- Various specific comments on SAPFPO involvement, licensing and tags
- Social licence – educating people about the need for kangaroo control
- Training courses for farmers and sporting shooters
- More acknowledgment and attention to recreational shooters shooting kangaroos ‘for fun’ – more public awareness raising around the need for a permit to destroy kangaroos

Question 22: Further comments.

- Kangaroos are not one species, no other meat is marketed like this
 - Roo numbers work on a boom/bust cycle, seasonally dependent; management needs to consider this
 - Request from meat processor for more transparency and timeliness from DEW in sharing any observations that affect harvesters, field chillers or any other matters that are relevant
 - It takes a lot of work to justify the need to cull kangaroos on parks and get approval, then the resources it takes to reduce the numbers of kangaroos with on-ground shooting programs to a level that makes a difference is challenging
 - Comment from field harvester who sometimes operates close to towns regarding a contradiction around not being allowed to use a sound moderator for commercial harvesting but being allowed to for non-commercial
 - Landowners should have no restrictions on culling numbers
 - Some specific questions and comments about permits and forms
 - Suggestions around having more environmentally friendly approaches than plastic tags and paper-based system for tag orders
 - 6-month landholder consent is too short – should be yearly
 - Various specific comments from SAPFPO
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- Nature Maps not user-friendly – would be good to make it easier for land managers to find the commercial harvest boundaries
 - Where we are protecting native species as a result of reducing kangaroo populations, there needs to be a pragmatic and realistic method for estimating population sizes and determining impacts on land condition and other native species; monitoring should be proportionate to the issue
 - Comments regarding training of non-commercial shooters
 - The industry is in poor shape so many pastoralists are looking to sporting/recreational shooters for mass culling
 - An inquiry to identify solutions to the problems faced by the industry
 - Cutting red tape around being able to process for pet food only
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Appendix 2: Detailed traffic light analysis of achievement of performance indicators

Table 13: Detailed ‘traffic light’ analysis of progress against achievement of performance indicators in the plan; in the Achievement column, the independent assessment is provided for each indicator as ‘Achieved’, ‘Partially achieved’, ‘Not achieved’ or ‘Unable to assess / In progress’

Action	Performance indicator	Achievement	Comments / verification
Aim 1. Humane treatment of kangaroos			
1. DEW staff will monitor compliance with the Commercial Code by commercial kangaroo industry operators.	1.1 DEW will instigate compliance action on all South Australian permit holders who are found to have breached permit conditions (i.e. the Commercial Code) relating to animal welfare	Achieved	Investigations and compliance actions taken during each year are routinely documented in the ‘Compliance’ section of annual Harvest Report; few of these relate to non-compliance with the Commercial Code, because few breaches are identified. Verified by: Harvest Reports and discussion. Note that the PI is slightly ambiguous but the action is clearly intended to be about compliance with the Commercial Code.
2. DEW will promote research opportunities into improving animal welfare outcomes.	2.1 DEW will participate in a national review of the Commercial Code of Practice during the life of this plan.	Achieved	Review completed and DEW participated. Verified by: National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (November 2020) and discussion.
	2.2 DEW will promote research into improving animal welfare outcomes for commercial harvest of kangaroos.	Partially achieved	DEW did not actively promote or collaborate in relevant research into animal welfare outcomes. Nevertheless, research was undertaken interstate into the evaluation of a captive bolt device for euthanising the dependent young of shot females, which is the key animal welfare issue identified by DEW for the commercial harvest of kangaroos. DEW staff remained informed of the research through their network of national contacts. Verified by: discussions, online research reports.
Aim 2. Promote community awareness and participation			
3. Members of the Kangaroo Management Reference Group will be provided with information and afforded the opportunity to advise DEW on kangaroo management issues throughout the life of this plan.	3.1 DEW will provide KMRG members with information as required throughout the life of this plan	Achieved	KMRG members were provided with information such as draft quota and Harvest Reports, meeting agendas and meeting minutes, and other relevant letters/ documents. Information relating to issuing of destruction permits and compliance also provided as requested. Verified by: internal review report and KMRG agendas and minutes.
	3.2 DEW staff will organise KMRG meetings at least twice per year for members to provide advice to DEW on the management of kangaroos in South	Achieved	Meetings occurred twice per year with the exception of one meeting cancelled in 2020 due to restrictions during the COVID-19 epidemic. Since then MS Teams has been used to enable members to attend online if required. Verified by: KMRG agendas and minutes.

	Australia and the implementation of this plan.		
4. Public documents will be made available on the Kangaroo Conservation and Management webpage.	4.1 DEW staff will update the Kangaroo Conservation and Management webpage as required to ensure that the webpage contains the following information: • statement of reasons commercial harvest is undertaken in this state • current and previous kangaroo management plans • current and previous 3 annual Quota Report • current and previous 3 annual Harvest Report • historical and current population estimates and harvest data • contact information for the Kangaroo Management Program • current forms for commercial kangaroo permits and permit holders	Achieved	Most of the listed information is on the webpage, with some minor gaps: • a generic statement of reasons for managing kangaroo populations is provided but it is not specific to commercial harvest • current and previous kangaroo management plans – only current plan available • current and previous 3 annual Quota Report – yes, since 2019 • current and previous 3 annual Harvest Report – yes, since 2019 • historical and current population estimates and harvest data – yes, in Harvest Reports (although this is not clear in text on webpage) • contact information for the Kangaroo Management Program – yes, via Port Augusta DEW Regional Office • current forms – yes Verified by: webpage.
	4.2 DEW staff will ensure that documents outlined in 4.1 and any additional information, is published on the DEW web site within one month of becoming publicly available.	Unable to assess / In progress	This PI specifically relates to documents being published to the webpage <u>within one month</u> of becoming available; it could not be assessed because records were not kept of the timing of documents being published on the webpage and it was not practical for this review to interrogate historical DEW website management records. DEW staff indicated that they publish documents as soon as possible after they become available. This 'within one month' PI should be reconsidered in the next plan.
	4.3 DEW staff will distribute publicly available kangaroo management information to interested parties within one month after such a request.	Partially achieved	This PI specifically relates to information being distributed <u>within one month</u> after a request from interested parties; it could not be fully assessed because records were not kept of the timing of information being provided. Despite the timing not being tracked, this PI is assessed as partially achieved because DEW distributed a lot of information during the plan period. DEW staff indicated that: - Harvest Reports and Quota Reports are sent to permit holders once documents have been approved - harvest data is extracted for individual properties at the request of owners / land managers;

			this can take a lot of time - landholder and Kangaroo Field Processor factsheets have been distributed - they refer interested parties to the webpage where possible, especially for the general public. Verified by: internal review report and discussions. This 'within one month' PI should be reconsidered in the next plan.
5. Where appropriate, DEW staff will participate in media interviews and prepare media releases.	5.1 DEW staff will participate in interviews on request from media agencies where appropriate.	Achieved	Various staff members participated in interviews in response to media requests, especially at the time of the annual aerial survey (see reporting under PI 5.2). No records were available of these appearances, except for an appearance by the Senior Kangaroo Ecologist on ABC TV Landline as part of a report on the commercial kangaroo industry, which is available on YouTube. Verified by: discussion and video.
	5.2 DEW will prepare media releases when appropriate for issues of interest to the community, such as population surveys (June) and the release of the quota for the next calendar year, once approved by the State Minister (November).	Achieved	Media releases were issued every year at the time of aerial kangaroo surveys; 2 media releases from 2023 were provided as examples. Media releases were not issued at the time of the release of Quota Reports. The PI is not prescriptive about the subject of media releases, therefore the PI is considered achieved. Verified by: 2023 media releases and discussion.
6. Information about the Kangaroo Management Program and other information will be developed as required and distributed to stakeholders.	6.1 DEW staff will develop a communication strategy for the Kangaroo Management Program, including both internal and external stakeholders. The communication strategy will include the newsletter that is currently provided to stakeholders.	Not achieved	A communication strategy was not developed and the newsletter has not been issued since September 2019. The newsletter has been replaced by a permit bulletin from February 2024 (see below). DEW staff pointed out that a more proactive approach has been taken to communications, despite a strategy not being developed, including: - quarterly harvest updates - quota and Harvest Reports are sent to stakeholders - more engagement with DEW regional offices and landscape boards. The newsletter has been replaced by a bulletin called Roo News that is sent to all permit holders; this is smaller and more targeted as a permit bulletin than the newsletter. This will be released twice per year. The first Roo News was issued in February 2024, which means that there was a gap from Sep 2019 to Feb 2024 with neither a newsletter nor bulletin. The Roo News bulletin was provided.
	6.2 DEW staff will issue an information package with every new Kangaroo Field Processor permit throughout the life of this plan to ensure permit holders are	Achieved	Comprehensive information packages containing key documents for permit holders to be aware of were distributed. Verified by: information package.

	aware of permit requirements and responsibilities		
7. Involve Aboriginal stakeholders in the implementation of this plan.	7.1 DEW staff will hold specific discussions with representatives of Aboriginal communities to develop more effective ways of sharing information.	Not achieved	Not progressed. It was apparent from discussions with DEW staff that there is no clear purpose to this action and PI – i.e. the intended outcome of involving Aboriginal stakeholders and sharing information was not clear – which is part of the reason the action has not been progressed. It was also apparent that there is little regular communication between the DEW program and Aboriginal stakeholders (noting the reporting on KMRG under PI 7.2).
	7.2 DEW will encourage Aboriginal participation in kangaroo management.	Partially achieved	Under the terms of reference (TOR) for the KMRG, one member 'shall represent Aboriginal interests in kangaroo management'. Accordingly, there was a member representing Aboriginal interests for most of the period of the plan, although DEW reported that attendance at meetings was low. DEW reported that they made concerted efforts to encourage more active participation in the KMRG, including through the Ikara-Flinders Ranges National Park Co-management Board. Beyond KMRG membership and attendance, there were limited active steps to encourage Aboriginal participation in kangaroo management Verified by: KMRG TOR and membership, discussions.
	7.3 DEW staff will involve Aboriginal people in the development of the communication strategy for the Kangaroo Management Program (Action 6).	Not achieved	Not progressed as the communication strategy was not progressed; see reporting under PI 6.1.
Aim 3. Manage impacts of kangaroos on land condition			
8. Educate DEW regional staff and land managers on best practice for combining the use of commercial and non-commercial options for kangaroo management.	8.1 DEW staff will develop decision-making tools, including a pros and cons list of harvesting, to assist regional DEW staff in providing advice to land managers on commercial vs. non-commercial kangaroo management.	Achieved	'Commercial kangaroo harvest information package' developed and sent to regional DEW staff within commercial harvest zone once the current plan was approved, to empower them to have informed conversations with landholders about commercial harvest as an alternative / additional option from non-commercial destruction (i.e. Permits to Destroy Wildlife). The package does not explicitly include a 'pros and cons' list as per the PI, but the detailed package is considered to meet the intent of the action and PI. Verified by: Information Package and discussion.
	8.2 DEW staff will encourage landholders applying for a Permit to Destroy Wildlife (Kangaroos) within the commercial harvest area to use	Achieved	During discussions, DEW Kangaroo Management Program staff were confident that regional staff were encouraging landholders to consider using a kangaroo field processor when applying for a non-commercial permit to destroy kangaroos within the commercial harvest area, as a result of the information package provided; there is no tracking of whether this is occurring.

	kangaroo field processors where possible.		Also, information about commercial harvesting has been added to general training for DEW staff on issuing Permits to Destroy Wildlife. Verified by: discussion.
	8.3 DEW staff will investigate the introduction of training tools (like those undertaken by people applying to become kangaroo field processors) to improve awareness of the Non-Commercial Code of Practice for people requesting a non-commercial Permit to Destroy Wildlife (Kangaroos).	Not achieved	Not progressed.
	8.4 Investigate alternative ways to integrate commercial and non-commercial kangaroo management options to mitigate damage to land condition.	Partially achieved	Progress has been made on integrating commercial and non-commercial options on NPW Act reserves; through strongly encouraging the use of commercial shooters on park, DEW reported: i. an increase in the number of harvested animals on park, and ii. an increase in the number of parks using commercial harvesting (data provided). No relevant progress was reported off park, although during discussions DEW staff identified various areas of interest in integrating commercial and non-commercial harvest to achieve multiple benefits, including mitigation damage to land condition and improved confidence in animal welfare. Verified by: statistics on trends in commercial harvest on reserves.
Aim 4. Monitor kangaroo populations and set quotas			
9. Population estimates will be obtained using a combination of standard survey method and population model.	9.1 Population models developed by the University of Adelaide and run by DEW staff will be used to predict annual population estimates for species in CHSRs with long-term datasets. Established CHSRs are surveyed by DEW once every three years, except for three sub-regions that will be surveyed annually.	Achieved	Population models were developed by the University of Adelaide and have been used since 2021 by DEW staff to predict annual estimates for western grey and red kangaroo populations in the northern areas of SA. In CHSRs that have been surveyed in a particular year the model estimate is compared to the survey estimate and, if management decisions differ based on the estimate, the most conservative is applied. The PI is therefore achieved. Notwithstanding the PI being achieved, there have been shortcomings with the applicability of the model. With regard to the expected result that survey effort will be reduced, this has not been achieved and some areas (e.g. Yorke Mid-North) have been surveyed more often over the period, because the model outputs were unreliable. Verified by report: 'Spatial population models for red and western grey kangaroos in the South Australian rangelands', report to the Department for Environment and Water, T.A.A. Prowse, University of Adelaide, Adelaide, August 2021; also DEW internal review report and various discussions with DEW staff regarding the model.
	9.2 Surveys are conducted by DEW in new CHSRs to establish a population	Achieved	There were 4 new CHSRs under the plan, all of which opened 1 Jan 2020: these were surveyed in 2019; this was documented in the 2020 Quota Report (i.e. the report published in

	estimate for each species before they are opened for commercial harvesting.		late 2019). Also, additional surveys were conducted on Kangaroo Island after severe bushfires in 2019–20 and this CHSR was closed for 12 months. Verified by: 2020 Quota Report, internal review report and discussions.
10. A risk-based approach is used for determining which Commercial Harvest Sub-Regions are surveyed each year.	10.1 DEW staff will survey additional CHSRs if the DEW Kangaroo Management Program are concerned that kangaroo populations are approaching management thresholds.	Achieved	A risk-based approach was used every year to determine which CHSRs were to be surveyed and why; this involved an MS Excel spreadsheet with a automatic assessment of relevant factors (including population thresholds and harvest rates) and manual assessment. The risk assessments for each year of the plan were provided (2020, 2021, 2022, 2023 and 2024); also, the Quota Reports show which CHSRs were surveyed each year, although they do not include information on the reason. Verified by: Annual risk assessments and Quota Reports.
11. Sustainable commercial kangaroo harvest quotas will be set annually per Commercial Harvest Sub-Region for each species.	11.1 DEW sets species-specific proportional quota for each species within each CHSR based on the most recent population estimate.	Achieved	Species-specific proportional quotas were set for each CHSR as per the plan: 20% for reds, 15% for greys, 15% for euros, and 10% for tamar wallaby, from either model or survey estimate of population. These are documented annually in the Quota Reports. Verified by: Quota Reports and discussions.
	11.2 Director of National Parks and Wildlife may issue High Abundance Quota (HAQ) for species when the current population estimate for that species in a CHSR is above the threshold (average population estimate).	Achieved	No High Abundance Quota has been issued during the life of the plan. Verified by: Internal review report, Quota Reports.
	11.3 DEW will reduce quotas in between survey years if the Kangaroo Management Program are concerned that kangaroo populations are approaching management thresholds if trajectory continues based on risk assessment detailed in Action 10.	Achieved	The annual Quota Report describes the justification for setting species-specific quotas in each CHSR, especially considering population estimates, thresholds and trends. Quotas are often reduced in between survey years in response to this. For example, in 2020 the estimated western grey kangaroo population had shown substantial and continuing declines and had reached low population thresholds in some CHSRs; accordingly, quotas in 2021 were reduced from 15% to 10% in North Flinders and Eyre West and was suspended in North East Pastoral, and the population was surveyed in 2021. This is described in the 2021 Quota Report. Verified by: Quota Reports, discussions.
	11.4 DEW will review the HAQ method at the end of the life of this management plan	Achieved	HAQ has not been issued during the life of the plan, therefore there are no examples to use to conduct a review. DEW, in consultation with KMRG, considers that it is still beneficial to keep HAQ in the next plan. Verified by: discussion.
12. Surveys will be reduced or stopped in CHSRs with a consistently low harvest and will start again once the	12.1 DEW staff will monitor harvest data through permit returns in all CHSRs and survey frequency will be varied as required.	Achieved	DEW staff regularly monitor harvest returns by running reports approximately weekly to check compliance, look for outliers/non-matching data, track sex bias and weights, and ensure that tag sales do not exceed the quota. In addition, specific data will be extracted sometimes to inform consideration of other matters relating to the kangaroo management program.

harvest has reached the low harvest threshold.			See reporting under performance indicator 10.1 for the description of the risk-based approach to determining which CHSRs will be surveyed. This can include consideration of harvest returns. Verified by: discussion, annual risk assessments.
	12.2 In established CHSRs, if the harvest declines below the low harvest threshold (1.5% of the population average) DEW will stop surveys until the harvest reaches the threshold.	Achieved	See reporting under performance indicators 10.1 and 12.1; harvest rate (reported in annual Harvest Reports) is considered in determining surveys. Verified by: discussion, annual risk assessments, Harvest Reports.
	12.3 After DEW conducts the initial survey to allow harvesting in new CHSRs, additional surveys will be conducted at five-yearly intervals until harvest exceeds 1.5% of the most recent population estimate, at which point surveys will be conducted at three-yearly intervals. If the harvest then declines below the low harvest threshold, a five-yearly survey interval will be resumed.	Achieved	New CHSRs have been surveyed regularly throughout this plan: Lower South East and Hills and Fleurieu have been surveyed annually, Kangaroo Islands surveyed 2020 and 2021, and Upper South East surveyed 2020, 2021, 2023. See reporting under performance indicator 10.1 for the description of the risk-based approach to determining which CHSRs will be surveyed. Quota reports document which CHSRs were documented each year. Verified by: discussions, internal review report, annual risk assessments, Quota Reports.
13. When kangaroo populations decline to specific thresholds (low abundance thresholds), the commercial harvest of these particular species in the particular Commercial Harvest Sub-Regions will be reduced or suspended.	13.1 DEW will reduce commercial harvest quotas if population density estimates fall below 1.5 standard deviations of the average density (Threshold 1), or suspended harvest if population estimates fall below 2 standard deviations of the average density (Threshold 2).	Achieved	Quotas were routinely reduced in response to population estimates falling below Thresholds 1 and 2. These are documented in Quota Reports. For example, see reporting under PI 11.3 for western grey kangaroo quota reductions. Verified by: Quota Reports, discussions.
14. Special Land Management Quota will be set annually.	14.1 DEW will issue Special Land Management Quota as needed. Any issue of Special Land Management Quota and the reasons for its issue are recorded and reported through an annual Harvest Report.	Achieved	Special Land Management Quota (SLMQ) was set annually and documented in Quota Reports; the actual SLMQ issued each year was reported in Harvest Reports, including the reasons for its use. Note that the SLMQ for a species is set at 1.5% of the total population across the commercial harvest area, and is then released on a sub-regional basis. Verified by: discussions, Harvest Reports, Quota Reports.
15. Population estimates and quotas will be reported annually in Quota Report	15.1 DEW will set all commercial kangaroo harvest quotas in accordance with the South Australian Commercial	Achieved	Quotas were set in accordance with the plan and documented in Quota Reports. Verified by: Quota Reports.

	Kangaroo Management Plan 2020–2024 throughout the life of the plan.		
	15.2 DEW will develop a Quota Report each year to report population estimates and harvest quotas for the following calendar year.	Achieved	Quota Report developed each year reporting population estimates and harvest quotas for the following calendar year. Verified by: Quota Reports.
	15.3 DEW will advise the Commonwealth Government of commercial harvest quotas through the Quota Report for the following calendar year by 30 November.	Partially achieved	Some Quota Reports were delayed during the life of this plan but have been delivered to the Commonwealth Government before 31 December each year. Verified by: e-mails from DEW to the Commonwealth Government providing the annual Quota Report.
	15.4 If Commonwealth approval is required for quotas set above the rates specified in the plan as part of an adaptive management experiment, DEW will obtain such approval before the additional quota is implemented.	Achieved	No quotas were set above what is specified in the plan, so no Commonwealth approval required. Verified by: internal review report.
16. Kangaroo populations will be monitored indirectly throughout the life of this plan.	16.1 DEW will monitor permit holder returns at the point of data entry for sudden, sustained, or acute changes in the information provided and will investigate changes to determine, where practicable, the cause of the change.	Achieved	Kangaroo sex bias and weights were monitored via returns, but no sudden change occurred to warrant investigation during the life of the plan; see reporting under PI 12.1. Verified by: discussion, internal review report.
	16.2 DEW staff will collate data from Permit to Destroy Wildlife for kangaroos, to support data gathered from industry returns.	Achieved	PDW data was collected each year and is reported in Harvest Report. Verified by: Harvest Reports.
Aim 5. Monitor industry compliance			
17. All activities are permitted in accordance with South Australian legislation and DEW policy.	17.1 DEW will assess a sample of commercial kangaroo permits across South Australia twice per year to determine that they are processed and issued by South Australian legislation and DEW policy.	Partially achieved	There is no systematic process in place for assessing a sample of permits twice per year as described in the PI. The intent of the PI – to ensure that permits are processed and issued in accordance with South Australian legislation and DEW policy – is met by the new permit system that has been in place since 2020, under which applicants apply online and must upload all required information and documents; DEW staff check each application before permits are issued. This PI is not needed in the next plan.

			Verified by: discussion, internal review report.
18. DEW will ensure that permit conditions are adequate and reflect current South Australian legislation, DEW policy and this plan.	18.1 DEW will review permit conditions annually before permits are renewed and, where necessary, amended before a new/ renewed permit is issued.	Achieved	Permit conditions and text in online permit system is checked for accuracy/ need to change each year prior to permit renewals in June/July. Delegated staff can set and change conditions as required. For example, when the new Commercial Code of Practice was endorsed, permit conditions were updated to reflect this. Verified by: discussion, internal review report.
	18.2 DEW will notify permit holders in writing of changes to permit conditions that will be implemented, should they choose to renew their permit, within one month of such changes being approved.	Achieved	No relevant changes to permit conditions during the life of this plan (the change described under PI 18.1 relating to the change in permit conditions due to the revised COP was implemented by applying it to all new permits). Verified by: internal review report.
19. DEW will consider improvements to the sealed tag system as appropriate.	19.1 DEW will monitor technological developments in tagging systems, and consider trials of electronic tags (or other technologies), along with technological advances in other aspects of kangaroo management.	Achieved	Kangaroo Management Program staff have regular interaction with interstate counterparts regarding technological developments such as new tag types, harvesting apps and survey equipment. Verified by: internal review report.
20. DEW staff will undertake both regular and opportunistic monitoring of compliance by commercial kangaroo industry operators.	20.1 DEW staff and/or Biosecurity SA (Food Safety) staff will inspect field chiller premises at least annually during the life of this plan to ensure compliance with South Australian legislation and permit conditions. Chiller premises that are registered but known to be non-operational may not require regular inspection.	Partially achieved	Many field chiller compliance visits are conducted by DEW every year and these are routinely reported in the 'Compliance' section of the annual Harvest Report. The target to inspect all field chillers was not met in any year of the period; the highest level of inspections was in 2023, when inspections were conducted of 52 of 61 chillers that were in operation. Some field chillers are not currently active at any given time and these are not inspected; this is noted in the Harvest Reports, but the number of non-active chillers is not provided. Field inspections were severely compromised by COVID-19 restrictions in 2020 and 2021. No reporting was received on Biosecurity SA activities; also, this is not reported on in the Harvest Reports. It is possible that all chiller premises were inspected at least once annually by the 2 agencies' visits, but the purposes of the compliance inspections are different. Verified by: Harvest Reports, discussions.
	20.2 DEW staff and/or Biosecurity SA (Food Safety) staff inspect all kangaroo processing works in South Australia at least twice a year during the life of this plan to ensure compliance with South Australian legislation and permit conditions.	Partially achieved	Many kangaroo meat and skin processing works compliance visits are conducted by DEW every year and these are routinely reported in the 'Compliance' section of the annual Harvest Report. The target to inspect all works at least twice per year was not met in any year of the period; the highest level of inspections was in 2019, when 8 inspections of 5 meat processors and 2 inspections of 2 skin processors were conducted.

			No reporting was received on Biosecurity SA activities; also, this is not reported on in the Harvest Reports. It is possible that all kangaroo processing works were visited at least twice a year by the 2 agencies' visits, but the purposes of the compliance inspections are different. Verified by: Harvest Reports, discussions.
	20.3 DEW will develop Memoranda of Understanding with Biosecurity SA (Food Safety) and the Department of Agriculture and Water Resources during the life of this plan.	Not achieved	Some discussions were held with Biosecurity SA (PIRSA) regarding a memorandum of understanding but there was little appetite and the proposal has not been pursued.
21. DEW will ensure that all Kangaroo Field Processors are competent to achieve the standards set out in the Commercial Code, and other necessary requirements.	21.1 On receipt of Kangaroo Field Processor Permit applications, DEW staff will ensure that applicants have valid Firearms Proficiency accreditation, Wild Game Harvester Field Processing (Kangaroo) accreditation, a valid firearms licence (Class B7 or as directed by South Australian Police), and other licences and accreditation/s as required (e.g. Food Safety accreditations).	Achieved	All requirements are checked by DEW staff when applications are received, for new and renewing permits. See reporting under PI 17.1 for information on the permit system used. Permit portal: https://myportal.environment.sa.gov.au/ Verified by: discussion, internal review report, permit portal.
	21.2 DEW will liaise with training providers (e.g. TAFE SA) to ensure that the kangaroo field processor training syllabus is up to date with current legislation, the Commercial Code or any other standards approved nationally.	Achieved	TAFE SA is using the updated COP in its kangaroo field processor training modules and providing copies of the COP to trainees. Verified by: discussion.
22. Activities not following South Australian legislation will be investigated and where an offence has been committed, appropriate compliance action will be taken.	22.1 Reports of unauthorised activities and activities in breach of permit conditions are investigated, and where sufficient evidence is available, offenders are prosecuted and/or issued with Expiation Notices as appropriate.	Achieved	Investigations are undertaken into reports of unauthorised activities and activities in breach of permit conditions; these are documented in the annual Harvest Report, including the outcome of the investigation. Verified by: Harvest Reports.
23. The accuracy of industry returns will be continually monitored during the life of this plan.	23.1 During the life of this plan, incoming industry returns are scrutinised, and discrepancies are investigated.	Achieved	See reporting under PI 12.1 for general description of monitoring harvest returns. Kangaroo returns for field processors and meat processors are compared to ensure that the same number of carcasses harvested are sold. Any discrepancies are followed up on. Non-compliance investigations are reported in the Harvest Reports. Verified by: internal review report, discussion, Harvest Reports.

24. A compliance database will be maintained to support investigations, inspections, and audits.	24.1 DEW will maintain compliance records relating to the commercial kangaroo industry.	Achieved	Compliance records maintained: CIMIS (online compliance database), Salesforce (online), final copies of compliance actions / letters are stored on DEW network and filed as hard copies in permit holder's files. Verified by: internal review report.
Aim 6. Facilitate adaptive management and research			
25. During the life of this plan, further research using the population model (referred to in Aim 4) will be conducted to define ecologically sustainable kangaroo densities for CHSRs, which will replace the average population estimate as the trigger for releasing HAQ.	25.1 DEW will investigate ecologically sustainable kangaroo densities for species and harvest regions where a population model has been developed using the long-term data. These densities may then be used as the thresholds for releasing the HAQ and reducing survey intensity in the next management plan.	Not achieved	Little progress, because the model development did not progress as anticipated (see under PI 9.1) and could not be used to address management questions such as ecologically sustainable kangaroo densities in different CHSRs. Although some work towards CHSR-specific 'status and outlook reports' was undertaken, using historic datasets and modelled kangaroo abundance based on future rainfall scenarios, this was not completed due to model shortcomings. Also, DEW staff now consider that focusing on 'ecologically sustainable kangaroo densities' is not the best approach.
	25.2 DEW will ensure that the results of research using historical kangaroo harvest and management data are published in an appropriate form.	Achieved	See reporting under PI 9.1. Results have been presented in a report to DEW. Because there have been shortcomings in the model's applicability for DEW, publication for external audiences is not being pursued by DEW; therefore, the internal report is the appropriate form and the PI is considered met. Verified by: report from University of Adelaide.
26. Where practicable, adaptive management experiments will be performed to test deliberate management interventions during the life of this plan.	26.1 All proposals to undertake adaptive management experiments are reviewed and assessed by DEW in accordance with the criteria outlined in this plan.	Achieved	No proposals were received during the life of the plan. Assessed as achieved, although DEW did not undertake any actions towards this PI.
	26.2 DEW will ensure that all necessary approvals – including animal care and ethics – are obtained before commencement of experiments testing deliberate management interventions.	Achieved	No experiments were conducted during the life of the plan. Assessed as achieved although DEW did not undertake any actions towards this PI.
	26.3 DEW will ensure that all adaptive management experiments are continuously monitored and conducted according to approved conditions.	Achieved	No adaptive management experiments took place during the life of the plan. Assessed as achieved although DEW did not undertake any actions towards this PI.
	26.4 DEW will ensure that results of all experiments testing deliberate management interventions are published in an appropriate forum.	Unable to assess / In progress	No adaptive management experiments took place during the life of the plan. Unable to assess because there were no results to publish.

27. Where knowledge gaps exist, DEW will facilitate research into the biology and ecology of commercially harvested kangaroo species.	27.1 Issues associated with the ecology of harvested species and the management of the commercial harvest are identified by DEW, and research proposals are sought from universities and other research institutions during the life of this plan.	Partially achieved	The DEW Kangaroo Management Program has <u>identified</u> a relevant issue of interest: hybridisation of western grey and eastern grey kangaroos and issues arising around harvest and different quotas, identification and compliance. However, DEW has not <u>sought</u> research proposals. Verified by: discussion.
Aim 7. Undertake program reporting and review			
28. An annual report on the South Australian Commercial Kangaroo Management Plan 2020 – 2024 will be prepared and submitted to the Commonwealth.	28.1 An annual report on the operation of the South Australian Commercial Kangaroo Management Plan 2020 - 2024 for the previous calendar year is submitted to the Commonwealth by 31 March of the following year. At the time of writing, this report is titled the Commercial Kangaroo Harvest Report for South Australia.	Partially achieved	Annual Commercial Kangaroo Harvest Report is developed that meets the requirements of the Commonwealth. Sent to the Commonwealth slightly later than 31 March each year (2019 report - 1 April 2020; 2020 report - 1 April 2021; 2021 report - 4 April 2022; 2022 - 1 May 2023). Verified by: emails from DEW to Commonwealth, Harvest Reports.
	28.2 DEW will publish all annual reports prepared during the life of this plan on the DEW Kangaroo Conservation and Management webpage.	Achieved	Harvest reports for 2019, 2020, 2021, 2022 and 2023 are on the webpage. Verified by: Harvest Reports, webpage.
29. The review of the South Australian Commercial Kangaroo Management Plan 2020-2024 will commence no later than 12 months before the expiry of this plan.	29.1 The success of the current plan in achieving its goal is self-assessed by DEW, measuring the department's performance against the PIs in the plan.	Achieved	Completed and provided to the independent reviewer in March 2023. Verified by: internal review report.
	29.2 DEW will commence a review of the plan by November 2023.	Not achieved	Review commenced in February 2024.
	29.3 DEW submits a report on the results of the review to the Commonwealth for their information and is published on the Kangaroo Conservation and Management webpage. The report should summarise the results of the final review including an explanation of any proposed changes to the plan. It should also include an assessment of DEW performance against the performance	Unable to assess / In progress	In progress.

	indicators. The report should be submitted to the Commonwealth by 31 October 2024.		
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Appendix 3: Online survey questions for the review of the kangaroo management plan

1. Name (optional)
2. Who do you represent (for the purpose of this survey)?
 - ☐ First Nations interests
 - ☐ Animal Welfare interests
 - ☐ Environmental conservation interests
 - ☐ Kangaroo industry permit holder
 - ☐ Landholder or land manager
 - ☐ Government
3. Are you aware of the South Australian Commercial Kangaroo Management Plan 2020–2024?
 - ☐ Yes
 - ☐ No
4. If you answered yes to Question 3, how often do you read or consult the Management Plan?
 - ☐ Weekly
 - ☐ Monthly
 - ☐ Yearly
 - ☐ Rarely
 - ☐ Never
5. To what extent do you think that the SA Commercial Kangaroo Management Plan has met its goal to 'provide for the sustainable use of kangaroo species referred to in this plan in accordance with the principles of ecologically sustainable development'?

☐ Strongly agree	☐ Disagree
☐ Agree	☐ Strongly disagree
☐ Not sure	

6. Please explain your reasons for your answer to Question 5.
7. Are you aware of the Kangaroo Conservation and Management web page on the Department of Environment and Water (DEW) website?
- ☐ Yes
- ☐ No
8. If you answered yes to Question 7, which of the following documents are you aware of or have accessed on the Kangaroo Conservation and Management web page? (select all that apply)
- ☐ Harvest Report
- ☐ Quota Report
- ☐ Fact sheet: Kangaroo Management Information for Landholders
- ☐ Fact sheet: Kangaroo Management Field Processor Factsheet
- ☐ SA Commercial Kangaroo Management Plan 2020–2024
- ☐ Landholder consent form
- ☐ Permit application form
- ☐ Review of the previous kangaroo management plan
9. Do you use the web page to stay up to date about new information regarding kangaroo management (e.g. harvest quotas)?
- ☐ Yes
- ☐ No
10. What is your preferred method of communication with the Kangaroo Management Program?
- ☐ Email
- ☐ Phone
- ☐ Web page
- ☐ Other

11. Are you aware that the commercial harvest boundaries are available on DEW's free online mapping tool NatureMaps?

- Available at: <https://data.environment.sa.gov.au/NatureMaps/Pages/default.aspx>

☐ Yes

☐ No

12. If you answered yes to Question 11, do you use the mapping tool?

☐ Yes

☐ No

13. The Management Plan identifies potential negative impacts of harvesting on kangaroos, and DEW minimises the risk of these impacts through the use of specific management practices.

Impact: Overharvesting of kangaroos

Management practice: Kangaroo populations are annually monitored, sustainable quotas are set based on population estimates and harvesting is suspended when kangaroo populations are low (below the low population threshold).

Do you think this practice is effective at minimising the above impact?

☐ Strongly agree

☐ Disagree

☐ Agree

☐ Strongly disagree

☐ Not sure

14. Please explain the reasons for your answer to Question 13.

15. **Impact:** inhumane destruction of kangaroos

Management practice: Kangaroo field processors (shooters) must comply with the requirements of the National Code of Practice for Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (2020) as a condition of their permit and pass a shooting accuracy test before being issued a permit. Unannounced inspections of field chillers are routinely carried out by DEW wardens to ensure kangaroos have been shot as per the Code.

- Do you think this practice is effective at minimising the above impact?

☐ Strongly agree

☐ Disagree

☐ Agree

☐ Strongly disagree

☐ Not sure

16. Please explain the reasons for your answer to Question 15.

17. Do you believe that DEW adequately investigates reports of non-compliant activities relating to kangaroo management?

☐ Yes

☐ No

18. Please explain the reasons for your answer to Question 17.

19. Do you think that the commercial kangaroo industry is effective at reducing kangaroo numbers as part of managing total grazing pressure on properties?

☐ Yes

☐ No

☐ Not sure

20. Please explain the reasons for your answer to Question 19.

21. Are you aware of any knowledge gaps in kangaroo management that you believe require more research?

22. Do you have any further comments?

Appendix 4: Kangaroo Management Reference Group feedback

As described under Methods, DEW engaged with the Kangaroo Management Reference Group (KMRG) at its meeting on 19 April 2024, to obtain their input on the question: What are the key emerging issues or challenges for next 5 years that changes to the new kangaroo management plan would support?

The areas of discussion are listed below.

- Can we include eastern grey kangaroos in other areas?
- Can we consider 'grey kangaroos' generally to cover eastern and western greys?
- Tag prices (out of scope for this review)
- Better melding of commercial and non-commercial destruction and outcomes
- Increased compliance monitoring
- More focus on dependent young treatment
- Checks on alternative options prior to issuing Permits to Destroy Wildlife
- Improved monitoring of kangaroo numbers – are there more than is reported on? Would potentially provide opportunity to addressing overabundant populations or allow for more targeted funding and research
- May see more landowners erecting exclusion fencing as per NSW
- High Abundance Quota is important to keep in plan so can be activated if needed
- Consider overall economic profitability (e.g. tag / permit prices)
- Consider reporting on conservation work positives (e.g. yellow-footed rock wallaby recovery)
- Concern with any enabling of increased harvest should not be a priority as is at capacity for market.