

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Environment portfolio

Question No: 68
Hearing: Additional Estimates
Outcome: Outcome 1
Programme: Wildlife Heritage and Marine Division (WHM)
Topic: Queensland kangaroos and California
Hansard Page: Written
Question Date: 23 February 2015
Question Type: Written

Senator Rhiannon asked:

1. Regarding the Department's 2014 Report to the Californian legislator on the commercial harvest of kangaroos in Australia:

a) Page 2 of the report states that special quotas are used when "continuing damage from overgrazing by kangaroos has been demonstrated". May I please have the references to contemporary published science proving environmental damage from overgrazing by kangaroos, and the circumstances in which this happens please?

b) Page 2 of the report also states that "Queensland's overall 2013 population estimate of 32.8 million represented an increase of 8.7 million from the 2012 estimate" and that "rapid increases [in kangaroo populations] typically follow the breaking of drought conditions" and that "kangaroos are highly fecund":

i. How does this reconcile with the contemporary science that confirms kangaroos are slow-growing with low reproductive rates and normal 73% juvenile mortality rates?

ii. Given the contemporary science agrees that maximum population growth rate of macropods is 10% (Arnold 1991; Bilton & Croft 2004):

A: How does this a maximum population growth rate of 10% reconcile with the Department's assertion of a 36% increase in populations?

B: May I have references to the contemporary science showing this is possible in wild populations, and under what conditions?

c) Page 3 of the report states "a correction factor of 1.85% has ... been applied to common wallaroo estimates since 2011". Can the Department confirm that actual counts of observed animals are nearly doubled as suggested by this correction factor?

2. Page 2 of the report also states: "rapid increases [in kangaroo populations] typically follow the breaking of drought conditions" and that "kangaroos are highly fecund":

a) How does this reconcile with the published science that confirms macropods are a slow-breeding marsupial with low reproductive rates and normal 73% juvenile mortality rate (eg Arnold 1991)?

b) Is this statement based on popularly repeated myth? Please provide the published science.

3. The Department asserts juvenile kangaroo survival "is usually high 85-100%" based on just two papers from 50 and 30 years ago (Newsome 1965 & Shepherd 1981). However other science confirms high juvenile mortality (eg Caughley 1967); with Arnold (1991) reporting 73% mortality in the wild, with 50% taken by foxes (Banks et al 2000):

a) Would the Department confirm its assertion 85 to 100% kangaroo juvenile survivorship in the wild to independence please?

b) May I be advised which kangaroo scientists currently advises the Department that 85-100% juvenile macropod survivorship in the wild is normal?

4. Page 2 of the report also states: "female red kangaroos are able to have three young simultaneously" and "other species generally have two dependent young at any one time".

Considering that:

- a) Embryonic diapause confers no major reproductive advantage for the Reds and the Wallaroos in which it occurs (Dawson 1995);
- b) Averaged across species, it takes an average of 18 months for a kangaroo joey to become fully independent of its mother (eg Poole 1975; Jackson; Staker, L; Dawson 1995) effectively producing just one joey to independence pa;
- c) Juvenile mortality in the wild is high at 73% (Arnold 1991 refer to previous question);
- i. Can the Department confirm it is advising foreign government that a wild kangaroo doe can raise simultaneously 2-3 independent joeys per year? May I have references to the science that confirms this statement?

Answer:

1. a)

Coulson, G. 2007. Exploding kangaroos: assessing problems and setting targets. In Lunney, D., Eby, P., Hutchings, P. and S. Burgin. (eds.) *Pest or Guest: the zoology of overabundance*, pp. 174-181.

James, C.D. 2003. Response of vertebrates to fenceline contrasts in grazing intensity in semi-arid woodlands of eastern Australia. *Austral Ecology* 28: 137-151.

Herbert, C. A., Renfree, M. B., Coulson, G., Shaw, G., Trigg T. E. and Cooper, D. W. (2010). Advances in fertility control technologies for managing overabundant macropodid populations. In Coulson, G. M. and Eldridge, M. D. B. (eds.) *Macropods. The Biology of Kangaroos, Wallabies and Rat-kangaroos*. CSIRO Publishing, Collingwood, Australia, pp. 313-230

b) i) The four species of kangaroo subject to sustainable commercial harvesting have differing reproductive strategies; juvenile mortality therefore varies between species and regions, depending on predation rates, climatic conditions and stochastic events.

b) ii) A) Significant fluctuations in kangaroo populations in one year could be caused by a number of factors, including the effects of nomadism, whereby kangaroos move to areas of green pick following rain. Best practice scientific methodology shows that kangaroo numbers continue to remain within normal biological parameters.

b) ii) B) See answer to b) ii) A) The increase in population is based upon derived survey data (not published literature). Survey information is provided in Quota Reports which can be found on the Queensland Government website.

b) ii) C) The Queensland Government has confirmed with the Department that actual counts of observed animals nearly doubled.

2. a) See answer to Question 1b) i).

2. b) See, for example,

Adderton Herbert, C. 2007. From the urban fringe to the Abrolhos islands: management challenges of burgeoning marsupial populations. In Lunney, D., Eby, P., Hutchings, P. and S. Burgin. (eds.) *Pest or Guest: the zoology of overabundance*, pp. 129-141.

Fletcher, D. 2007. Managing Eastern Grey Kangaroos *Macropus giganteus* in the Australian Capital Territory: reducing the overabundance – of opinion. In Lunney, D., Eby, P., Hutchings, P. and S. Burgin. (eds.) *Pest or Guest: the zoology of overabundance*, pp. 117-128.

3. a) During the Department's assessment of Queensland's kangaroo management plan, the assertion of 85 to 100 per cent kangaroo juvenile survivorship was based upon the following peer reviewed literature:

Newsome, A.E. 1965. Reproduction in natural populations of the red kangaroo, *Megaleia rufa* (Desmarest), in central Australia. *Australian Journal of Zoology* 13(5): 735–760; and
Shepherd, N. 1981. Predation of red kangaroos, *Macropus rufus*, by the dingo, *Canis familiaris dingo* (Blumenbach), in north-western New South Wales. *Australian Wildlife Research* 8: 255–562.

Any new peer-reviewed research will be considered during the assessment of Queensland's next kangaroo management plan.

b) The Department does not have scientific advisors on kangaroo biology, but does seek ad hoc advice from recognised experts. Any new peer-reviewed research will be considered during the assessment of Queensland's next kangaroo management plan.

4. i) The Department advised in the 2014 California Report that a female red kangaroo can have three young simultaneously at different stages of development. One at embryonic diapause, one pouch young and one young at foot. Other kangaroo species generally can have two dependant young at any one time; one pouch young and one young at foot.

This advice was based upon robust scientific evidence describing reproductive strategies, which vary between species and according to factors such as climatic conditions and stochastic events. See reference below.

Pople, T. and G. Grigg. 1999. *Commercial Harvesting of Kangaroos in Australia*.
<http://www.environment.gov.au/node/16685>).