



Response to Questions on Notice to Professor Kingsford in relation to Inquiry into the proposed aerial shooting of brumbies in Kosciuszko National Park

The following relevant sections to my questions on notice are taken from the uncorrected transcript from three committee members on the NSW Parliamentary Inquiry.

The Hon. WES FANG: I have just found that it was the University of St Andrews in Scotland that developed the computer model that is being used to develop the range of numbers that we are seeing—the 12,000 to 22,000 or thereabouts. They reviewed the 2014 and 2019 reports from National Parks and Wildlife Service, and they had certain criticisms around the way that the implementation of that modelling occurred. In circumstances where the University of St Andrews, which developed the computer model, is criticising the implementation of that, does that not ring alarm bells? Let me rephrase. Should that ring alarm bells in relation to the academic rigours that have been applied to the modelling of these numbers?

Ms SUE HIGGINSON: Particularly in relation to 2014 and 2019 counts, the argument first came from the clusters. Because the cluster was below the recommended number of 60 to 80, there was then criticism about the application of the methodology and the extrapolation. However—and I tried to put this earlier—the 2020, 2021 and 2022 counts did not repeat that same issue. Given your aerial surveying, I wonder if you have an understanding of this cluster aspect?

The Hon. BOB NANVA: There's obviously a lot of controversy and conjecture around the count method that has vexed this issue for quite some time now. If I can just get to the detail of the 2023 sample—and you may wish to take this on notice. As I understand it, the 2023 survey involved 1,900-odd kilometres of transects across four survey blocks. That covered about 239,000 hectares of the national park. Given the width of the transects, you then effectively have 21 per cent of the total survey blocks. Some 411 clusters of horses were sighted, including 269 clusters in the northern block and 117 in the southern, which goes beyond the allegation that there are only 60 to 80 clusters, as mentioned by a witness this morning. Is there anything with respect to those findings and that approach that would stand out to you as requiring review?

Professor Kingsford Response

In preparing this response, I was provided with two documents, previously not available: Rexstad and Buckland (2016, 2019). These are relevant to the questions from committee members. In summary, these two review reports had compiled a range of questions of clarification on choices made in the modelling or phrasing. However, Rexstad and Buckland (2019) had no major criticisms of the modelling approach or the comparability between surveys.

In summary, the peer reviews completed by Rexstad and Buckland (2016, 2019), the organisation that 'developed the computer model', concluded that they had 'no concerns about design or field

methods' (Rexstad and Buckland (2019) in relation to the 2014 and 2019 surveys. Further, the subdivision of groups on the ground into groups defined by distance band was unusual but similarly conducted in the two years, allowing legitimate comparisons. The data analysis was 'consistent with standard practice', with 'rates of growth and inferences derived therefore appear to be properly computed' (Rexstad and Buckland 2019). Further, there was 'no reason to doubt the reported abundance estimates and the derived finite rates of population growth' (Rexstad and Buckland (2019). Likewise for the 2014 survey, the reviewers stated: 'We consider that the analyses of the 2014 data have been carried out to a high standard' (Rexstad and Buckland (2016).

In relation to survey effort, the 2023 aerial survey covered 21% of four survey blocks in Kosciuszko National Park, covering 2,745 km², with 1,939 km of survey effort (i.e. transect length flown). Surveys were concentrated in areas with the most feral horses: the Northern Kosciuszko Survey Block, the Southern Kosciuszko Survey Block, the Cabramurra Survey Block and the Snowy Plains Survey Block. Numbers of clusters totalled 411, distributed respectively across the blocks: 269, 117, 3 and 22. The first two of these blocks, where well above 60-80 clusters were recorded, had 97.5% of the horse population. The requirement to include areas where horse density is lower in the same survey, such as the Cabramurra Survey Block, reflected the reality that horse density varies. Horses were absent in some areas, present in low numbers in others, and at high density in others. It means that the number of clusters recorded for Cabramurra and Snowy Plains was fewer than ideal, however it was better than omitting these areas, with their relative contributions not significantly influencing overall estimates.

References

- Rexstad, E. and Buckland, E. (2016). Peer review-Report on the the 2014 Survey of feral horses (*Equus ferus caballus*) in the Australian Alps. Centre for Research into Ecological and Environmental Modelling. University of St Andrews, Scotland. (Department of Planning, Industry and Environment – Record released under GIPAA-DPIE-21-1345
- Rexstad, E. and Buckland, E. (2019). Peer review-Report on the the 2014 Survey of feral horses (*Equus ferus caballus*) in the Australian Alps. Centre for Research into Ecological and Environmental Modelling. University of St Andrews, Scotland (Record #B18F).

Richard Kingsford

Professor of Environmental Science and Director of the Centre for Ecosystem Science

UNSW Sydney

1/2/24