## Bringing objectivity to wildlife management: welfare effects of guardian dogs

Benjamin L. Allen<sup>1,2\*</sup>, Lee R. Allen<sup>3</sup>, Guy Ballard<sup>4,5</sup>, Marine Drouilly<sup>6</sup>, Peter J.S. Fleming<sup>4,7</sup>, Jordan O. Hampton<sup>8</sup>, Matthew W. Hayward<sup>2,9,10</sup>, Graham I.H. Kerley<sup>10</sup>, Paul D. Meek<sup>4,11</sup>, Liaan Minnie<sup>12</sup>, M. Justin O'Riain<sup>6</sup>, Daniel M. Parker<sup>12,13</sup>, Michael J. Somers<sup>14</sup>.

## Author affiliations

<sup>1</sup>University of Southern Queensland, Institute for Life Sciences and the Environment, Toowoomba, Queensland 4350, Australia. Email: <a href="mailto:benjamin.allen@usq.edu.au">benjamin.allen@usq.edu.au</a>

<sup>2</sup>Centre for Invasion Biology, Mammal Research Institute, University of Pretoria, Pretoria 0002, South Africa.

<sup>3</sup>Robert Wicks Pest Animal Research Centre, Biosecurity Queensland, Toowoomba, Queensland 4350, Australia.

<sup>4</sup>Ecosystem Management, School of Environmental and Rural Science, University of New England, Armidale, New South Wales 2351, Australia.

<sup>5</sup>Vertebrate Pest Research Unit, New South Wales Department of Primary Industries, Armidale, New South Wales 2350, Australia.

<sup>6</sup>Institute for Communities and Wildlife in Africa, Department of Biological Sciences, University of Cape Town, Upper Campus, Rondebosch, 7700, South Africa.

<sup>7</sup>Vertebrate Pest Research Unit, New South Wales Department of Primary Industries, Orange, New South Wales 2800, Australia.

<sup>8</sup>Murdoch University, Murdoch, Western Australia 6150, Australia.

<sup>9</sup>Conservation Biology Lab, School of Environmental and Life Sciences, University of Newcastle, Callaghan New South Wales 2308, Australia.

<sup>10</sup>Centre for African Conservation Ecology, Nelson Mandela University, Port Elizabeth 6034, South Africa.

<sup>11</sup>Vertebrate Pest Research Unit, New South Wales Department of Primary Industries, National Marine Science Centre, Coffs Harbour, New South Wales 2450, Australia.

<sup>12</sup>School of Biology and Environmental Sciences, University of Mpumalanga, Nelspruit 1200, South Africa.

<sup>13</sup>Wildlife and Reserve Management Research Group, Department of Zoology and Entomology, Rhodes University, Grahamstown 6140, South Africa.

<sup>14</sup>Centre for Invasion Biology, Eugène Marais Chair of Wildlife Management, Mammal Research Institute, University of Pretoria, Pretoria 0002, South Africa.

\*Corresponding author.

The use of large carnivores and guardian dogs as biocontrol tools against other animals is increasingly recommended despite an absence of assessments of their welfare effects. We provided the first attempt at such an objective assessment in Allen et al. (2019), based on a recognised methodology and as per our commitment to evidence-based wildlife management. We concluded that their very nature means that "large carnivores and guardian dogs cause considerable lethal and non-lethal animal welfare impacts to the individual animals they are intended to control", and that these impacts "should not be ignored or dismissively assumed to be negligible." Harmful impacts arise because large carnivores and guardian dogs scare, displace, threaten, attack and kill other animals.

Johnson et al. (In press) sought to downplay and dismiss these effects for livestock guardian dogs. However, Johnson et al. (In press) inadvertently acknowledge and evidently support our assertions that guardian dogs indeed have these effects when they state that guardian dogs displace or create 'avoidance' by predators, engage in 'aggressive interactions' with them, and 'attack and kill' them at times. These effects both we (Allen et al. 2019) and Johnson et al. (In press) describe constitute harm, and thus their concerns about the utility of our assessment are void. To claim that guardian dogs do not harm the animals they are intended to guard against is contrary to the established ecological principles and theory (e.g. the ecology of fear, and its effects; Creel 2018) that are used to justify and promote their use in the first place. Support for the claim by Johnson et al. (In press) that the welfare effects of quardian dogs are negligible and should be dismissed would require provision of evidence showing that the target animals are not negatively affected by guardian dogs in any way and that guardian dogs do not instil fear in target animals, or change their behaviour, or reinforce this fear with agonistic interaction when needed. The examples given by Johnson et al. (In press) show the exact opposite of this. We also find it concerning that Johnson et al. (In press) seek to have animal welfare harm to wild predators be ignored or dismissed by 'farmers, land managers, ethics committees, governments agencies and NGOs' because the welfare reality of guardian dogs does not support their narrative. Such an attitude is what people concerned about animal welfare should be working to eliminate.

Animal welfare is the responsibility of everyone involved in wildlife management, and there is a clear need for objective assessment of all management tools, including guardian dogs. We do not disparage or discourage the use of guardian dogs or large carnivores and we encourage continued interest in them as potential tools against troublesome wildlife. However, we reiterate the importance of explicit and objective consideration of their obvious animal welfare effects.

## References

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