

**IN THE ENVIRONMENT COURT  
AT CHRISTCHURCH  
I MUA I TE KOOTI TAIAO O AOTEAROA  
KI OTAUTAHI**

ENV-2018-CHC-34

**IN THE MATTER OF** the Resource Management Act 1991

**AND**

**IN THE MATTER OF** appeals under clause 14 of the First Schedule to  
the Act

**BETWEEN** **BEEF+LAMB NEW ZEALAND LIMITED**

Appellant

**AND** **SOUTHLAND REGIONAL COUNCIL**

Respondent

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**WILL SAY STATEMENT OF DAVID ROBERT STEVENS FOR  
BEEF+LAMB NEW ZEALAND  
29 October 2021**

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Solicitor/Counsel: CP Thomsen/CH Luisetti

I, **DAVID ROBERT STEVENS**, scientist of Mosgiel, **WILL SAY**:

1. I am a senior scientist in the Agricultural Systems and Reproduction team, Digital Agriculture Centre of Excellence, at AgResearch Ltd, based at the Invermay Research Centre, Mosgiel, New Zealand.
2. My qualifications are B Agric Sic (Hons), M Appl Sci (Lincoln University) and PhD (North Carolina State University).
3. I have 38 years experience researching pasture agronomy, animal nutrition, farmer practice change and farm systems across all ruminant enterprises currently farmed in New Zealand.
4. I have published over 70 journal articles, 60 conference articles, six book chapters and given many (400-500) presentations to scientific and industry groups. I have also been involved in the co-development of three websites for sectors of the agricultural industry.
5. I have received the following awards:
  - a. 2019 – Recipient of the AgResearch Science Impact Prize for contributions to the expansion of the dairy sheep industry.
  - b. 2012 Recipient of the New Zealand Grassland Trust Grassland Contribution to Regional Agriculture Award (Southland).
  - c. 2007 Recipient of the Sir Arthur Ward Award for science communication, NZ Society of Animal Production.
  - d. 2004 Recipient of the Technology Transfer in Pastoral Farming Award, NZ Grassland Association.
6. I confirm this will say statement has been prepared in accordance with the Code of Conduct for Expert Witnesses set out in the 2014 Environment Court Practice Note. I confirm that the opinions I express in this statement represent a summary of my true and complete professional opinions. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

7. I have been asked to give evidence on the exclusion of sheep from waterways as a way to control contaminants of concern. Specifically, the necessity and cost of fencing as a mean to control access to waterways that results in contamination.
8. I agree that larger ruminants, such as pigs, deer and cattle should be excluded from waterways. However, decisions to exclude sheep from waterways need to be evidence, risk and impact-based. Material considerations include:
  - a. Sheep, due to their behaviours, very seldom enter waterways of their own volition.
  - b. Sheep, due to their low water requirements, typically use natural waterways as a water source only in conditions of, either, extreme water requirement due to climatic conditions, or when food-sourced water is restricted by low intake or high dry matter concentration (such as hay feeding). These conditions are rare, and, when they occur, are usually limited to muzzle contact with water.
  - c. Sheep, due to their relatively small body size, have little impact on the integrity of the banks of waterways.
9. Therefore, sheep contribute a relatively low loading of contaminants to waterways.
10. Sheep do have relatively high E Coli/bacterial loading potential for waterways because of the higher bacterial loadings in dung (than cattle). However, the occurrence of these contaminants in waterways is related to surface runoff of water from land to streams, and stocking rate. Overland flow events can be managed as critical source areas without the need for permanent fencing.
11. Management of critical source areas is an important discipline in farm planning and should be undertaken on all commercial farming enterprises.

12. Mitigations to manage critical source areas (and detailed in farm plans) could include:
  - a. Management of stocking rates.
  - b. Temporary fencing of riparian margins at times of elevated risk e.g. higher than usual stocking rates.
  - c. Appropriate placement of sheep in the landscape.
  - d. Use of planted riparian margins and buffers.
  - e. Variations in seasonal management of areas adjacent to the waterways, such as temporary exclusion during autumn to allow grass buffers to develop before potential overland flows in winter.
13. The cost to fence to exclusively exclude sheep from waterways is not generally justified when considered against the risk and the mitigations available outlined above.
14. Fencing of sheep requires permanent fencing of 7 wires/netting to ensure surety of exclusion and longevity of the investment. Topography plays a key part in the costs of fencing, especially for sheep. Fencing in the hill country is impacted by increased fencing complexity (angles, steepness and the need for anchors). It increases in intensity as the number of potential waterways increases and riparian margins increase due to the complexity of the terrain. For example, based on a New Zealand study using overseas data:
  - a. Fencing requirements on farms of slope under 5 degrees has been estimated to be approximately 22 m/ha at a cost of approximately \$12/m, or \$264/ha.
  - b. Fencing requirements on farms of slope over 25 degrees has been estimated to be approximately 123 m/ha at a cost of approximately \$16/m or \$1968/ha<sup>1</sup>.

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<sup>1</sup> Obadovec et al (unpublished) (2020).

15. Farms vary in their ability to pay for riparian fencing:
- a. A typical sheep and beef farm of slope under 5 degrees has a before tax profit of approximately \$400/ha.
  - b. A typical sheep and beef farm of slope over 25 degrees has a before tax profit of approximately \$90/ha<sup>2</sup>.

D R Stevens

29 October 2021

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<sup>2</sup> Ibid.