Expert Conference – Farm Systems – Joint Witness Statement (No. 3)

Topic: Proposed Southland Water and Land Plan – Southland Regional Council

Date of conference: 20 July 2022

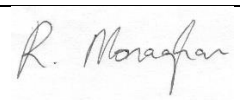
Venue: Remote AVL

Facilitator: N/A

Recorder: Isabelle Harding

Attendees

1 Witnesses who participated and agreed to the content of this Joint Witness Statement (JWS) by signing it on 20 July 2022

Name	Employed or engaged by	Signature
Ross Monaghan	Southland Regional Council	
Tom Orchiston	Wilkins Farming	
Dr Dawn Dalley	DairyNZ, Dairy Interests	

Environment Court Practice Note

2 All participants confirm that they have read the Environment Court Consolidated Practice Note 2014 and in particular Section 7 (Code of Conduct, Duty to the Court and Evidence of an expert witness) and Appendix 3 – Protocol for Expert Witness Conferences and agree to abide by it.

Experts' qualifications and experience

3 These are set out in each expert's Will Say statement.

Participants

Dr Ross Monaghan

Tom Orchiston

Dr Dawn Dalley

Attachments to this JWS

4 List of Questions for the Farm Systems Experts.

Conference outcomes

5 The Farm Systems conference answered a number of technical questions that were provided by the Court.

Attachment 1 – Farm Systems Expert Questions:

Farm systems

<u>High Risk Winter Grazing on Pasture:</u>

6. Overall question: what is the appropriate definition for high risk winter grazing on pasture? As part of answering that question, it may assist to answer the questions at 7 – 11. Please provide reasons for your opinion.

We don't think that the post grazing residual value is a useful indicator to define high risk pasture wintering.

We think that the amount of imported supplementary per hectare is the most practical option available at this time. However, we ideally think that case study assessments are required to help inform the setting of any supplementary feeding threshold value. Further explanation is provided below, particularly at question 7.

We expect that the environmental risks from pasture-based wintering are less than from crop-based wintering for an equivalent grazing pressure.

7. As the intention is to identify only those winter grazing activities on pasture that are associated with a high risk of contaminants loss, does the definition arrived at by the planners for high risk winter grazing on pasture achieve this? If not, what improvements or other measures should be used? What range of grazing practices would be captured by the definition?

In part, but the post-grazing residual thresholds are impractical for two reasons, firstly it is a difficult metric to measure consistently and secondly, there is very little information that quantifies the relationships between post-grazing residual and environmental losses. A nutrient budget tool can be used to guide assessments of nitrogen leaching risk under various scenarios of increased supplementary feed input, however similar tools do not exist to guide the assessment of sediment, phosphorus and microbial contaminant risk. Ideally, any definition of "high" risk winter grazing would be informed by case study assessments of how N leaching risk and soil loss risk changes as supplementary feeding levels increase.

In the absence of such information, a supplementary feeding threshold is probably a useful proxy to indicate categories of “high” risk winter grazing. However, given the subjective nature of defining “high” risk, it is difficult to defend a specific threshold.

8. *If a “grazing pressure” or other metric of intensity was to be used for intensive winter grazing, could it also be used for high risk winter grazing on pasture?*

At face value, the answer would be yes, but is there a need for a grazing pressure assessment given the wording of Policy 16 1ba(i) which is “ensuring that the establishment of new or further intensification of existing dairy farming of cows or intensive winter grazing activities, does not result in an increase in nitrogen, phosphorus, sediment and microbial contaminant discharges”? The proposed “grazing pressure” metric would be challenging because it is unfamiliar to famers and regulators and might be difficult to baseline due to inconsistent availability of historic records for all farms over a two to three year time frame which would be required for robust baselining.

9. *Is “pasture residual” capable of being measured objectively. Is it defined in any guidance material or existing documentation?*

Yes, it is technically possible to objectively measure pasture residual but probably impractical to do accurately at scale. There is no relevant documentation available that would be helpful for this type of measurement at scale. Some of the methods for estimating pasture mass, such as the rising plate meter would not be appropriate for use in this situation.

10. *Is “pasture residual” a commonly understood term in the farming and farm advisory community?*

Pasture residual is a commonly understood term in the dairy industry but it is not as widely used in sheep, beef and deer farming. Most farm advisors should be familiar with this term. While familiar with the term, few will be experienced with assessing it within the ranges relevant to “high” risk winter grazing activity with any reliability.

11. *Regardless of whether high risk winter grazing on pasture is to be managed through a separate rule or through Rule 20 with specific standards and guidance incorporated within Appendix N, what constraints should there be (if any) in relation to:*

(a) *Area*

(b) *Slope*

(c) *Setbacks*

(d) *CSAs*

(e) *Other things?*

The dairy interests do not believe there is the need for a separate high risk winter grazing rule but that the risks be dealt with in Rule 20 and the FEMP. RM has no opinion on this matter.

We think that all the good management measures relevant to slope, setbacks and critical source areas for intensively managed winter crops (IWG) are also relevant to high risk pasture winter grazing systems, although, assuming that pasture does provide some level of soil armouring or protection, and a more developed rooting structure, the degree or extent of requirement for these good management measures is likely to be less. However, we currently do not have the scientific basis to provide a revised set of quantitative standards/thresholds.

Because there is likely to be less risk associated with high risk pasture wintering than intensive crop winter grazing (IWG), the area limit for high risk pasture wintering should not align with intensive winter grazing of forage crops.

Intensive Winter Grazing:

12. *Is the grazing pressure metric arrived at in the last farm systems conference capable of identifying relative changes in intensity from year-to-year?*

Yes it would be useful in identifying relative changes between years but note our cautions above in answer to question 8 where we documented some practical challenges.

DD does not support the grazing pressure metric for the reasons outlined in question 8 and that there is insufficient information to establish a link between the proposed metric and when density reaches the threshold of “intensive”.

13. *Does the science confirm a clear link between ‘intensity’ (as would be defined by the grazing pressure metric) and adverse effects on water quality (or risk of adverse effects on water quality)? If not, why not?*

For nitrogen, science does confirm a link between intensity and increased risk of N loss to water. In the case of the other water contaminants (sediment, phosphorus and microbial), the scientific knowledge base is much more limited and the linkages are thus relatively poorly defined. Because of the lack of familiarity noted for this grazing pressure metric, the farming community will not have an awareness of how increased grazing pressure increases the risk

of contaminant losses to water. While there is a relationship between intensity and nutrient loss risk, for any given intensity the magnitude of this loss risk will vary between different soil types, climatic zones , topography and mitigation strategies. Thus, it is problematic to use such a metric as a consistent or robust predictor of environmental loss risks across the region.

14. *Is the grazing pressure metric a more useful tool than noting changes in stocking rate/type or is it supplementary to those?*

For wintering, a grazing pressure metric is likely to be more useful than stocking rate/type as it has a time component as well. However, as a new metric and having it expressed as relative stock units per unit area, it is something that would require farmers and rural professionals time to understand and become familiar with. Note our responses to question 13.

The grazing pressure metric is a helpful calculation that can inform land users of the grazing pressures that can be generated from winter grazing. However, it is not a metric that can be used alone as a quantitative predictor of environmental loss risks because these vary according to a range of features such as soil type, climate, slope, crop type etc. The metric can instead be helpful to guide farm planning decisions in locations where land use pressure is greatest and identify the need for practices that can mitigate loss risks.

15. *Referencing Mr Wilson's worked examples, is the grazing pressure metric arrived at in the last farm systems conference capable of identifying relative risk if the area of intensive winter grazing expands, and the stock numbers either (a) remain constant or (b) increase by some percentage?*

The pressure metric isn't intended for use in determining environmental outcomes, instead it could be used to give guidance to a triage process of planning decisions that might be required to offset any increase in grazing pressure such as would be expected if the number of animals wintered increased. Of the four examples put to us, only example three resulted in an increase in total grazing pressure – this was the only scenario where cow numbers increased. However, when expressed on a per hectare basis and assuming a consistent allocation of crop per animal, grazing pressures did vary depending on assumed crop yields, with high-yielding crops resulting in proportionately greater per hectare grazing pressures. Of note, we cannot assume that a reduction in grazing pressure will necessarily result in a reduction in N loss risk due to the potentially confounding effect of crop type.

DD and TO note that they have had insufficient time to go through the examples in any detail. We assume that RM's description of the grazing pressure and therefore relative differences between scenarios in the examples given are correct.

16. *Also referencing the worked examples, can the index demonstrate or inform relative change or absolute change in contaminant losses between different areas?*

No. See comments above.

17. *In the context of Appendix N and a winter grazing plan, what would grazing pressure identify, and how would the metric be used (if at all)?*

Please refer to answers to questions 13, 14 and 15 for how the metric could be used in Appendix N and a winter grazing plan. The grazing pressure metric could potentially be used alongside other factors such as slope, soil type, climate, etc to help determine what mitigations are best used. Based on the unfamiliarity of the grazing pressure metric it is difficult to determine where it fits in the winter grazing planning process at this point in time.