Hurunui District Landcare Group

Memorandum

20th September 2018
To Ned Norton – Environment Canterbury
From Joshua Brown – Hurunui District Landcare Group
Subject: Winter forage area in the Jed catchment
Status: Final

Introduction

Environment Canterbury (ECan) asked the Hurunui District Landcare Group (HDLG) to provide a supplementary memo on winter forage for cattle in the Jed catchment. This builds on the previous report, "Likely trends for dryland farming as a permitted activity in the Hurunui and Waiau zone; In the context of water quality" (Brown J. , 2018).

The question posed by ECan to HDLG was:

- What, if any change is likely to the winter forage for cattle area in the Jed catchment?

HDLG undertook a survey of commercial farms in the Jed, utilised local expertise, GIS analysis, and previous literature to answer these questions.

This report focuses on unirrigated properties as this is the group directly affected by the proposed plan change.

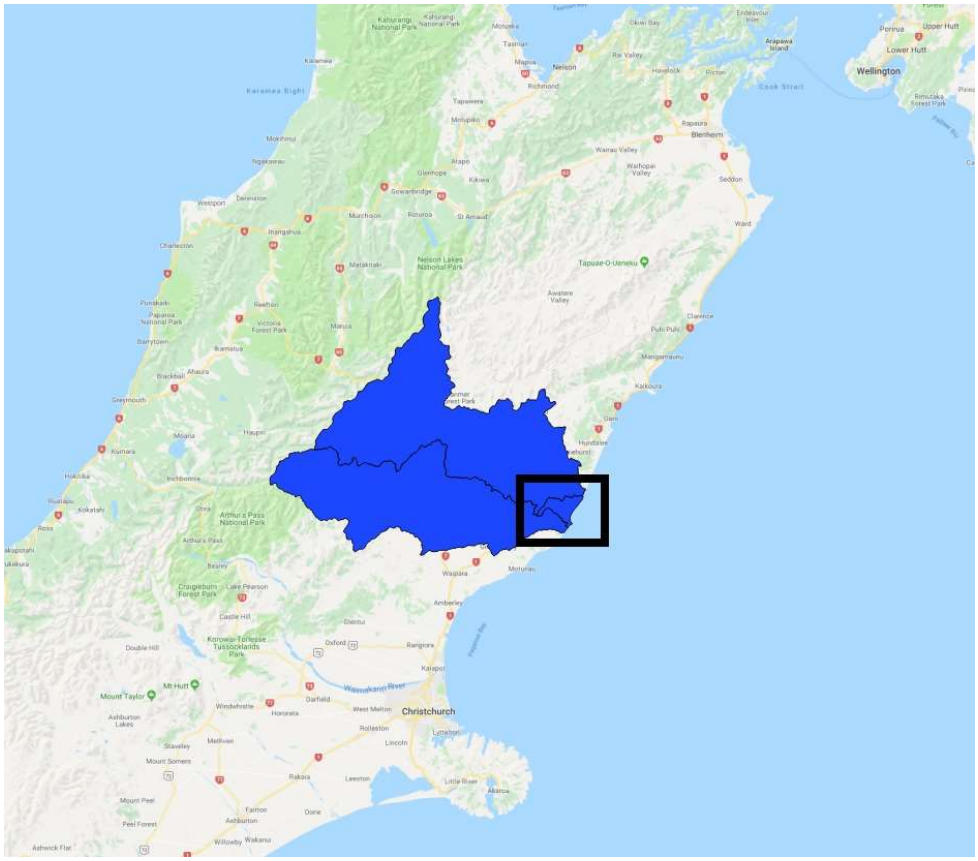

Figure 1. The Jed catchment in relation to the rest of the Hurunui Waiau River Regional Plan zone.

Key findings

- There are 21 commercial farms in the Jed catchment that are greater than 50 hectares (ha). All are dryland (unirrigated) except for one.
- 29% of these farms had winter forage for cattle this winter (2018).
- On the unirrigated farms:
    - There was an estimated 30ha of winter forage for cattle in 2018. This equates to 0.5% of the total catchment area. This dropped from 40ha in 2010.
    - The farmers surveyed predicted an increase to a total area of 55ha of unirrigated winter forage for cattle in future (185% of current).
    - It is not possible to distinguish from these results whether they indicate a trend or are year to year fluctuations as reported in the Hurunui report[1].
- The percentage of dryland farms with winter forage for cattle and the proportion this made up of their total farm was strikingly similar to the results from the Hurunui report. The surveyed dryland farms in the Jed also had very similar characteristics and the same climatic constraints as other dryland farms in the Hurunui, Waiau Zone. Therefore, linking the threads of the Hurunui report, it suggests that while there will be fluctuation in winter forage area for cattle, the long-term average is unlikely to show any trends.
- In total (including the irrigated property) there was 50ha of winter forage grazed by cattle in 2018.

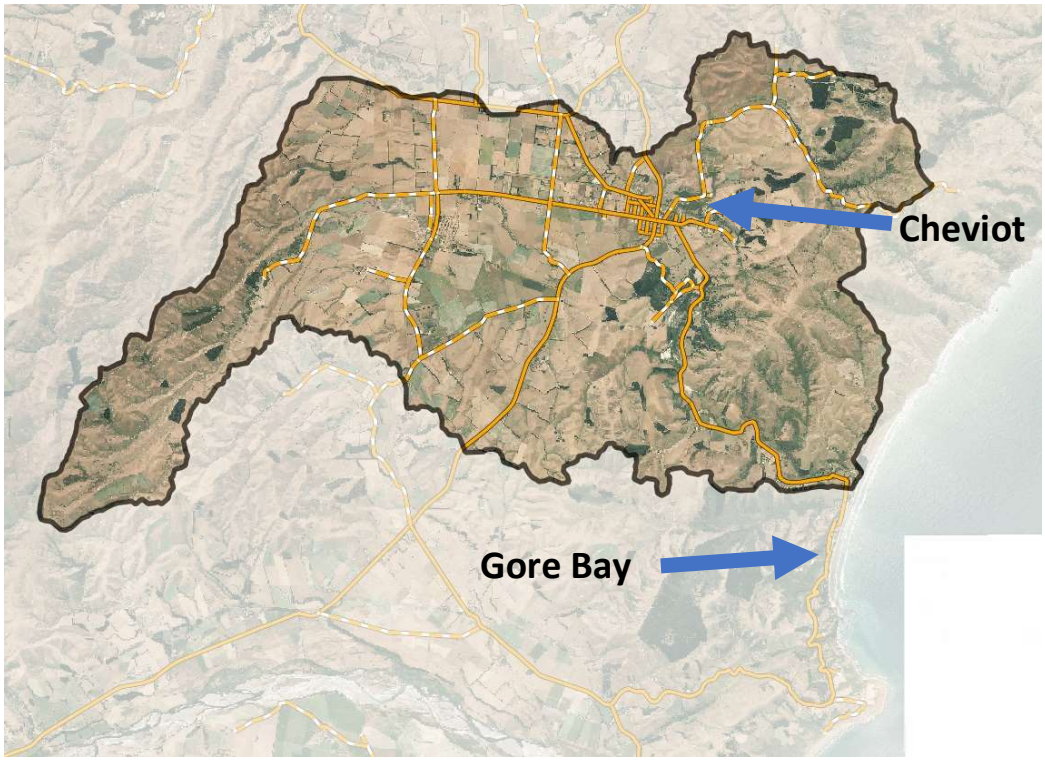

Figure 2. The Jed Catchment

[1] "Likely trends for dryland farming as a permitted activity in the Hurunui and Waiau zone; In the context of water quality" (Brown J. , 2018)

Methodology

HDLG undertook a semi-structured survey (Appendix 1.) of commercial farms in the Jed catchment. Commercial farms were defined as being greater than 50ha in size. These farms were identified using property information from Land Information New Zealand's (LINZ) data-base and subsequent GIS analysis. 52% (11) of commercial farms in the Jed were surveyed. Ten farms were unirrigated (dryland) and one was partially irrigated. The irrigated property was excluded from the results.

The survey consisted of three questions, quantifying past, present and future winter forage area for cattle and an additional section for comments on winter grazing cattle in the Jed. Winter forage was defined as either vegetable or brassica crops to be grazed by cattle over the winter months. It was conducted both in-person and over the phone.

GIS analysis of the catchment was also undertaken to give context.

The Jed river catchment

The Jed river catchment covers 6411ha in and around Cheviot, North Canterbury of which 4009ha is flat to rolling land (0-15 degrees). The remainder is hill country. Cheviot township sits on the flat and is surrounded by lifestyle blocks.

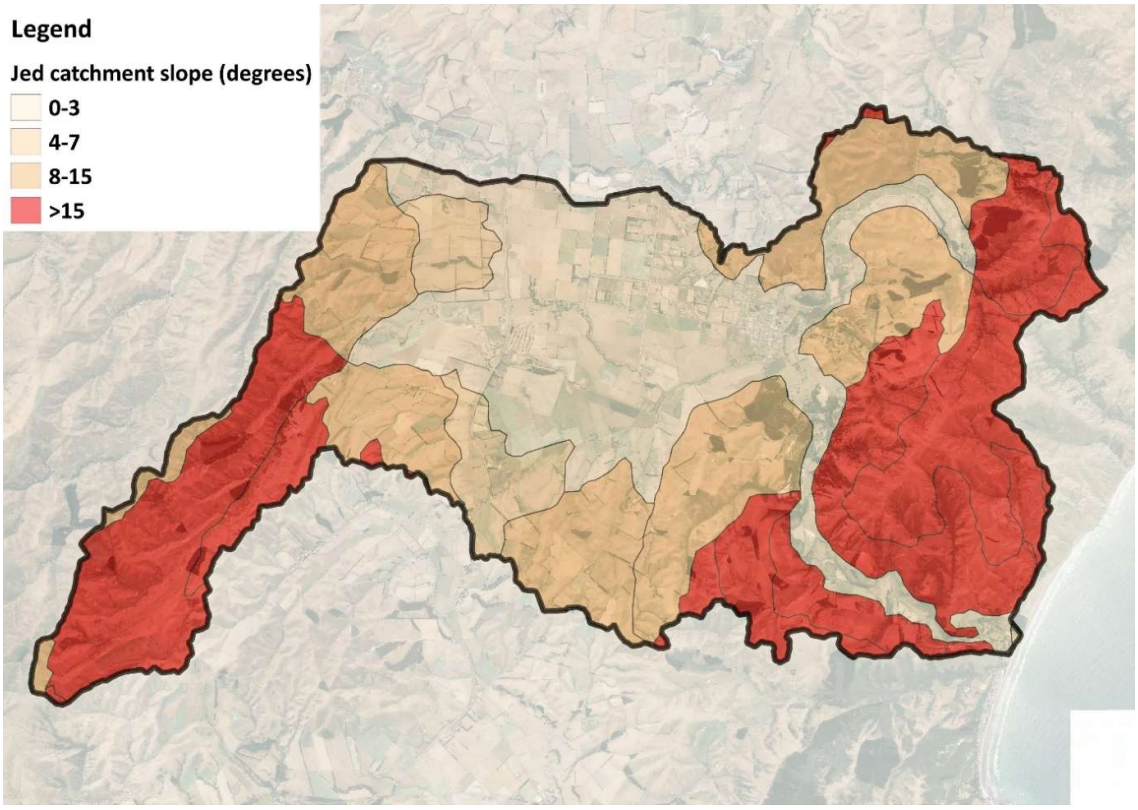

Figure 3. Jed catchment land slope

There are 21 farms larger than 50ha. These farms are largely sheep and beef breeding operations on the hill country and sheep, beef and arable on the flat to rolling land. There is one irrigated property in the Jed. Only three properties were identified to have grazed dairy cattle for the winter.

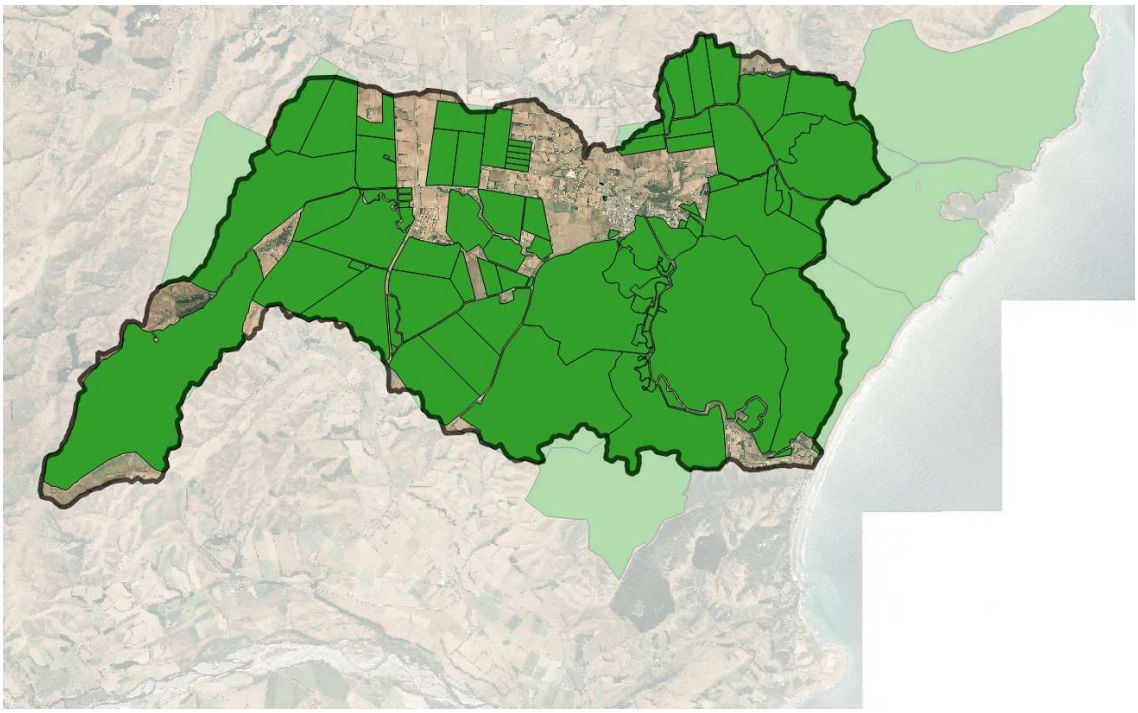

Figure 4. Farms larger than 50ha in the Jed Catchment

The flat and rolling land (less than 15 degrees) is almost entirely deep heavy silt loams. The hill country is covered by shallow, well-draining soils.

Survey results

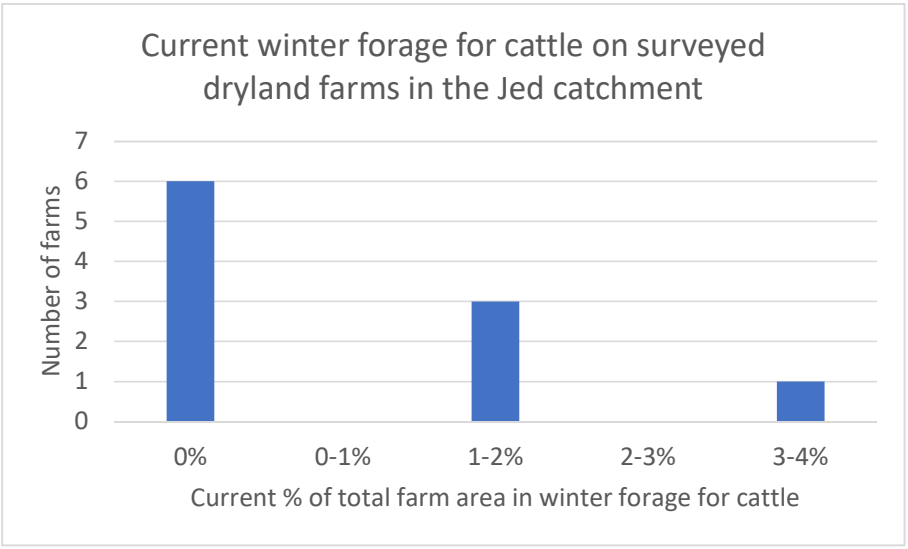

Table 1. Current winter forage for cattle on surveyed dryland farms in the Jed catchment

Of the 10 unirrigated farms surveyed, four had winter forage crop for cattle (WFC) this year (2018). On each of these farms the area of WFC was 5ha, the proportion of total farm area ranging from 1.2% to 3.6%.

Due to the small size of the catchment and surveyed farms, a visual survey of the catchment was also undertaken, both by car and by reviewing aerial photos. This, in conjunction with speaking to locals with a wealth of experience identified that there is potentially another 10ha of WFC on farms that were not surveyed. In total it was estimated there is currently 30ha of WFC on unirrigated farms in the Jed.

This estimation of an extra 10ha of WFC on un-surveyed farms was added to the previous, current and, future WFC area results from the survey. This resulted in an estimate of 40ha in 2010, 30ha currently and 55ha predicted area of WFC on dryland farms in the Jed.

On the surveyed farms the winter forage crop grazed this year was eaten by dairy cattle on two properties and beef cattle on the other two.

Of note from the surveyed farmers comments was their reiteration that the soils around Cheviot lend themselves better to cropping than winter grazing of cattle. The farmers were very aware of the risk of soil compaction on the heavier soils that they have in their area.

Discussion

The percentage change in WFC shows a 25% drop for the catchment followed by a plausible 183% increase from current into the future. These percentage changes though must be placed in the context of small areas relative to the catchment. In most cases the individual farm shifts in winter forage area was the sowing, or not, in one paddock.

It is not possible to distinguish from the results whether the decreases and increases in WFC are normal fluctuation as seen in the Hurunui or whether they indicate a trend. For those farmers that predicted an increase in WFC, their sentiment suggested the increase was “normal” dryland farming and was not “intensification”; Normal suggesting maximising the season and markets as they fall while intensification is a capital investment for the long term, generally equating to an increase in overall stock carrying capacity. This sentiment also suggests that the 183% predicted increase is not a suitable long-term average increase in WFC area for the catchment. Rather It is a plausible increase for a particular year if the conditions (market, climatic) aligned.

The 183% increase is not too dissimilar to the 150% plausible “worst-case” increase in WFC area identified in the Hurunui report but it must be noted reflects two different indicators. The 150% from the Hurunui report was a plausible long-term increase whereas the 183% shows likely fluctuation but does not indicate a long-term trend.

It is worth noting the results are sensitive to movement in WFC on from any one farm given the small number of farms. This is accentuated by the current small area of WFC (relative to the catchment), where an increase of one or two paddocks equates to a 25-50% total increase for the catchment. This makes predicting a “plausible worst-case scenario” of WFC increase problematic.

Most winter forage crops are grown on slopes of less than 15 degrees. While cropping on land greater than 15 degrees is possible it is rarely undertaken as it comes with its own risks and challenges (e.g. greater erosion risk). For these reasons there is unlikely to be a proliferation of WFC onto these areas. Further, hill country properties are general extensive, greater than 500ha in size and not lacking in options for crop placement. Therefore, placement of crops overwhelmingly

happens on land less than 15 degrees. If this hill country is deducted from the Jed catchment, the likely area available for winter forage for cattle is constrained to 4010ha (out of a total of 6411ha). Further, taking out forestry, townships, lifestyle blocks and conservation land takes the available area to approximately 3000ha. This land is largely on heavy, deep silt loams which farmers identified as better for arable farming than cattle grazing. This is not to say that it cannot happen, the results show it does. Rather, the expansion of cattle grazing winter forage will be balanced against other better suited land use options.

Overall the results and comments from the farmers received through this survey were consistent with the Hurunui report findings. Dryland farms in the Jed have similar characteristics to farms elsewhere in the Hurunui. Farmers must grow a product whilst managing risks from fluctuating markets along with physical factors such as variable weather, pests, and diseases. Of these, weather variability is the most consistently influential factor, to the extent that it characterises farming. This is true even if a farm is fully able to mitigate the risk by methods such as irrigation (Martin, 1996). On dryland farms, i.e., without irrigation, this characterisation is even more noticeable. Significant variation in year on year weather (especially rainfall) affects pasture production and subsequently productivity, finances and environmental outcomes on livestock farms (Li, Vibart, Dynes, Vogeler, & Brown, 2012). This has required farmers to develop adaptive management strategies to survive long-term. Examples include appropriate stocking rates, prioritising contingencies (such as supplementary feed stores) and allowing for failure in some components of the system whilst not compromising the entire operation. Climatic variability characterises dryland farming in the Jed and the adaptive and varying strategies used to manage the risk that define the farm systems. Each farm manages the risks in their own unique way.

The predicted impact of climate change adds to the challenge. All estimates suggest that the east coast of New Zealand is likely to get drier with more extreme rainfall events (Kenny, 2001). This will compound the climatic variability risk for dryland farms and potentially further constrain dryland farm systems (Gray, Reid, & Horne, 2011).

Conclusion

Dryland farms in the Jed have similar characteristics and constraints as others in the Hurunui, Waiau zone. Without irrigation they are constrained by climatic risk and have adopted farm systems that appropriately manage this risk. The area sown in winter forage crops that is then grazed by cattle has and will continue to fluctuate year to year, driven by the dryland farmers balancing the climatic and market risk and opportunities. The amount to which dryland farms intensify and push further into cattle winter grazing operations will be bounded by this balance. This in conjunction with the surveyed farmers sentiments that their WFC was a part of “normal” dryland farming suggests they have limited desire to aggressively intensify or dramatically change their operations to further winter grazing of cattle. This conclusion is supported by and reflective of the more in-depth Hurunui report.

References

Brown, J. (2018). *Likely trends for dryland farming as a permitted activity in the Hurunui and Waiau zone; In the context of water quality.* On behalf of the Hurunui District Landcare Group.

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