SUPPORT EVIDENCE FOR ORPG SUBMISSION TO ECAN PLAN CHANGE 7

Dr Bruce Allan **Oct 2020**

BACKGROUND

1. I hold a Masters in Biochemistry from Lincoln University specialising in the nutritive value of tussock grasslands, and a PhD, also from Lincoln, specialising in tussock grassland pasture ecology. I have 20 years of tussock grassland research and consultancy experience, initially at Tara Hills High Country Research Station (formally MAF and then AgResearch – 14 years), and then at AgResearch Lincoln.

2. I grew up on a high country property in the Upper Rangitata Gorge. Since 1996 I have lived at Peel Forest, South Canterbury, where I farm in partnership with my wife a 55 hectare property, and from where I have undertaken occasional tussock grassland research contracts, field studies and consultancy.

3. While at Tara Hills Research Station my research work of particular relevance encompassed: techniques of tussock grassland intensification; subsequent grazing management; and farm systems analysis (much of it in or at least relevant to the Mackenzie Basin).

4. Pastoral intensification research focussed on the 'improvement' techniques most suited to various land types, (including aerial oversowing of seed and topdressing with fertiliser, direct drilling with and without herbicide use), and the subsequent herbage production, including that from cultivated pasture with and without irrigation.

5. Grazing management research centred on semi-intensified tussock grassland, looking comprehensively at long-term effects of various domestic (merino sheep) stocking rates and the extent of subdivision fencing.

6. Farm systems analysis included sustainability modelling of the whole-farm enterprise, with particular focus on integration of the various farm land types within the farm.

7. I have been a research scientist and consultant on tussock grassland intensification for the past 40 years. Work of particular relevance includes:

    a) Pastoral advice for tussock grassland intensification on relevant high country properties including: Irishman Creek, Pukaki Downs, Glenrock, Simons Hills and Lochaber

    b) Ongoing monitoring of tussock grassland flora (20 Sites) for the Upper Rangitata Gorge Landcare Group.

    c) Member of the Parliamentary Commissioner for the Environment Team for the review of the High Country Tenure Review Process.

    d) Member of the Working Party for Variation 18 of the Timaru District Plan, representing the Peel Forest Enhancement Group.

    e) Contracted by the Timaru District Council along with Boffa Miskell ecologists to formulate Significant Indigenous Vegetation Definitions for Variation 18 of the Timaru District Plan

SCOPE OF EVIDENCE

8. While the Orari River Protection Group is concerned with the welfare of the whole Orari and its catchment, I focus my evidence on the tussock grassland catchment including and upstream of the Orari gorge. I present evidence of the value of the indigenous tall and short tussock communities and how theym contribute to catchment health and downstream water supply, what constitutes pastoral intensification, and various forms of pastoral intensification in terms of their effects

on indigenous vegetation and how these have contributed to the landscape and environment we see today. Based on my experience I offer some management and regultory recommendations that may help contribute towards the maintenance of desired ecological values.

THE VALUE OF TALL TUSSOCK

9. Our tall tussock (snow grass) and associated indigenous vegetation should receive the same value status as the giant podocarps in our indigenous forest. Individual tall tussock plants are very long lived, recover slowly from depletion, and once gone are very difficult to replace. These magnificent species have the unique ability to reduce water loss through evapo-transpiration (Davie *et al* 2006). Thus down stream water yield from tall tussock areas is greater and more consistent than that from other forms of vegetation such as introduced pasture or exotic forestry. Maintenance of our higher altitude tall tussock will thus help ensure higher and more consistent water flows in the Orari.

THE UNIMPROVED AREAS OF THE UPPER ORARI CATCHMENT

10. A considerable area of the upper Orari remains ‘unimproved grassland’. This land has a long history of extensive grazing. While these areas contain a mix of indigenous and exotic species, particularly browntop and hieracium (hawkweed), their historic management helps create the open landscape features that argueably still qualify as *High Naturalness .*

11. I believe careful extensive grazing of these areas with domestic animals, especially sheep, has and could continue to help maintain landscape values in a practical way by reducing the threat of fire and woody weed invasion, including wilding pines. Although existing ecological values of this land are likely to be continually compromised by this grazing approach, indigenous biodiversity is not excluded altogether.

12. It is my opinion the maintenance and even improvement of ecological values in such areas will require land management that includes minimal or low stocking rates, together with active rabbit and woody weed control. Note that indigenous vegetation recovery in depleted tussock grassland, where grazing is excluded, and rabbits and wilding pines are actively controlled, is possible (Walker *et al* 2016).

PASTORAL INTENSIFICATION AND SHORT TUSSOCK GRASSLAND

13. The ORPG have advocated for recognition of the upper Orari catchment as an area of *High Naturalness.*This present situation is largely a result of 150 years of generally low pastoral intensification, resulting in todays relatively minor landscape impact throughout the upper Orari catchment, and high quality water exiting the gorge (increasingly rare in todays Canterbury rivers). Contrast this to the lower Orari river where these values are largely lost due to a history of increasingly intensive pastoral development. The present upper catchment values are worth retaining.

14. I believe traditional oversowing and topdressing of short tussock grasslands should remain an acceptable form of intensification. Such practice has historically not impacted greatly on high naturalness. When managed well, the associated tussock and indigenous vegetation can be largely maintained. However, more intensive development of this country, and especially the increasing use of herbicides and nitrogen based fertiliser will have detrimental impacts on high naturalness. These practices should be restricted to strategic minimal use on cultivated pastures.

15. I believe a change in animal stock class, for example from sheep and beef to deer farming or dairying, should be regarded as a change in landuse (just as a change to forestry is) and thus should require consent application – regulated either through crown lease or district plan regulations.

16. When consents are evaluated, potential environmental impacts should always take precedence over any economic impacts (as per the original intent of the 1991 Resource Management Act).

17. The type and scale of pastoral intensification in the tussock grasslands has shifted considerably in the last two decades, and is now poised to shift at an even greater speed. This shift has, and will, continue to bring new landscape and ecological effects.

REFERENCES

Davie T. *et al* 2006: Tussock Grasslands and high water yield: A review of the evidence. *Journal of Hydrology NZ 45(2).*

Walker S, Comrie J, Head N, Ladley KJ, Clarke D, Monks A 2016. Hawkweed invasion does not prevent indigenous non-forest vegetation recovery following grazing removal. *NZ Journal of Ecology 40: 137–149.*