BEFORE THE	Canterbury Regional Council
IN THE MATTER OF	the Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010
AND	
IN THE MATTER OF	Submission on Proposed Canterbury Land and Water Regional Plan (2012)

Section 42A Report Volume 1 – Proposed Canterbury Land and Water Regional Plan
Section 9 Wetlands, Vegetation and Soil

STATEMENT OF EVIDENCE IN SUPPORT OF:

COMBINED CANTERBURY PROVINCES, FEDERATED FARMERS OF NEW ZEALAND

BANKS PENINSULA BRANCH OF FEDERATED FARMERS NORTH CANTERBURY

FEDERATED FARMERS HIGH COUNTRY

Introduction

1. My name is Raymond Keith Maw. I am a self-employed consultant with a land management planning background. In 1992 I was employed with the Canterbury Regional Council as a Resource Management Planner and then as a Senior Resource Management Planner from 1998. Prior to 1992 I held a Land Management Officer position with the Canterbury Regional Council and various Soil Conservation positions with its predecessor, the North Canterbury Catchment Board. I hold the degrees of Bachelor of Agricultural Science and Master of Resource and Environmental Planning (First Class Honours). I belong to the New Zealand Association of Resource Management, the Environment Institute of Australia and New Zealand and the New Zealand Biosecurity Institute.

2. I acknowledge that I have read the code of conduct for expert witnesses contained in the Environment Court's Practice Note dated 31 March 2005. I have complied with it when preparing my written statement of evidence and I agree to comply with it when giving any oral evidence.

3. I have not omitted to consider material facts known to me which might alter or detract from the opinions I have expressed.

4. The literature or other material which I have used or relied upon in support of my opinions are as follows:

   - *Land and Vegetation Regional Management Plan, Part IV Land Management Fires Canterbury Hill and High Country* 2005.
   - Statement of Evidence of Malcolm Richard Main for the Canterbury Regional Council 2003
   - Wildland Consultants (2008) Ecological Processes in the South Island Pastoral High Country. Report to Parliamentary Commissioner for the Environment [Online] http://www.pce.parliament.nz/publications/all-publications/change-in-the-high-country-environmental-stewardship-and-tenure-review
   - Rinne, J. N. (1996) Management Brief: Short Term Effects of Wildfire on Fishes and Aquatic Macroinvertebrates in the Southwestern United States. North American Journal of Fisheries Management. 16:653-658.
   - McGlone, M, S,; 2001: The origin of the indigenous grasslands of southeastern South Island in relation to pre-human woody ecosystems, NZ. J. Ecol, **25(1).**

5. The data, information, facts, and assumptions I have considered in forming my opinions are set below.

Ambit of evidence

6. I provide expert evidence on:
   - Land management fires in the hill and high country;
   - the adverse effects of land management fires;
   - Rule 5.152 and the 42A report recommended changes
   - determining an appropriate vegetative buffer;
   - appropriate protections for wetlands; and
   - consented activities.

7. Canterbury Regional Council notified the Proposed Land and Water Regional Plan on the 11th of August 2012. Rules 5.152 and 5.153 of this plan effectively replaced regional rules controlling burning of vegetation in the hill and high country in Part IV of the Land and Vegetation Management Regional Plan (the Burning Plan). As a Senior Resource Management Planner at Environment Canterbury I had extensive involvement in the development and finalisation of the Burning Plan, and subsequently was frequently called upon to provide technical assistance with the administration of 'burning permits'.

Land management fires in the hill and high country

8. The records of Environment Canterbury indicate that 4,000 to 10,000 hectares of hill and high country land is burnt per annum. While detailed information is not available, it is clear that burning is commonly carried out and occurs across many properties. This accords with the view expressed by Federated Farmers that burning is important to maintain land in production (or maintain access to areas of production land) on many Canterbury farms.

9. The objectives of land management fires on hill and high country land are to:
    - achieve a safe, low intensity burn, within the target area;
    - effectively remove regenerating or invading woody vegetation to enable grasses, tussocks and other ground cover plants to grow;
    - achieve compliance with legislation, including District and Regional Council Rules, Forests and Rural Fires Act (1977), and Conservation Act (1987).

    Farmers apply a variety of measures to achieve these objectives.

The adverse effects of land management fires

10. There are many situations where burning small areas of vegetation in the hill and high country will not cause adverse environmental effects. Rather than predetermining those situations, extent or area is a logical catch all. To that end, the Burning Plan *excluded areas less than one hectare*, with the exception of burning vegetation in wetlands, from the rules. To my knowledge there has been no reason put forward to justify changing this provision. I therefore consider it should be reinstated in the pLWRP.

11. The conditions at the time of burning, measures taken prior (in particular pre-burn spraying), the long return period (often greater than 10 years) and climatic and soil characteristics mean that land management fires in the New Zealand's hill and high country pose less of a risk to soil erosion, water quality and other environmental values than is generally supposed.

12. Unlike summer wildfires which have been shown to cause extensive root disturbance, loss of biodiversity, water contamination,[1] land management fires occur at a time of

[1] Rinne, J. N. (1996) Management Brief: Short Term Effects of Wildfire on Fishes and Aquatic Macroinvertebrates in the Southwestern United States. North American Journal of Fisheries Management. 16:653-658.

year when it is not too dry or too hot, burn only a small amount of fuel, and do not extensively disturb plant root systems.

13. The evidence of Mr Malcolm Main, presented during hearings on the Burning Plan concluded that:

> *…there is considerable uncertainty about the effects of land management fires on stream quality, because studies of the effects of this type of burn have not been undertaken. Nevertheless, under some circumstances, vegetation burning can have a profound effect on stream water quality. However any water quality effects arising from hill and high country land management fires would be minimised if the fires are lit during the prescribed period, and a buffer of at least 5 metres of unburned land is left between burn sites and waterbodies.*

The location, timing, extent and intensity of land management fires means that, unlike a wildfire, very little bare ground is exposed and the overall risks to water quality much less. In my view there is some substance to the observations of farmers that areas subject to land management fires are more stable and less likely to erode than if woody shrubs were allowed to recolonize the area. While this view is unsubstantiated by objective measurement, I see that there is merit in further investigation because it makes sense conceptually, and is based on the observations of people who have worked and lived in the hill and high country environment for generations.

14. New Zealand's pre-human vegetation consisted of wood species tolerant to all conditions but fire and the extensive tussock grasslands present in 1840 AD represented a new anthropogenic community created by periodic fire during the pre-European period that eliminated and repressed the previous woody ecosystems intolerant of fire[2]. While over-burning and over-grazing have caused significant damage to those grasslands, those practices have themselves been largely eliminated. Maintenance of an iconic but unstable seral vegetation system depends on disturbance for its continued existence. In particular, keeping undesirable woody exotic vegetation at bay is paramount.

15. There is some evidence that in the context of the already highly modified productive landscape of the hill and high country, that land management fires, combined with low intensity grazing, prevent *declines in the plant diversity, usually due to loss of small inter-tussock plants, both indigenous and exotic*.[3] As well as enabling on-going low intensity grazing (and the social and economic benefits this entails), land management fires may contribute to positive biodiversity outcomes within a productive landscape.

16. Land management fires play a particularly valuable role in the removal of wilding conifers and other pest plant species. The various species of wilding pine, already

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[2] McGlone, M, S,; 2001: The origin of the indigenous grasslands of southeastern South Island in relation to pre-human woody ecosystems, NZ. J. Ecol, **25(1).**

[3] Wildland Consultants (2008) Ecological Processes in the South Island Pastoral High Country. Report to Parliamentary Commissioner for the Environment [Online] http://www.pce.parliament.nz/publications/all-publications/change-in-the-high-country-environmental-stewardship-and-tenure-review

affect 40,000-50,000 ha of high country land, are very hardy, are spread by wind, and *if left uncontrolled, have the potential to form dense stands over most of the extensively-grazed high country, including alpine areas above the altitudinal limit of indigenous tree species.*[4]

17. The environmental effects of land management fires are complex and not what they might first appear to be. This means that substantive changes to existing regime must be undertaken in a considered manner and with a view to long term desired outcomes for the hill and high country environment as a whole (not just one aspect of it). Land management fires have significant social, economic and environmental benefits in that they enable continued occupation of high country farmland and suppression of wilding conifers, with little or no significant adverse effect on water quality or biodiversity.

Rule 5.152 and the 42A report recommended changes

18. Hill slopes by their nature contain numerous depressions and beds over which water can flow, form a bed and so on. As notified Rule 5.152 requires a 20 m setback from these features and is so restrictive as to exclude burning of vegetation as a permitted activity from most areas, which is not reasonable or balanced given the minimal risks of the activity to water quality.

19. The Section 42A report recommends the following change to condition 1 of Rule 1.152:

    Burning does not occur within <u>10 m</u>~~20 m~~ of the bed of a river <u>where the wetted part of the bed is more than 2 m wide</u> or lake or a natural wetland boundary;

20. The staff recommendation is more workable from a land management perspective because it relieves those undertaking land management fires from having to avoid ephemeral streams or minor water courses as these features are unlikely to have a wetted bed greater than 2 m in normal flow conditions.

21. While the recommended changes are helpful, significant issues remain around interpretability and the level of protection justified for the minimal environmental risk that land management fires pose to the values of surface water, the fringes of wetlands and very small wetland areas of little or no ecological significance often present in hill or high country pasture. Even with the changes recommended by staff, a 10 or 20 metre buffer remains unjustified and will result in the loss of significant areas of production land, and in some instances land that is necessary for access to other areas; or at least require a resource consent as a discretionary activity.

Determining an appropriate vegetative buffer

22. Appropriate buffer distances were discussed at length during the development of the Burning Plan. Expert witness evidence provided by the Director General of

[4] Wildland Consultants (2008) Ecological Processes in the South Island Pastoral High Country. Report to Parliamentary Commissioner for the Environment [Online] http://www.pce.parliament.nz/publications/all-publications/change-in-the-high-country-environmental-stewardship-and-tenure-review

Conservation relied on a buffer recommended by NIWA of 3-30% of slope length for a slope greater than 20 degrees.

23. Rebuttal evidence of Mr Malcolm Main (who provided evidence for Environment Canterbury) responded that the NIWA guidelines were developed for slopes with slow draining soils and high clay contents and recommended a 5 metre buffer to safeguard water quality. Mr Main noted that:
    - *These soils are uncommon in the areas of Canterbury Plains covered by the Plan's permitted activity rules. (i.e. 20-35 degree slopes between the 600 and 900 metre contours). The soils there are mostly composed of gravel, sand, and silt and have rapid infiltration.*
    - *On free-draining soils such as commonly occurs in these situations, the length of the slope really is immaterial, because the very rapid infiltration that occurs means that surface runoff does not concentrate with increasing distance down-slope.*

24. At the time I supported the opinion of Mr Malcolm Main regarding the width of a vegetative buffer needed to remove the majority of contaminants. In particular he noted that:
    - Land management fires do not produce large amounts of ash; and
    - The low intensity of fires outside of the hot, dry summer period have little or no impact on water quality.

    It is also known that vegetation regrows rapidly following land management fires and this prevents the exposure of extensive areas of bare ground.

25. In the intervening time since I gave evidence on the Burning Plan, my expert opinion has not changed.
    - There are no known problems with the 5 metre buffer that has been used for the past several years in the Burning Plan, which Rule 5.152 replaces;
    - Buffers greater than the minimum (whatever they are) will be used in most circumstances because it is difficult to precisely control the extent of a burn. Farmers prefer to use 'passive' methods of controlling fire, such relying on the tendency of fire to burn upwards or use of pre-burn sprays, than more precise (but more costly and environmentally damaging) methods such as cutting/dozing a firebreak to bare earth or using fire retardants; and
    - Wide vegetative buffers may make it more difficult to prevent escape of fire and safety issues during the undertaking of land management fires.

    I therefore hold to the view that a 5 m vegetative buffer achieves the proper balance of environmental protection and workability for plan users.

Appropriate protection for wetlands

26. The evidence of the Combined Canterbury Provinces of Federated Farmers outlines the problems that result when the definition of 'wetland' provided in Section 2 of the Resource Management Act (1991) is used as in criteria for permitted or prohibited activity rules, unqualified by other criteria.

27. I support the proposition that the use of the term 'wetland' in Rule 5.152 is likely to be unworkable as because neither Council officers, nor farmers can be expected to achieve a quick and certain assessment as to whether or not a wetland constitutes a 'natural ecosystem'.

28. In terms of RMA section 6(a), I do not see that land management fires, carried out in compliance with the conditions of the Burning Plan pose a significant risk to the natural character of the minor wetlands commonly associated with pasture in the hill and high country environment; to the extent that such wetlands have natural character. As with risks to water quality, risks to wetlands from runoff following a land management fire burn are considered minor. Other activities, such as the cutting/dozing of firebreaks to ensure fire does not encroach beyond 'setbacks' pose a significantly greater threat to wetland values than any land management fire.

29. There are relationships between 'minor' wetlands and pastoral farming practices that have not been recognised. Land management fire may even be beneficial to certain small wetlands on production land, for example by removing invasive woody plants, preventing colonisation by pest plant species, or maintaining tussock grassland that has enhanced 'rainfall capture' than areas dominated by woody species[5]. In some circumstances these wetlands will be a product of human activity that has replaced forest and scrub with grasslands, and (at least from the perspective of the wetland), it is likely to be desirable for this activity to continue.

30. I draw the attention of the hearing panel to pictures 7, 8, and 9 presented by Federated Farmers, which appear to invasive show woody species having been removed from a small 'wetland' during a land management fire.

31. Rule 1 of the Burning Plan provides for the permitted burning of vegetation within wetlands smaller than 3000 m^2 in area but with a setback of 10m for burning vegetation in wetlands of greater area. In terms of the total area of wetlands in Canterbury wetlands of 3000 m^2 or smaller, situated in production land, only account for a small fraction of the total areas wetlands, and possibly none of those that are ecologically significant. There is a point beyond which wetlands of the nature commonly found situated within 'wetter' areas of hill and high country pasture, become so small as to not constitute a 'natural ecosystem', be of any ecological significance, or to have natural character.

32. *The setback distance of 10 metres was arrived at by negotiation with representative parties and based on a precautionary approach. I am not aware of any difficulties with managing such a condition and reducing it to 5 metres would likewise be manageable. It would also be in accordance with Mr Main's findings regarding water quality protection.*

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[5] Wildland Consultants (2008) Ecological Processes in the South Island Pastoral High Country. Report to Parliamentary Commissioner for the Environment [Online] http://www.pce.parliament.nz/publications/all-publications/change-in-the-high-country-environmental-stewardship-and-tenure-review

33. In the interests of retaining a permitted activity rule for land management fires in the LWRP that is both enforceable and enabling, while ensuring that burning has a neutral or beneficial impact on wetlands I recommend the inclusion of the following condition:

> *Burning may only occur within 5 m of a wetland if:*
> - *it has not been found to be an ecologically significant wetland; and*
> - *the only vegetation burned are woody plant species in the riparian margin or overtopping or shading the natural wetland vegetation; and*
> - *the subject wetland is less than 3000 m^2 in area.*

Consented activities

34. Proposed rule R.152 defaults to a controlled activity under Rule 5.153, a condition (b) of which is: *Burning will not occur within 10 m of the bed of a river, lake or natural wetland boundary.* For reasons that have already been explained, this type of condition, which uses the very open RMA definition of 'bed of a river, lake or natural wetland excludes many areas of hill and high country that must be burnt from time to time to remain in production. This rule will very rarely be invoked because it concedes little beyond what is already provided as a permitted activity by Rule 5.152. Burning compliant with the provisions of the LWRP (such that it occurs at all), will be subject to a full discretionary activity under Rule 5.154.

35. To be more useful, Rule 5,133 should provide for situations where mitigation measures are available to manage any risk or the activity is beneficial, yet some oversight is required. The only exception of the time of the year, (condition 5) and any burning within a wetland greater than 3000 m^2. Those two matters could then be dealt with as a discretionary activity.

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