

Bushland at risk of continued tree and shrub thickening in Queensland

Dr Bill Burrows FTSE

Queensland has c. 50-60 M ha of woodland and open forest on its' agricultural holdings, within a total land area of c.174 M ha. [To provide some perspective this area of woody plant dominance on rural land is larger than the sum total of **all** rural holdings in NSW]. Those opposing any relaxation of tree clearing restrictions, on such land, assigned by government for agriculture purposes, do so with scant regard for the welfare of rural landholders, sustainable management of rural resources and many desirable conservation outcomes as well.

While there are good reasons why conservation should be an integral part of the management of rural lands, there are also many practical reasons why conservation has to be subservient to the needs of agriculture, on land designated for the latter purpose. Fundamental to this assessment is the strong evidence that the structure and composition of the 'intact' woodlands on agricultural lands has changed considerably over the past 150 years, with trees and shrubs continuing to 'thicken up' under current management. Consequently, vegetation frequently claimed for conservation in our agricultural woodlands is representative of communities present here now, and not necessarily of what was here then. Moreover, if we allow this 'thickening' trend to continue we are putting at risk the viability of many agricultural enterprises.

The prime target of the WWF's "Bushland at risk of renewed clearing in Queensland" document (Taylor 2013)¹ is land that has long been set aside by government for **agricultural land use** (farming and grazing). The import of this is that, when bans on broad-scale tree clearing were first contemplated by the State and Commonwealth, it was accepted by both levels of government and the major political parties that this would detrimentally impact agricultural production. It was therefore agreed that compensation needed to be offered to affected landholders for productivity foregone. [That the extent of compensation actually delivered, amounted to far less than that initially promised, is another matter].

Compensation was considered because governments acknowledged that tree clearing was a well established and generally necessary practice to maintain or increase productivity on Queensland's rural lands. Indeed it was a mandated requirement (condition of lease) on large tracts of country opened up for closer settlement during much of the twentieth century. Calculations of "living areas" for selectors were commonly based on the developmental potential of the lease. This determined the ability of the lessee/manager to increase livestock carrying capacity or farming potential of the holding, which hopefully in turn, enabled it to be managed as an on-going business.

Some holdings (e.g. balloted brigalow blocks) were simply not viable as an agricultural enterprise, unless cleared when first taken up. Many other land types were, and remain, subject to increased "thickening" of the over-storey or sub-canopy tree and shrub cover, or both, over time. Likewise trees are actively encroaching on some native grasslands^{2,3}. Examples of this changing structure and composition of the vegetation include mulga thickening in country east of the Warrego River^{4,5},

gidgee encroachment onto Mitchell grasslands⁶, increased eucalypt cover in the Desert Uplands⁷ and Central Highlands/Burdekin Catchment^{8,9,10} and tea tree invasion of grasslands in Cape York¹¹. Even National Parks and reserves abutting grazing land are subject to ongoing tree thickening e.g. the disappearing grassy balds of the Bunya Mountains¹², acacias invading grasslands on Moorinya N.P.¹³ and rainforest invading wet sclerophyll forest in the wet tropics¹⁴.

Throughout the grazing lands the development of dense woody weed layers beneath predominant canopy species has also been a widespread phenomenon. [In NSW such woody weeds are known as invasive native scrub (INS)]. Familiar examples of native woody weeds in Queensland are burrum or currant bush¹⁵, wattles, false sandalwood¹⁶, green turkey bush¹⁷, butterbush/silver cassia¹⁸, grey turkey bush/hop bush/poplar box¹⁹. Some species e.g. cypress pine can be both valuable timber species as well as damaging woody weeds²⁰. Others such as mulga can be important sources of drought fodder in dry times²¹ and weedy species limiting pasture production and hindering mustering in better seasons²².

The cause of this move towards woody plant dominance is widely thought to be changed fire regimes which followed the introduction of domestic livestock, and/or the elimination of Aboriginal management along with its' associated burning practices^{23,24,25}. This vegetation 'switch' is not restricted to Queensland^{26,27,28,29,30} and seems universal wherever Europeans and their domestic livestock have displaced hunter-gatherer societies³¹ previously inhabiting woodland/savanna landscapes.

The paradox of fire is that it has been difficult to emulate this influence under livestock grazing, while it undoubtedly played a key role in the evolution of our vegetation and its 'open' woodland community structure^{32,33}, especially under Aboriginal management. First, livestock consume much of the fine fuels which would otherwise be available to carry fire. 'Ungrazed' pastures also increase the spread and intensity of fire, which contributes to keeping woody plant populations in check. Second, the reality of our variable climate results in stock managers being reluctant to burn pastures for fear of exhausting feed supplies early in drought situations. [So when it was legal to do so much woody regrowth was stick-racked rather than burnt, because the former process conserved fodder growing within the regrowth cf. the latter which consumed it].

It is widely accepted that Aboriginals regularly burnt country to attract game (and facilitate human movement). This objective would be best achieved if patch burning was followed on some type of rotational basis. If such a burning regime led to land carrying a fire every 2-3 years many regenerating woody plants would be eliminated before they became sufficiently established to be able to survive fire^{34,35}. A neat biochemical analysis of grass tree stems reveals just such a fire frequency adopted by the Noongar people in pre-European SW Western Australia³⁶. It is therefore my personal perspective that grazing by domestic livestock is incompatible with the re-establishment of true remnant vegetation within Queensland's grazed woodlands³⁷.

Woody plants (native trees and shrubs) are considered to be weeds on agricultural holdings if they limit pasture productivity or prevent the cultivation of land required for more intense pasture or crop production. It is therefore highly relevant that a large

number of studies show there is a strong negative exponential relationship existing between potential pasture production and woody plant basal area (or stem density or canopy cover) for most of the species listed above^{38, 39, 40, 41}. Thus the presence of relatively few woody plants per unit area can significantly depress pasture yields.

The widespread and ongoing “thickening” of the canopy and sub-canopy layers in Queensland’s “intact’ forest and woodland communities has not deterred the Regional Ecosystem (RE) classifiers within government from continuing with the charade of describing this thickened vegetation as “Remnant” – clearly implying (in the vernacular sense, as well as in publication⁴²) that the vegetation structure and composition presently on site, is a residual and identical to that present in 1788.

As an example of this deception I am familiar with a property in SW Queensland where the original Lands Department surveyors in 1895 described an area of vegetation as “open patches of gidgee and box flats – fairly grassed, chiefly mulga grasses”. An aerial photograph taken in 1952 appears to still reflect this structure, while 2011 imagery suggests the same land is now completely dominated by woody plants. Yet since 2005 (and earlier⁴³) it has been described as a “remnant” plant community. Meanwhile, from 2005-2013, it has also undergone a series of flip-flop classification changes between RE 6.5.3 and RE 6.5.10 - suggesting this “remnant” area is in a continual state of flux, or the DNRM classifiers are using inconsistent methodologies. Additionally, a dense understorey of native shrubs (*Dodonaea*, *Eremophila* and *Senna* species), observable in 2006, does not appear to have been present on this area in 1895 or 1952.

The VMA 1999 Schedule (p.177, current as of 1 February 2013) defines remnant vegetation as meaning vegetation, part of which forms the predominant canopy, and which covers more than 50% of the undisturbed predominant canopy, *inter alia*. This is carefully worded so that woody vegetation which existed for hundreds or thousands of years with an ‘equilibrium’ canopy cover of say, 30% under pre-European management, could now have a canopy cover of between 15 -100% as a result of tree thickening⁴⁴ and still be classified as remnant vegetation! No wonder landholders think the VMA is designed to “stitch them up”.

One wouldn’t expect myopic conservationists to understand, but a common maxim of rural landholders is to develop the best country (that capable of the greatest productivity improvement) first. Yet in generally marginal country there can often still be found what I call “pockets of viability” on most holdings. These may be small flats in the vicinity of streams or drainage lines, patches of gidgee or blackwood, box flats on more favoured sites, or areas of better class soils suited to more intensive land use. Development of these zones can often turn a marginal enterprise into an acceptable living area.

The proposed changes to the VMA to allow the development of “high value agriculture” is practical recognition that this can be a significant influence on whether an enterprise is viable or not. Many years ago I came across a trite but insightful phrase that simply stated - “the only sustainable agriculture is profitable agriculture”⁴⁵. It is true that over short time frames agriculture can be profitable, but ultimately unsustainable. But more commonly, when faced with a non-viable enterprise, the owners will tend to flog their stock, the country and themselves before

they surrender the land to their financial institution or eventually 'walk off'. None of these outcomes can be beneficial for either agricultural production, sustainable management or conservation. So I find it passing strange that the WWF document (Taylor 2013)¹ rails against 'high value agriculture'.

The conservation lobby is also opposed to the bans recently imposed on the clearing of regrowth. The resilient nature of Queensland's woody vegetation means that one pass clearing is rarely fully effective in controlling woody species that limit agricultural production. In fact it is usually recognised that it may be necessary to treat a targeted area several times, before the woody plants are no longer competitive.

Regrowth is a consequence of clearing an area of designated agricultural land for which a permit was provided by the appropriate government agency, or for which a permit was previously not required (e.g. freehold land). No clearing operation is inexpensive. So allowing land to be cleared and then preventing subsequent (and necessary) regrowth control amounts to the imposition of damaging retrospective legislation, without compensation for the financial harm inflicted. This is obviously unjust, inequitable, and even darn right vindictive - targeting as it does landholders who did nothing illegal.

In any event regrowth following clearing is often of different woody plant composition to the pre-clearing community it replaced. In mixed eucalypt communities narrow leaved ironbark and gums are relatively simple to control, leading to regrowth that may be dominated by harder to kill bloodwoods. Likewise root suckering species are favoured post-clearing, compared with species that only regenerate from seed. This in turn can lead to significant changes in the fauna supported as well. Consider a community originally composed of brigalow, belah and wilga. Following clearing the regrowth will be predominantly a monospecific stand of dense brigalow suckers. Allowing the brigalow suckers to grow out will not restore the previous food source of glossy black and Major Mitchell cockatoos (belah seed cones) or eastern spinebills (nectar from wilga mistletoe flowers).

Donald Franklin⁴⁶ utilized reliable RAOU records, going back to the 1800's, to show that the marked decline in granivorous - grass seed eating - bird assemblages in Queensland's northern savannas, including the Desert Uplands, preceded any land clearing activity. However woodland thickening over a centennial time scale is well documented for this Desert Uplands environment in the State's central west^{47, 48, 49}. Meanwhile, as previously referenced³⁸⁻⁴¹, increasing tree/shrub cover severely depresses understorey grass production – especially on dry, infertile sites. In other words – more trees, less grass, fewer granivorous birds.

It is of particular interest that the Lake Dunn pollen record⁷ from the Desert Uplands not only mirrors the woodland thickening that followed the commencement of livestock grazing, but it also captured (through the sharp decline in the presence of eucalypt family pollen from 1990) the widespread tree clearing + drought that took place in the area after that time. [This tree clearing was motivated by the demonstrable benefits for pastoralism and the widely anticipated and telegraphed clearing bans that culminated in the VMA 1999]. Now here's the rub. A 2009 IBRA report has noted a recent increase in grassland birds in this region "*possibly reflects*

*the increase in cleared land*⁵⁰. ***Ipsa facto land clearing is helping to restore biodiversity values, lost as a consequence of past tree thickening.***

Finally the WWF document advances the cruel illusion that woodland resources on agricultural land will provide some type of carbon sink reward for rural landholders. First, let it be unequivocally stated that any such sink must be guaranteed to be kept in place, or replaced if lost, for 100 years before any advanced cash benefit would be forthcoming under the Kyoto Protocol, for example. No individual, government or company can honestly sign such a guarantee. Second, any sink measured with integrity needs to take into account both above and below ground carbon fluxes. The latter cannot currently be practically measured with adequate accuracy and precision over paddock, property or landscape scales. Third, the document states that the “difference between predicted standing biomass and maximum potential biomass was taken to represent the carbon sequestration opportunity from protecting and restoring native bushland”. Under these circumstances (potential biomass attained) any bushland on any property in Queensland would have no value for grazing or cropping anywhere in the State.

The most important message that rural landholders can convey to people in other industries and their urban cousins is that the business they are in is agricultural production – the production of food and fibre for Australian and international markets. It is not conservation. If the two can be combined and not limit the production potential of a property - well and good. But conservation superimposed on agricultural land use can restrict responsible development and management of woodland resources and so impact the viability of the enterprise. For example, it is made very clear in the documentation of most grazing homestead perpetual leases (GHPL) that the Purpose of the Lease is for ‘grazing and agriculture’. This of course applies to agricultural land in general.

Yet it is obvious from the WWF’s “Bushland at risk of renewed clearing in Queensland” document that conservationists want to ignore this inconvenient fact. Instead they are essentially demanding that woodlands on agricultural holdings should be seen as a simple extension of the State’s National Park and Reserve system. If they truly cared for the welfare of rural landholders and the contribution the latter make to the Australian economy, along with world food and fibre supplies, they would not target landholder’s ability to run a viable farm business. In turn, when farm businesses are profitable, they might be surprised to find good conservation outcomes will follow as well.

Endnotes:

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- ³⁷ As an agriculturalist, as well as an ecologist, I believe that landholders managing holdings assigned by government for agricultural production should have access to the best genotypes (plant and animal) available and appropriate to their environment. This is because our farm products generally have to compete on a world market. This does not rule out native organisms where that is the optimal choice e.g. there is no pasture more productive and better adapted to arid Mitchell grasslands than – Mitchell grass. Likewise buffel grass + *Leucaena* maintain ecological processes on former brigalow lands, but these introduced species are far more stable and productive than their native pasture alternatives. It is an absolute nonsense to imply that agricultural enterprises in Queensland should be solely dependent on native plants and animals – as some extreme conservationists are want to do.

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