

Sorting fact from fiction – questionable ‘science’ and ‘management’ that underpin Queensland’s Vegetation Management Act

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Thanks for the invitation to share some thoughts with you today. My talk looks at some of the alleged scientific foundations of Queensland’s Vegetation Management Act and their consequences for the sustainable management, and economic viability of grazed woodlands. In particular I question the classification of many widespread woodland communities as ‘remnant’, and therefore the accuracy of sub-divisions based on the supposed percentage of this so called ‘original vegetation’ remaining. I then raise future concerns for depleted urban water supplies and increased fire risks in near-urban areas; given the restraints the VMA now places on grazing management and productivity of this ‘remnant’ vegetation, coupled with widely acknowledged tree/shrub thickening in these woodlands.

The government maintains that its VMA is based on the best science. One may well ask – who told them that? And has anyone queried the basis of this oft quoted government assertion? From “children overboard” to the present “hospital waiting lists saga” we should all know by now that people who accept government pronouncements at face value, probably also still believe in fairies!

I am a woodland ecologist who has spent a lifetime studying Queensland’s grazed woodlands – for 40 years as a research scientist employed by the government itself. It is my considered opinion that the VMA is, at best, based on a very selective reading of the available science and, at worst, the framing of the Act and its regulations deliberately and capriciously ignored a large body of scientific research and economic data relevant to the management of vegetation on our grazing lands.

Given this perspective I believe it is very dishonest to claim the Act is based on the best available science. For example, let’s examine the concept of remnant vegetation. This description is applied to more than 50 Million hectares of Queensland’s grazed woodlands and is critical to decisions on how country is classified for future management. So called ‘remnant’ vegetation is being protected by the VMA because it allegedly represents original, pre-European communities. That is, its botanical structure and composition is claimed to be similar to that existing when the land was first released for grazing purposes. To test the validity of this claim we need to be guided by historical records, reliable observations and hard science.

Let’s start with some of the early records. The noted historian, Geoffrey Blainey¹ reported in his book, ‘Triumph of the Nomads’, that without aboriginal fires the grassy woodlands that occupied much of the fertile crescent in south-eastern Australia would have been scrubland or forest at the time of European occupation. Yet, he chronicled, a period of fifty years was sufficient to change the character of this savanna country when fires were suppressed by Europeans and their livestock. Blainey concludes that “the widespread ring barking, that was carried out at the **turn of the twentieth century**, occurred within

[#] Invited talk prepared for PRA Rally, Rockhampton, 6 October 2005 ^{*} Email: wburrows@iinet.net.au].
Current (4/2/2023) Web link: <https://www.keepandshare.com/doc22/111984/burrows-pra-talk-sorting-fact-from-fiction-web-access-address-given-at-end-of-doc-pdf-332k?da=y>

the increased tree density. The landholders were attempting to re-establish the original carrying capacity!", he said.

A witness told the Royal Commission² into the plight of western NSW grazing lands in **1901** "Generally speaking the Cobar-Byrock region was open box-forest country, with an occasional cypress pine tree upon it". However following the arrival of Europeans and their domestic stock there was "a cessation of bush fires that formerly occurred periodically. This afforded the noxious scrub a chance of making headway". [There was a follow-up Interdepartmental Inquiry³ into the same area and problems in 1969 – nothing had improved since 1901]. Today this dense shrub-woodland is a distinctive feature in all satellite images of Australia.

In his award winning book, 'A Million Wild Acres' Eric Rolfs⁴ writes evocatively of the settlement history of the nearby Pilliga Scrub in NSW – He observed "The cypress pines came up 10,000 to the hectare.-- --- 'One year the stockmen saw the little pines just to the top of the horses hooves' one man told me, 'The next year the pine tops brushed their boots as they rode. And a year or two after that – those old stockmen used to ride at ten past ten, knees cocked up from the saddle like wings – well, they had to jam their knees in hard behind the pads or the pines would have pushed them backwards out of the saddle. Soon they just mustered their stock and got out. There was no room for grass to grow.'"

It is not surprising therefore, that when the Australian Forest Profile series was compiled for White Cypress Pine⁵ in 1997 the author could state that "because of management changes white cypress pine forests currently cover a greater area than they did before European settlement".

By this reckoning, and assuming we wish to restore the original or pre-European status of our 'remnant' forests - the Queensland government's holy 'green' grail? - we should be clearing cypress pine out of those areas it did not occupy when Europeans arrived! Yet the government recently announced that it will include a ban on the clearing of cypress pine in its conservation plan for the western hardwoods region⁶.

Sir Thomas Mitchell⁷ camped in what is now Salvador Rosa National Park in 1846 and sketched the Carnarvon Range backdrop, depicting the hill-slopes sparsely timbered. The contemporary artist, Mandy Martin, returned to Mitchell's campsite in the late 1990's and took photos of the area sketched by him, in order to emulate his sketches. Now the hills are shown to support what I presume is dense lancewood forest.

Jim Gasteen's father took up a soldier settlement block in the Bollon district after World War 1. In 1986 Jim wrote⁸ that the ensuing decades were very dry and "in the absence of competition from ground layer species, and a lack of fires because there was nothing to burn, inedible shrubs, mulga, cypress pine and eucalypt seedlings began to colonise the open spaces. By the late **1930's** shrub regrowth had reached such proportions that some three year old ringbarked areas were so unusable, and so uneconomic to treat, that the usual follow-up treatment of suckering had to be abandoned – some of it still, 40 or 45 years later".

Gasteen's property was 'Thrushton'. It was acquired by the National Parks & Wildlife Service and set aside in the late 1980's to preserve '*the pristine mulga forest*'. The open woodland of World War 1 soldier settlement days had been replaced by dense mulga, as tellingly depicted in an aerial photo

published by Dr Rosemary Purdie⁹. This was the fate of all the mulga country east of the Warrego river. Purdie was a prominent Australian ecologist contracted to the Queensland Herbarium at the time of writing the article in which this photo appears. She goes on to assert that “as a result of land use the mulga region ecosystems can in no way be described as ‘pristine’ – that is, identical with their pre-Aboriginal or pre-European state”. Yet the government has got itself into a lather to preserve the present ‘remnant’ vegetation, not only in the mulga lands, but also elsewhere – so called ‘remnants’, but our forefathers would not recognize them!

Jump forward to 2005 and the elegant chemical sleuthing by Dr Evelyn Krull¹⁰. She and her colleagues utilized stable carbon isotope ratios to show that the gidgee communities on Mitchell grasslands in the Longreach district were of recent (post World War 2) origin, and followed the introduction of European style management practices. Indeed Frank Dean, the then owner of the property on which the research was carried out, informed everyone of this fact when the government appointed “State Trees Group” visited ‘Strathdarr’ in 1995. But at that time these same gidgee systems were classified by our Brisbane boffins as endangered remnants - supposedly less than 10% of the original vegetation remained!

Moorinya National Park is embedded within the Desert Uplands vegetation community and was set aside because its clay soils contain the most eastern expression of our Mitchell grasslands. However an aerial photo and ground study by Brigid McCallum from James Cook University showed that extensive changes in the area of Mitchell grassland had occurred at Moorinya¹¹. The woody plant cover of boree, gidgee and blackwood – all iconic native acacias – had increased by 32% over the 1951-1998 period.

Acacias invading tropical grasslands are easy to pick up since the change in vegetation structure is so stark, and soil chemical signatures can provide inarguable evidence for the switch in any event. But it is harder to be dogmatic about tree thickening in the eucalypt woodlands because trees have always been a component of these savanna communities, although at a much lower density than in today’s so called ‘remnants’¹². Still, long term vegetation monitoring at permanently positioned sites¹³, and aerial photo interpretation¹⁴ all endorse appreciable increases in woody cover, at least since World War 2.

These observations support the findings of Donald Franklin¹⁵ who utilized reliable Royal Australian Ornithological Union records, going back to the **1800’s**, to show that the marked decline in granivorous - grass seed eating - bird assemblages in Queensland’s Desert Uplands, preceded any land clearing activity. Meanwhile it is well known that increasing tree cover severely depresses understorey grass production¹⁶ – especially on dry, infertile sites. In other words – more trees, less grass, fewer granivorous birds.

So is the present Desert Upland vegetation true remnant, representative of the original or pre-European vegetation or not? Well we now have an answer to this question. Anna Sim¹⁷ and co-workers at the University of NSW and the Australian Nuclear Science and Technology Organization recently presented an analysis of sediments from Lake Dunn, which is in the centre of the Desert Uplands. Pollen records were used to identify vegetation change and in particular, the grass to tree ratio over the last **120** years. These results were compared to the historical record, rainfall data, and grain size distribution, using lead isotope dating to establish a depth-time relationship. It was found that a significant increase in Myrtaceae (eucalypt family) pollen occurred from the early 1950’s, reflecting a

change from continuous grass with scattered trees, to a near continuous scrub. These trends have been confirmed further to the north and east in the Burdekin catchment. Here the Co-operative Research Centre for Greenhouse Accounting selected 44 woodland sites at random, and again, by studying soil carbon isotope ratios, found that 60-70% of these sites show evidence of woody plant thickening over similar timeframes¹⁸.

I could detail many other examples of demonstrable vegetation thickening that have greatly altered the structure and composition of our vegetation - vegetation which nevertheless is now deviously described as 'remnant' by misguided bureaucrats and conservationists, both within and outside of government. So there are publications documenting the disappearing grassy balds of the Bunya mountains¹⁹; the replacement of wet sclerophyll forests in north Queensland by invading rainforest²⁰; the loss of grasslands in Cape York to invading *Melaleuca* trees²¹, and the dramatic increase in eucalypt cover²² in alluvial zones of the Victoria River, Northern Territory. The list goes on and on, and is backed up internationally by a very extensive scientific literature reporting similar phenomena, wherever hunter gatherer societies have been displaced by Europeans and their domestic livestock²³. And the universality of this response strongly points to altered fire regimes and livestock grazing as the prime agents of change²⁴, both in Australia and overseas, rather than higher rainfall patterns, as some conservationists now want to claim.

The variety of the evidence, its broad geographical spread, its consistent historical trend (dating from the 1800's), and its occurrence across most woody genera make the case for past and ongoing structural and compositional change in our grazed woodlands highly compelling. In other words, most of our supposed 'remnants', the alleged remaining representatives of the 'original' or pre-European²⁵ vegetation, now commonly classified as 'of concern' or 'not of concern' communities, differ greatly from the vegetation communities actually present when the early European explorers first traversed this land. And if the flora has changed so dramatically then I put it to you that the faunal composition of these 'remnants' also differs greatly from the pre-European fauna of these same landscapes.

In short, Queensland's VMA is not saving the so called original vegetation - it is mostly preserving vegetation artifacts that arose from post-aboriginal management. Artifacts that now restrict animal production on land assigned by government for the prime purpose of raising livestock. No ifs, no buts. Moreover, as Jim Gasteen and his contemporaries found in the 1930's and a comprehensive clearing strategies trial run over 15 years by the government's own staff in central Queensland proved – selective thinning of thickening vegetation (as proposed by government in response to this acknowledged problem, once the clearing bans are in place) is uneconomic²⁶. It simply does not pay unless commercial timber or fodder trees are involved – which sadly is only in a small minority of cases.

But there are other wider threats from unaddressed woodland thickening – which urban Queensland also cannot afford to ignore:

First, there is the threat to urban water supplies. Any landholder can tell you that to increase intake into farm dams you reduce the tree cover within the dam's catchment. You certainly would not let tree cover increase. The last WA State election drew nationwide attention to Perth's parlous water supplies. It is less well known that during the campaign it was pointed out that uncontrolled growth of vegetation over the past 25 years had reduced intake into Perth's aquifers – thus compounding the problem in an area of Australia where rainfall and fire incidence²⁷ have both knowingly decreased over the past 100 years.

Landholders on the Edwards Plateau, the watershed for San Antonio, Texas, USA are now being paid to clear trees off their land to enhance that city's water supplies²⁸. And in South Africa first year stream flow increases from clearing tall woody vegetation (including eucalypts) in the riparian zone of water courses, ranged from 9-44% per 10% of catchment cleared²⁹.

The second major worry I have with the clearing bans, when coupled with the reality that selective thinning does not pay, is that there will be a high likelihood of tree-shrub build-up in near urban areas. This must increase the chances of holocaust fires in this State, of the type previously confined to southern Australia. Of course an active controlled burning program should mitigate such risks. But government's inability to manage its huge National Park reserve and the dismal failure of NSW to significantly step up controlled burns in the wake of recent property damaging fires, doesn't fill one with confidence.

And this is the final theme of this talk. If the net result of Government legislation and policy is the effective cessation of tree clearing over more than 50 Million hectares of Queensland's woodlands then everyone (politician, bureaucrat, landholder and citizen) needs to quickly come to terms with how the aboriginal people managed our landscape for 40,000 years. I suggest that if you peruse the works of Stephen Pyne³⁰, Tim Flannery³¹ and that great anthropologist, Rhys Jones³², you will conclude, like me, that aborigines managed the landscape by burning it, in three ways – *frequently, regularly and often*. Or as a researcher in the Tropical Savannas CRC so neatly states it – "Aborigines lit fires any time it wasn't raining!"

Put simply, if you don't understand the basic evolutionary ecology of our plants you will never manage them successfully – despite the grandiose title and false promise of our much vaunted Vegetation Management Act. But even this well known association between our vegetation and fire has not stopped the government from now decreeing that anyone who wishes to open country up by using fire, will have to apply for a tree clearing permit, in addition to the customary burning permit!³³ Yet, as early as **1911** the distinguished geographer Karl Domin concluded that, in all parts of Queensland the open 'forests' (the true 'remnant' condition?) developed through the influence of aborigines, mostly by means of bush fires.³⁴ Likewise in **1955** M.R.Jacobs, the doyen of eucalypt ecologists correctly prophesized in his seminal book³⁵ written about the genus – "If fires were controlled the eucalypts would make a much closer forest in the far north of Australia".

Both Queensland and Commonwealth governments, through their offered "compensation packages", acknowledged that the VMA will have detrimental economic impacts on many landholders. But both governments refuse to recognize the **true scale** of the financial burden that the legislation places on both affected landholders and the wider community. Consequently the financial package to address the economic impacts of the Act is grossly inadequate.

In 2003 the Director General's office in my former Department asked me to contribute to a team assessing the cost of tree thickening to landholders in Queensland's grazed woodlands. We were specifically told not to look at the foregone benefits of clearing – which are well documented in both production and economic terms in any case. Our report (eventually released under FOI) showed the Net Present Value of unaddressed tree/shrub thickening alone, was a conservative \$293 Million to affected landholders, and about \$900 Million to the community at large. However, soon after this report

was passed on to NR&M and Premier's Departments, I was instructed to remove all evidence of the report from my files, and from the hard drive on my computer! [And I was **not** working for the Health Department!] Obviously our findings did not please someone high up in government – although our methodology was never challenged.

And now ABARE has just published a study which shows that “the current regulatory approach to preserving” - so called – “remnant native vegetation is imposing a large cost on the farm sector”. While “the cost of meeting native vegetation regulations is likely to be an important factor in determining the future competitiveness of Australia’s broadacre agricultural industries on world markets³⁶”. These studies endorse findings of the Productivity Commission Inquiry into the “Impacts of Native Vegetation and Biodiversity Regulations” released last year³⁷; and to which the Queensland government refused to make a submission, I am ashamed to say. What did Queensland want to hide? What was our government afraid of?

No one contests the truism that the “only sustainable agriculture is profitable agriculture”. But by virtually ensuring that many grazing enterprises will become uneconomic, as unaddressed tree thickening continues down the track, we are opening the door to unsustainable practices and severe damage to this State’s huge land and woodland resource base.

What a dumb legacy the so called ‘Smart State’ will pass on to its inheritors!

Endnotes/References to cited information sources:

¹ Blainey, G. (1982) Triumph of the Nomads. (Sun Books: Melbourne).

² Royal Commission (1901) Royal Commission to Inquire into the Conditions of Crown Tenants – Western Division of NSW. (Government Printer: Sydney).

³ Inter-Departmental Committee (1969) Report of the Inter-Departmental Committee on Scrub and Timber Growth in the Cobar-Byrock District and Other Areas of the Western Division of New South Wales. (Government Printer: Sydney).

⁴ Rolls, E.C. (1981) A Million Wild Acres. (Nelson: Melbourne).

⁵ Binnington, K. (1997) Australian Forest Profiles 6. White Cypress Pine. (National Forest Inventory – BRS: Canberra).

⁶ ABC Queensland Country Hour report – 20 September 2005.

⁷ Mitchell, T.L. (1848) Journal of an expedition into the interior of tropical Australia, in search of a route from Sydney to the Gulf of Carpentaria. (Longman, Brown, Green and Longmans: London).

⁸ Gasteen, W.J. (1986) Historical trends in the mulga lands of south west Queensland. In: “The Mulga Lands” (ed P.S. Sattler). (Royal Society of Queensland: Brisbane). pp. 72-78.

⁹ Purdie, R.W. (1986) Development of a National Park System for Queensland’s Mulga Region. In: “The Mulga Lands” (ed P.S. Sattler). (Royal Society of Queensland: Brisbane).pp. 122-127.

¹⁰ Krull, E.S., Skjemstad, J.O., Burrows, W.H., Bray, S.G., Wynn, J.G., Bol, R., Spouncer, L. and Harms, B. (2005) Recent vegetation changes in central Queensland, Australia: evidence from $\delta^{13}\text{C}$ and ^{14}C analyses of soil organic matter. *Geoderma* **126**: 241-259.

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- ¹¹ McCallum, B.S. (1999) An investigation of native tree incursion into native grassland at Moorinya National Park, North Queensland. B. App. Sc. Hons Thesis. James Cook university, Townsville.
- ¹² Domin, K. (1911) Queensland's plant associations: some problems of Queensland's botanogeography. *Proceedings Royal Society of Queensland* **23**: 63-67.
- ¹³ Burrows, W.H., Henry, B.K., Back, P.V., Hoffmann, M.B., Tait, L.J., Anderson, E.R., Menke, N., Danaher, T., Carter, J.O. and McKeon, G.M. (2002) Growth and carbon stock change in eucalypt woodlands in northeast Australia: ecological and greenhouse sink implications. *Global Change Biology* **8**: 769-784.
- ¹⁴ Fensham, R.J., Low Choy, S.J., Fairfax, R.J., Cavallaro, P.C. (2003). Modelling trends in woody vegetation structure in semi-arid Australia as determined from aerial photography. *Journal of Environmental Management* **68**: 421-436.
- ¹⁵ Franklin, D.C. (1999) Evidence of disarray amongst granivorous bird assemblages in the savannas of northern Australia, a region of sparse human settlement. *Biological Conservation* **90**: 53-68.
- ¹⁶ Burrows, W.H. (2002) Seeing the wood(land) for the trees – An individual perspective of Queensland woodland studies (1965-2005) *Tropical Grasslands* **36**: 202-217.
- ¹⁷ Sim, A., Heijnis, H. and Mooney, S. (2004) Use of the pollen record to investigate vegetation thickening in central Queensland over the past 120 years. Proceedings AQUA Conference (Tasmania).
- ¹⁸ Evelyn Krull, CSIRO Land & Water – pers. comm..
- ¹⁹ Fensham, R.J. and Fairfax, R.J. (1996) The disappearing grassy balds of the Bunya Mountains, south-eastern Queensland. *Australian Journal of Botany* **44**: 543-548.
- ²⁰ Harrington, G.N. and Sanderson, K.D. (1994) Recent contraction of wet sclerophyll forest in the wet tropics of Queensland due to invasion by rainforest. *Pacific Conservation Biology* **1**: 319-327.
- ²¹ Crowley, G.M. and Garnett, S.T. (1988) Vegetation change in the grasslands and grassy woodlands of east-central Cape York Peninsula, Australia. *Pacific Conservation Biology* **4**: 132-148.
- ²² Sharp, B.R. and Whittaker, R.J. (2003) The irreversible cattle-driven transformation of a seasonally flooded Australian savanna. *Journal of Biogeography* **30**: 783-802.
- ²³ <http://ag.arizona.edu/research/archer/research/biblio1.html> (accessed 15 March 2005 – follow the links).
- ²⁴ Scholes, R.J. and Archer, S.R. (1997) Tree-grass interactions in savannas. *Annual Review of Ecology and Systematics* **28**: 517-544.
- ²⁵ See p. 1/11 in Sattler, P.S. and Williams, R.J. (eds) (1999) The Conservation Status of Queensland's Bioregional Ecosystems. (Environment Protection Agency: Brisbane).
- ²⁶ Burrows, W.H. (2002) Seeing the wood(land) for the trees – An individual perspective of Queensland woodland studies (1965-2005) *Tropical Grasslands* **36**: 202-217.
- ²⁷ Ward *et al.* (2001) Grass-trees reveal contrasting fire regimes in eucalypt forest before and after European settlement of southwestern Australia. *Forest Ecology and Management* **150**: 327.

-
- ²⁸ Wilcox, B.P. and Kreuter, U.P. (2003) Woody plant:streamflow interactions as a basis for land management decisions in drylands. *Proceedings VIIIth International Rangelands Congress* pp. 989-996.
- ²⁹ Scott, D.F. (1999) Managing riparian vegetation to sustain streamflow: results of paired catchment experiments in South Africa. *Canadian Journal of Forest Research* **29**: 1149-1157.
- ³⁰ Pyne, S.J. (1991) *Burning Bush – A Fire History of Australia*. (Allen and Unwin: Sydney).
- ³¹ Flannery, T.F. (1994) *The future eaters – an ecological history of the Australasian lands and people*. (Reed: Melbourne).
- ³² Jones, R. (1969) Fire-stick farming. *Australian Natural History* **16**: 224-228.
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- ³³ Bob Shepherd, pers comm.- based on information provided to delegates to the Queensland Landcare Conference, Barcaldine, August 2005.
- ³⁴ Domin, K. (1911) Queensland's plant associations: some problems of Queensland's botanogeography. *Proceedings Royal Society of Queensland* **23**: 63-67.
- ³⁵ Jacobs, M.R. (1955) *Growth Habits of the Eucalypts* (Govt. Printer: Canberra).
- ³⁶ Davidson, A., Elliston, I., Kokic, P. and Lawson, K. (2005) Native vegetation: cost of preservation in Australia. *Australian Commodities* **12**(3): 543-548.
- ³⁷ Productivity Commission (2004) *Impacts of Native Vegetation and Biodiversity Regulations*. Report No. 29.

Acronyms

ABARE: Australian Bureau of Agricultural and Resource Economics
 ANSTO: Australian Nuclear Science and Technology Organisation
 CRC GA: Cooperative Research Centre for Greenhouse Accounting
 NPV: Net Present Value
 PC: Productivity Commission
 QNPWS: Queensland National Parks and Wildlife Service
 RAOU: Royal Australian Ornithological Union (now Bird Australia)
 VMA: Vegetation Management Act

Web access: <https://www.keepandshare.com/doc22/111984/burrows-pra-talk-sorting-fact-from-fiction-web-access-address-given-at-end-of-doc-pdf-332k?da=y> [last retrieved 4 Feb 2023]