

## Conference Proceedings – Speaker Transcript

### Fire management business in Australia's tropical savannas

**Adjunct Professor Jeremy Russell-Smith**

Charles Darwin University

[Link to slides](#)

Good morning, I would respectfully also like to acknowledge the traditional custodians of this place and all who look after and care for land and country. I would also like to pay my respects to the Nature Conservation Council for their excellent work over the years. I've had the privilege of coming to now three of your conferences and colleagues of mine have attended others and I think you succeed in ways that we would be very keen to try to emulate in other parts of the country, well done.

I work these days at an institute called the Darwin Centre for Bushfire Research and it's a partnership between a university, the Northern Territory Government and related Governments in Northern Australia, and the North Australian Indigenous Land and Sea Management Alliance. Our particular interest is not so much fire research, it's about looking at developing opportunities for sustainable livelihoods and as I am going to point out through this talk there's much scope in our part of the world for using environmental services, particularly carbon at the present time, for that. But into the future I think there is even more scope for these parts of the world, where maybe fire extent and frequency is not so great as in our landscape.

This is a map (slide 2) you've seen increasingly and it shows that the north is the most fire prone part of a very fire prone land. We've got to understand this is the scale of AVHRR imagery, 1.1 kilometre pixel sizes so you don't get all the small fires included, but it does get those 2002/03 fires which probably burnt around between 20,000 and 30,000 square kilometres. In the north we get about on average, depending on seasons, 350,000 to 450,000 kilometre square burns each year. Tasmania is 60,000 square kilometres. It gives you some idea of the problem that we have.

The savannas comprise about a quarter of the nation (slide 3). There's relatively few people who live there, there's about 700,000 people living in that landscape, mostly the great majority of those are in towns. Outside the towns Aboriginal people are the major part of the population and the land is ostensibly given over to much pastoral production. And we've got all the fine-grained cadastre of sheep farming in this part (central Queensland), remembering that that region is in terrible drought at the present time. And then the large sizes of properties across here (the remainder of the north).

And the issue is that in this arable land, the Barkly and the Gulf, there's a lot of cattle, there's not much fire-- if we were to go back to the preceding image, see there's not much fire in those parts of the landscape--but across the remainder fire eats the fuel.

This slide makes the simple point that much of the land in the north is indigenous land claimed through Native Title or Title under application (slide 4). So we have two tenure systems in place. But I think the big challenge for us in the north is developing sustainable outcomes for people and, really, finding opportunities particularly for Indigenous people who have much of the land but don't have much of the arable land and we need to find other ways to support that management.

This map (slide 5) illustrates the issue pretty nicely that we have in terms of fire. We've got a bit of burning in the early dry season around Darwin but much of the country is burnt under pretty severe late dry season conditions, obviously particularly in Cape York, and if we were to take the higher rainfall area across the top there that's burning on average over 50% per annum but most of that's in the late dry season. As you go further south it's about down to 30% of the landscape burnt.

These are the sort of fires that we would like to see (slide 6) and small patchy early dry season fires leading to much patchiness (slide 7) and pyrodiversity in the landscape--and I will emphasise pyrodiversity as opposed to the comments from yesterday because in contrast this has to be ecologically more benign than these sorts of situations which burn over very extensive areas each year.

This fire image is in Kakadu National Park (slide 8) and the point I'd like to make is that over 80% of fire extent in these landscapes is attributable to fires that are greater than 1,000 kilometres squared. That's a pretty staggering statistic and how can small animals let alone microbiota and the like survive frequent intense fires like this. So I think there is an issue of pyrodiversity at scale that needs to be addressed and our scales are totally out of kilter.

Over many years we've been looking for economic solutions to try to address this fire management problem and actually turn it into an opportunity, and since 2000 I and a whole raft of colleagues, scientists and Indigenous people, have been working particularly on this first of the greenhouse gas abatement methodologies (slide 10). The simple story is that if you could reduce the extent of more intense late dry season fires and get more benign early dry season fires you're going to substantially reduce the amount of emissions that come off it. I mean just the amount of fuel that's burnt for a start. And under the International accounting rules we can only account for methane and nitrous oxide. That delivers between 2 to 4% of Australia's national accounts, the greenhouse inventory accounts, each year. If we were allowed to account for CO<sub>2</sub> that would be of the order of about a third of the national inventories. Lesley yesterday indicated that there's the supposition that what gets burnt in one burning season gets fixed in the vegetation the next, and that's largely correct, but CO<sub>2</sub> is out there in the atmosphere for a damn long time before it's fixed again, and it is recognised as a weakness in the international rules but perhaps more importantly I think we totally underestimate the significance of emissions coming from these savannah fires accordingly.

So in about 2012 we had that emissions abatement methodology approved through the Australian Government and a whole lot of businesses are now set up to trade on that and I'll come back to that later. We've also been working on two other methodologies. Because if you change the fire regime to one that's more benign you are going to get more incorporation of organic matter in the living biomass, also in the non-living biomass, but particularly in the trees, and by the end of this year this particular methodology will be also available for land managers in the north. The sequestration into living biomass is a couple of years away, but I should point out that collectively the market from those types of

methodologies would substantially dwarf the income that can be generated from pastoralism in many parts of the north. We're talking about a totally new industry.

So just to remind you of the space we are working in, there's two isohyets on that map. One is for 1,000 millimetres which is the high rainfall savannahs, the other is the 600 millimetres, and just the southern extent of the methodologies to date. We are working on other ones into Central Australia but, although they are prospective, the amount of country that needs to be managed to get the abatement in sequestration return is very substantial and probably logistically prohibitive.

Much of this work came out of a program in Western Arnhem Land, called WALFA, that's actually the agreement with ConocoPhillips who entered into a 17 year contract arrangement with the traditional owners to deliver fire abatement over a 28,000 square kilometre area. That area also incorporates a very substantial bit of country in here which comprises northern Heath Lands, an endangered community, and the threatening process is obviously fire.

This program basically started at the behest of traditional owners in 1996, and I was privileged to be at that particular meeting with a very inspiring guy. He was a famous artist, didn't speak much English but was the main driver in trying to get fire management back onto country in Western Arnhem Land. That led to a whole series of meetings and processes that went onto planning to get the WALFA project up, and which by 2004 had started to enter into this arrangement with ConocoPhillips. It's basically about delivering a whole lot of on-ground burning but given there are effectively no tracks or roads through this landscape, throughout 28,000 square kilometres, much of it has to be delivered strategically using aerial mean, especially helicopters. This whole program is run by traditional owners.

The results have been stunning. On the right hand side of the map (slide 16) you see WALFA, that's the fire scars at the end of 2014. Note the small green patchy bits, that's all the stuff done in the early dry season. This is totally in accord with the traditional way of burning country. There are six traditional seasons. The one in the middle of the year which you would equate with winter is called wurrngeng, and the root is to burn, wurrk is to burn, it's the burning season. So, much of the country needs to be burnt at that time. It's totally coincident with the way ecologically country should be managed, the way white fellas in northern Australia should think about managing fire. WALFA has enabled a total transformation in the way fire management policy has developed.

By contrast, if you look Kakadu National Park, a World Heritage Property, big slabs of country there on its western boundary are burnt by these large extensive fires which are typical of the north. And Kakadu, as with the other major National Parks, are failing dismally. We think that firstly, the parks should engage more seriously with the traditional owners and in fact contract them to deliver more effective fire management programs using these carbon methodologies actually as the engine to drive it because, in their defence, those National Park organisations have very limited and dwindling resources.

I won't go into these graphs (slide 17) in much detail but this is just what's happened in WALFA over the period of 2006 to the present - the orange bars show the proportion of burning that was done in the late dry season relative to the early dry season. So you can see there was very much a late dry season, unmanaged regime. Come the start of the arrangement with ConocoPhillips, we start to see the whole fire regime turn around to one that's early dry season dominated and the resultant emissions from that 10 year baseline prior to the WALFA project have now reduced to a much level thereafter. I'm not going to go obviously into the calculation methodologies.

At the start of 2015 there were 34 registered fire and carbon projects across Northern Australia, all in that higher rainfall area, mostly on Aboriginal land but not confined to Aboriginal land. These projects are tenure blind, they can be undertaken in National Parks, Defence lands, you name it.

And the last slide (slide 19) is perhaps where I really wanted to get to in this talk. Currently we've been looking at the opportunities available through carbon management. I often say, and I repeat here, that we don't really give a stuff about carbon issues. Realistically I know that's a terrible thing to have to say but it's the means to the end for us to try to get better land management outcomes. Under the former Government we had the Carbon Farming Initiative and those fire projects prospered very well and delivered--for example in Arnhem Land sums of around \$10 million. We're talking large numbers, and now we have a new Government with a different sort of philosophy that the tax payer should pay for other people's pollution and it's going to be much more difficult to get similar successes under the ERF as it was under the CFI. For savannah burning projects you've got to enter into seven year contracts, they're not indexed for inflation, it's a pretty low price. It's a pretty mean world I think actually.

We would hope that in the future that market mechanisms should be revisited to make this a better playing field but we do understand that delivering carbon is not the be all and end all. What we're after is better environmental management and we see carbon simply as delivering an ecosystem service, and there are many other services which need to be delivered for biodiversity, water, cultural issues. We have over the last few years begun seriously to think about economic diversification, diversification for the pastoral industry in the north. We have to think about other systems of ecosystem services. I recent years we have formed a partnership involving the very largest pastoral companies in the land, the major regional indigenous groups, conservation groups, NGOs, looking at how we can actually start to set out developing a market based process looking at biodiversity benefits and the like.

Now you might think that's all pie in the sky. 15 years ago when we started to talk about carbon markets that was pie in the sky, so we actually feel that there is a great traction to pursue this line and it's got widespread stakeholder support across the north and I would suggest it's in that sort of vein that one should be trying to look at a diversification of benefits in your part of the world too.

### **Questions from audience**

**Q** – Having hung out at Wollongong University for quite a while my understanding is that the ratio of planned fire that you have to put into a landscape to mitigate wildfire in this part of the world means that carbon farming is not a goer down here. Can I just get your comment on that? I just want to be clear about that because it would be fantastic if we could do it here but I don't think we can.

**JRS** – Yes. Look I think there are other benefits that need to be considered and that particularly, that work by Ross Bradstock and others, was looking at the potential for emissions reduction and related issues to do with carbon sequestration into living biomass, and soils in your part of the world. I should have mentioned that in our part of the world there is no sequestration potential as far as we can measure in soils. The wetting and drying of the annual seasonal process means that soil organic matter inputs actually get readily oxidised and it just doesn't get fixed. In temperate climates there are more soil sequestration options. But I would say more broadly that you've got to look at a suite of environmental benefits not just carbon per se.

**Q** – A question for you Jeremy is can you comment briefly on what impacts the tall invasive pasture grasses in your part of the world are having on the whole indigenous carbon management program?

**JRS** - Fair question. Currently gamba grass is more confined to the region around Darwin but it's going to spread extensively and the bottom end of Kakadu National Park is already infested. Given that the Weeds of National Significance Program is no longer in existence there's no resources actually being put into any serious control and it has the potential to just transform negatively the north, forget indigenous lands it's just going to be all over the paddock. So I'm not quite sure what can be done.

**Q** – Jeremy - there's absolutely so many benefits that seem to come out of this carbon, you know, project from environmental, social, economic, but I've just read recently about some of the small mammal stuff, can you just comment briefly on that?

**JRS** - Well as I'm sure everybody in this room is aware that the collapse of the small mammal fauna which was very much ongoing in Central Australia is now moving into the north and there are a number of culprits identified as processes leading to that.

There are large parts of the Arnhem Land escarpment which have been burnt relatively benignly over recent decades and still the fauna has collapsed so it's not just simply a matter of big fires-- though I'm sure they are complicit over much of the northern landscape. There are cats obviously and predators, but maybe one thing that people haven't really looked at so closely is, in the combination of all these factors, how disease works. For example, there are large parts of the Arnhem Plateau now invaded by *Rattus rattus* and *Mus musculus*, and they, as invasive species, aren't necessarily benign in what they carry.