Conference Proceedings – Speaker Transcript

Reconciliation in the grasslands, re-introducing burning to Themeda grass headland EECs

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Link to slides

Thanks, I'd like to start by acknowledging the traditional owners of the land the Gadigal people and elders past and present. My presentation today is on reintroducing burning to *Themeda* grass headland endangered ecological communities. This is a bit of a visual representation of *Themeda* grass headlands in the south east (slide 2). One thing you'll notice is their proximity to the ocean. They tend to occur on more fertile soils, usually basalt derived or clay. If it's a sandy headland it tends to carry heath. *Themeda* Grassland on Sea Cliffs and Coastal Headlands EEC is the official title for the EEC. And they're geographically broad. They range from the north coast of New South Wales right to the south-east bio region. They're dominated by *Themeda*, that is Kangaroo grass with a high diversity of native herbs. It's generally accepted that they came into existence from indigenous burning practices.

There's a number of key threats associated with this EEC. Urban expansion used to be one. The remnants now occur mainly in National Park and council reserves. There are some privately owned stands. Agricultural use has resulted in loss of species richness. Vehicle impacts, foot traffic impacts, and weed invasion also cause a decline in condition. Perhaps the most compelling threat is shrub invasion. This can be either from exotic or native shrubs. Without active management these grasslands tend to shrub over quite quickly, extremely quickly with *Banksia integrifolia* evident in Goalen Head (slide 4). There you can see the early stages of shrub invasion. As it canopies over it lowers the integrity of the headland. This next slide demonstrates a grazed *Themeda* grass headland (slide 5). Essentially the more palatable species such as *Themeda* get consumed before the less palatable species *Poa poiformis*. There is nothing wrong with *Poa poiformis*, however you do get an unbalanced grassland.

Okay so why not slash it? In the past Eurobodalla shire council has slashed *Themeda* grass headlands up until 2010. There's a number of reasons why this is not ideal. First of all as you can see in this photograph on the left (slide 6), it creates windrows. This creates large patches of dead area that are susceptible to weed invasion, particularly *Asteraceae* species such as fleabane and flatweed. It damages the fragile herbaceous components of the grassland. It spreads weed throughout the grassland, because the slashers are often used for just general council purposes. It does not allow for natural seeding cycles and it favours mat forming exotic grasses such as kikuyu and couch over tufted native perennials such a *Themeda* and *Dichelacne crinita*. On the right hand that's *Paspalum dilatatum*, one of the weeds which is spread (slide 6).

To give you an idea about where these headlands are located, some of you may be familiar with the town Narooma which is about four and a half hours drive south from Sydney (slide 7). It's just north of

Narooma between the townships of Dalmeny and Kianga. Those polygons on the right represent the three headlands. They are rather small, probably about three hectares in total. The two northern ones have had two successive annual burns. The southern one has not yet been burnt, just for logistical reasons.

In making the decision to burn these there were a number of lines of evidence (slide 8). It's based on botanical evidence in the first instance. That is that there's a real diversity of species, there's a herbaceous component within this grassland which tells us that it's been there for a substantial period of time. Derived grasslands, that's grasslands which pop up when an area is cleared do not tend to carry that diversity. So we know from a botanical standpoint that they've been there for some time. These grasslands, because of their proximity to the coastline, are inherently tied to Indigenous culture. This can be seen in the extensive middens and burials throughout these grasslands. Also speaking with some of the elders of the area, we learnt that they were used for communication on the coastline. They were also used for rituals, camping and hunting as well. They're very closely tied to Culture and Greg Watts' 2006 paper on Aboriginal Burning Regimes alludes to a lot of this, as did Bill Gammage in his publication of 2011 which also alludes to a lot of the historical accounts.

This presents us with an opportunity to actually trial something different than slashing. So, the slashers were called off in 2010. We collected the baseline data and August burns were recommended just so the grassland would not remain open over the winter period leaving it susceptible to further weed invasion. Traditionally it should be an autumn burn and it would be great if we can roll it back to that, but we're dealing with constraints imposed by the presence of weeds.

The data collection was fairly standard. There was a 50 meter transect with one by one meter quadrats spaced along it at five meter intervals. Basically collecting abundance of species and coverage. This is a bit of a visual representation of the recovery (slides 12 to 18). Firstly, a couple of days after the first burn (slides 12), then a couple of weeks later (slides 13), and a couple of weeks after that (slides 14) where we're starting to see some regrowth. Then an image a couple of months after the burn (slides 15) where we're seeing it close over fairly quickly, which is what we intended. This is a year after the first burn (slide 16), we can see that it's completely covered and looks really healthy. I threw this one in for fun (slide 17), this is six months after the second burn to show that it bounces back and the aesthetic health is obvious. The *Themeda* is vibrant, it's invigorated, it looks like a healthy grassland (slide 18).

Perhaps some more compelling evidence is the botanical analysis. This was never intended to be a weed control mechanism. It was solely intended to be as a management tool, however we found exotic grasses reduced considerably. They were patchily quite abundant before the first burn. Because of the timing of the burn, it coincided with their natural seeding cycle and knocked out *Briza maxima*, quaking grass on the left, and *Vulpia* species ,rats tail fescue, on the right was completely knocked out (slide 20). We were really happy with that finding. The exotic perennial grasses were knocked back in biomass. They reduced to their woody rootstock and of course they re-sprout again, however it allows for targeted chemical control. There was an appearance of *Hemarthria uncinata*, that's native Matgrass. That was not evident in any of the quadrats beforehand. So that was a nice find. *Polygala japonica*, which is an indicator species for this grassland type, and a rather rare plant appeared in one of the quadrats as well post fire and we're really happy with that. One of the most important findings was that it killed tree and shrub seedlings. The main culprit is *Banksia integrifolia* pushing its way into the

grassland and with frequent burning this actually killed it and this was a finding we were looking for so we were really happy with that.

This project is still in the early days. We've had two successive burns. So far we're really happy with the results, we're finding it's all positive and we anticipate there to be more positive outcomes.

I'd like to quickly acknowledge Gregg Watts for his paper in helping setting this up. Our consultant botanist Jackie Miles who some of you may be familiar with. Envirotrust, the Aboriginal community for their input, particularly with signage and letting us know what those areas were used for culturally, and the Rural Fire Service for conducting the burns. Thank you.

Questions from the audience

Q – Tom, can you just say a bit more about the sort of Banksia that's invading, is that coming in from outside or is it existing seed in the soil? And can you comment on how you know what the past was there? Like was there some Banksia there or has it been coming in from birds or…?

TD - It's immediately adjacent to a lot of Banksia type forests. There's a lot of Swamp Oak and Banksia surrounding these headlands. So it's a progressive line which varies back and forth over time. You see it sporadically coming into the headlands and that's how it travels in.

Q - What was the approval process, was it a hazard reduction burn or an ecological burn and is there any interest from Bega Shire to sort of do it on their land at all if you know?

TD - There has been interest state-wide in this project, first of all to answer that part of your question, from as far as Coffs Harbour and Ballina. Certainly Bega, Jackie Miles is involved down there and she's been pushing for that down there also. I can't remember the first part of the question I'm sorry.

In terms of approvals it was an ecological burn, yes. It was conducted by the Rural Fire Service, essentially a training exercise for them. So in this case it was quite feasible to actually do that and it's cost effective.

Q - Can you say something more about the approvals process related to that ecological burning and the one year time frame between burns.

TD - Yeah sure. I'm aware that that might be scrutinised, the frequency in which it's prescribed. Because grasslands, generally there's a five to ten year prescription for burning. That applies to southern tablelands style grasslands and inland grasslands. But these are maritime grasslands. They're a little bit different. To keep those shrubs off the grassland it needs a much more frequent fire. If we waited five years, we start losing headlands to shrubs, so essentially the indigenous burning regime was annual.

Q - Tom a question about the extent of these in the past. For headlands along the New South Wales coast, how common was *Themeda*? I look at old paintings of North Head and I think I see Themeda.

TD - That's correct and from all historical accounts the coastline, they were very extensive and very common and obviously they've become less common as time goes on due to all those threats and constraints.