



Bushfire Regeneration Submission (New South Wales)

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Mike Musgrave

MD&E Pty Limited

[REDACTED]

[REDACTED]

[REDACTED]

Mr Charles Leonard

[REDACTED]

[REDACTED]

[REDACTED]

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1. OVERVIEW of BUSHFIRE REGENERATION

The recent 2019/2020 summer bushfires burnt out almost 8,000,000 hectares of the states roughly 80,114,000 hectares of which some 21,000,000 hectares is classed as forested. (See definition below).

In New South Wales (NSW) National Parks cover an area of 5,045,422 hectares and terrestrial Protected Areas 6,641,256 hectares. Of these two areas, approximately 2,119,000 hectares of National Parks and approximately 3,290,000 hectares of Protected Areas were consumed by intense 'hot' fire giving a total of approximately 5,400,000 hectares; about a quarter of the States forested area.

The majority of native Australian bush flora is made up of active pyrophytes, that is bush fire dependant vegetation that rely on fire to propagate their seeds for regeneration. Our native trees and some large shrubs generally feature sclerophyll trunks that is, outwardly hardened.

The majority of native Australian terrestrial fauna have the ability to survive ordinary bushfires evolving to thrive on natural Australian bush vegetation and ground and trunk flora based wildlife. However, in the case of the most recent intense, fast moving and unpredictable summer bushfires a great many native fauna perished. This was a direct result of unacceptable levels of dry, very dry ground fuel that had been allowed to accumulate for many years. It follows that if we are able to regenerate our native flora we will regenerate our native fauna back to sustainable levels.

The definition of forest used by Australia's National Forest Inventory is:

An area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding 2 metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20 per cent. This includes Australia's diverse native forests and plantations, regardless of age. It is also sufficiently broad to encompass areas of trees that are sometimes described as woodlands.

1. REGENERATION: DEFINING the CHOICES (Main Considerations)

The main focus of this section is to define the post 2019/2020 east coast bushfire bush regeneration.

CHOICE 1: Allowing the vegetation to re-generate naturally:

If we simply let the bush regrow naturally, we can expect many changes to the previous ecosystems as different species of plants and animals progress through a constantly changing landscape from a shrub under-layer to a scattered canopy to dense scrub to forests of different types. This seems to be repeating what has been done since the Aborigines (Indigenous) were removed from custodianship of their country.

The native indigenous peoples used natural regeneration in conjunction with ‘cool’ fires every three to five years when wind conditions were favourable in relation to their camp localè.

A process of non-intervention may be the cheapest option and lead to an eventually stable system, generally under a stable set of weather conditions, without ‘cool’ fires; but since Australia's weather patterns are predicated on the El Nino Southern Oscillation and the Indian Ocean Dipole, we cannot rely on a stable weather system. Therefore predicting the regeneration, n timeline and make-up is equally an unknown.

CHOICE 2: Managing the vegetation re-growth:

If we decide to manage the vegetation re-growth with a mix of Aboriginal (Indigenous) Cultural practices, modern science, experience and logistics we may be able to establish a viable set of practices that allow habitat and species survival and significantly reduce future infrastructure damage and human casualties.

This self-management strategy is expensive and would require a large ground-based workforce of indigenous and other rangers, tradies, technicians, scientists to analyse data and formulate possible strategies as well as people skilled in logistics and forward planning. To support the above would require native plant propagation nurseries, transport and supply facilities. (*SEE SECTION 6, REGENERATION: ECONOMETRIC COMPARISONS*).

One suggested table of field activities is as follows:

- ✚ Defining a ground grid pattern for the spatial planting of native trees and shrubs within those grids,
- ✚ Identifying and recommending the fertilizing additives to poorly nourished soil, damaged by the intense heat of the recent bushfires,
- ✚ Setting out a sustainable grid pattern of planting to riparian embankments,
- ✚ The use of aerial laser 3D surveying to identify areas where wide access tracks may be constructed for use in regeneration activities access and firefighting.

An economic spin-off from managing the bushfire re-growth is that it would provide employment opportunities at many levels from field staff to education and management personnel (hopefully without creating a new ministry of people monitoring progress). This would help lower the unemployment statistics for regional areas as well. A social spin-off would be a rise in regional tourism and the self-esteem of country town populations, some of whom are currently dependent on self-deprecating welfare support. This social benefit may also hopefully lead to greater community engagement and a reduction in petty and minor crimes.

The downside to the self-management option is the dollar cost (see above), and the time necessary to implement it. An objective perspective is that we do, have a breathing space of about 6 months before we will need a large injection of personnel; this period could be covered by our existing

NPWS people with the objective that they provide information on skills gaps during this half year hiatus.

Managing the bush regeneration would require a re-think of the land experience and qualifications of staff currently employed within the office of Planning and Environment. Young tertiary qualified staff should expect to be 'articled' to undertake a minimum of three years bush and land practices prior to becoming involved in self-managing field regeneration.

Important elements for training in the techniques of managing the landscape mosaic include: the typical density per cubic metre of Penicillium bacteria, Formicidae, Annelids, phylum Nematoda, phyla Platyhelminths, Mycophagy and arachnids et al of the terrain in question. An accurate measure of the density of the timber in the region and the calomel half-cell reading of the dry/moist/saturated detritus and rhagolith' would also be required.

It is important to note that planned and managed revegetated landscape fabric is a visual experience for tourists and emigrants who wish to move and live in a safe regional environment resplendent with healthy native vegetation.

CHOICE 3: Reducing bushfire intensity:

A legislated policy in the reduction in forest floor fuel loads is required for either of Choices 1 or 2 , above. That is they are contingent on the removal of dry ground level forest litter and detritus. This can effectively be done by two methods (a) in remote non-accessible areas; a 'cool' fire, dependent on wind conditions, once every three to five years and (b) in vehicular accessible areas manual and machine clearing and removal from site together with a 'cool' fire every five years, again wind condition dependent.

Periodic ‘cool fires’ are beneficial to our landscape soils, flora and fauna, as stated above. A regime where this governance is legislated can be used as a touchstone for all future Government Treasury expenditure on bush fire control as in the long term this policy will prove economically prudent.

CHOICE 4: To continue fighting intense multiple bushfires:

This policy would appear to most taxpayers as being reckless given the recent losses in human life, valuable flora, fauna, property losses, insurance losses, stock losses and resultant regional econometric losses due to the recent bush fires.

Australians must accept the fact that if they wish to live and work in forested areas, they need to provide safe distances from native flora to their domicile or business buildings.

2. REGENERATION: RESOURCES OPTIONS MIX

- (a) Use the existing government field employees from the departments of Planning and Environment and National Parks and Wildlife Services.

Given recent bushfire events, this option does not appear to be viable as the recent fires were apparently not in the spectrum of an event for which planning had occurred. Moreover, the two departments (P&E and NPWS) are under-resourced to undertake mass regeneration of some 8,000,000 hectares of badly burnt landscape.

Given that the current policy of undertaking back-burning operations is to just 5 to 10% of native bushland per annum (based on a doubtful algorithm), it would appear that current government field staffing levels are geared to this policy and would be inadequate for bush regeneration projects.

- (b) Use a mix of regional indigenous personnel together with scientifically trained flora and fauna personnel.

An estimate of personnel required over the next three years for managed bush regeneration is given in the following table:

Human Resources	Staffing Numbers Required over Three Years	Vehicles and Machinery Required
Indigenous and other Field Rangers	3,000	4WD's, Single axle 7t trucks, Bob Cats, Excavators fitted with 'grab' heist, All Terrain Cranes, Scissor Lifts, Soil additive elements machine spreaders
Field Data technicians	100	4WD's

Human Resources	Staffing Numbers Required over Three Years	Vehicles and Machinery Required
Flora and Fauna Scientists	50	Cars
Nursery men and Arborists	200	4WD's, Bogie axle 12t trucks, Fork Lifts, chain saws and climbing equipment
Field Supervisors	100	4WD's, Demountables
Transport Managers & Drivers	100	4WD's, Demountables
Dedicated Regional Civil construction crews	250	Various: Including excavators, graders, small dozers, water carts, wheeled drum compactors and backhoes
Office Managers & Administrative Staff	100	Cars
Total	3,900	

(c) In addition there is a requirement to establish dedicated nurseries to supply native trees, shrubs and plants for planting and or modify existing government nurseries.

(d) The analysis of the soils in existing severely burnt areas and the soil improvements required will be a tactical field decision between the regeneration scientists together with the field supervisors and rangers. Existing testing laboratories would be utilised.

3. FIRE INSTENSITY PREVENTION

Bushfire intensities are exacerbated by long term ground fuel load build up in forested areas together with extended periods of dry weather.

To help abate this problem the following solutions can be followed:

The construction of maintained access tracks or roads with a minimum clearance either side of the road of 10 metres.

The construction of maintained fire breaks with a minimum tree and shrub clearance either side of the fire break centre line of 50 metres.

The regular clearing of denuded fuel loads including tree, shrub and ground covers by the use of a combination of manual labour and dedicated machinery.

4. FIRE FIGHTING IMPROVEMENTS - COMMAND DEVOLVEMENT

In a multiple fire crisis it is impossible for logistical command algorithms to forecast as to which location/s resources are to be sent, given unpredictable local wind conditions, variable temperatures and variable humidity within any particular area.

Local wind directional changes in fire affected areas and the rate of change in wind direction and temperature are vectors best left to experienced local fire personnel on the ground in the affected area.

This demands that if there are any more than ten major bushfires of more than 500 hectares burning for less than four hours state-wide then the local group captain should have overriding logistical and back-up command of the land and aerial fire-fighting resources he requires.

This is because the local group captain knows the location of access roads/tracks, the best location of accessible existing water reserves and which properties may be in danger.

5. REGENERATION: INTER-GOVERNMENTAL AGENCY CO-OPERATION

National Parks and Reserves Bushfire ravaged areas to be revegetated plus the human and mechanical resources required for the field undertakings would be required to come under one department to have overall command.

This would be the most effective strategy to muster the required supply chain of laser survey, fresh plants, chemicals, vehicles, field staff, data collation, mapping and works programmes.

6. REGENERATION: ECONOMETRIC COMPARISONS

Choice Option	Estimated \$ Costs	Estimated \$ Recouped Revenues
Natural revegetation	\$0.00	\$0.00
Planned revegetation	\$15bn over 3 to 10 years	*\$1 to \$2bn each year
Reducing bushfire intensity	\$5bn over 3 to 10 years	\$0.00
Continue fighting intense multiple bushfires		\$2.5 to 3bn every 3 to 5 years

*The estimated revenues in the table above relate to the revenues generated by the increased volume of tourist traffic to planned revegetated regional areas, the increase in property sales taxes due to an increase in people emigrating to planned revegetated regional areas, the increase in payroll taxes as businesses expand in the improved regional areas.

7. COMMAND DEVOLVEMENT

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8. ANNEXURES:

(i) Treasury Budgeting: Regeneration and firefighting equipment

If it is the intention of the New South Wales Government to have our natural environment as a high priority then NSW State Treasury should allocate funding in accordance with stated Government policy.

If this prioritisation should involve the purchase of equipment and the employment of human resources to carry out the bush regeneration as laid out above, then a programmed list of budgeted funds dispersal needs to be circulated widely to all affected parties.

This suggestion is made to be considered with applications for provision of funding for the newer or improved firefighting landside, airside, aquatic and structures resources that the Rural Fire Service has already submitted.

(ii) Commentary: Uninterpretable emergency communications

To help prevent loss of life, property and stock during multiple uncontrolled regional bushfires it is recommended that an application be made to the Commonwealth Department of Communications and the Arts (DoCA) in conjunction with the Australian Communications and Media Authority (ACMA) for a dedicated chain of an uninterruptible Satellite, VHF and HF communication system.

Once established this system would be for the exclusive use between the following state agencies during bushfires emergencies: The Police Services, the various suburban Fire Services, the various Rural Fire Services, the various State Emergency Services and the various Ambulance services.

The implementation of the dedicated communications system would simplify centralised and regional control between state's headquarters, local regional fire command posts and aerial appliances. Costs would be shared amongst the affected states.

(iii) Commentary: The role of insurance companies

Fire and General Insurance Companies providing insurance cover for fire and storm damage generally do not carry out inspections of private dwellings prior to contracting with the insuring proponent on the buildings risk. This is regardless of whether or not the insured has and maintains cleared land for a thirty to fifty metre perimeter or not. The same lack of inspection applies to timber fences and whether ground cover is kept cleared.

It is of little benefit for the public for the Insurance Companies to simply classify properties as being in a particular fire intensity 'Zone'. This discriminates between responsible property owners who keep a practical cleared area from their homes and those property owners who do not.

The State Government is in the 'box seat' to use their 'moral suasion' to encourage Fire and General Insurance companies to undertake individual house inspections prior to policy issuance in bushfire prone areas to mitigate their risk. The alternative is for the Government to introduce practical legislation to require insurance inspections of properties and for the insurance inspectors to suggest fire safety improvements to the property prior to underwriting the risk.

There is another reason for pre-insurance inspections to be undertaken. The additional risk taken by the Reinsurance Companies who agree to underwrite a proportion of the risk for properties in fire affected zones. With proper inspections and the sage advice given by the insurance inspectors to property owners re-insurance costs for these properties would reduce.

Suggested NSW Legislated policies:

- ✚ A legislated policy of having a standard requirement of a 25 to 30 metre perimeter clearance of all vegetation around homes in remote areas and a three metre clearance around fences,
- ✚ A legislated policy of having a standard requirement of a 50 metre perimeter clearance of all vegetation around small businesses, service stations et al in regional towns areas,
- ✚ A legislated policy of having a standard requirement that no polymer (plastic etc) based products are to be used external to regional structures for gas connection hoses, downpipes, sullage vent pipes, electrical or communications conduits,
- ✚ A legislated policy of having a standard requirement for cavity brick, pre-cast concrete or stone block buildings in bush fire prone areas as an alternative to any timber external clad buildings. If timber external cladding is utilised or is extant on existing heritage buildings then a higher insurance premium to be paid,
- ✚ A legislated policy of having a standard requirement that where any structural timber framing is utilised in the construction of buildings in bush fire areas then steel nails, rather than wire nails be used,
- ✚ A legislated policy of having a standard requirement that metal wall and roof framing (0.58mm minimum thickness) is preferred to timber framing in fire affected areas. If timber framing is utilised rather than metal then a higher insurance premium to be paid,
- ✚ A legislated policy of having a standard requirement that all window frames in construction of any building in bush fire prone areas that the window frames be scribed into and within the external brick, stone or concrete walls of that building,
- ✚ A legislated policy of having a standard requirement that roof skylights manufactured with Polyurethane or other similar material be banned. Toughened glass skylights with steel frames placed within the roof cladding are to be used in lieu of poly products,

- ✚ A legislated policy of having a standard requirement that concrete or slate roof tiles be used as roofing material in lieu of metal roof cladding.

(iv) Authors, short Biographies

Mr Charles Leonard

Charles is now retired and has qualifications in horticulture. He taught in the horticultural industry for approximately forty five years. His current interest are the interactions between flora, fauna, soils and geology and has studied the native Australian flora and fauna extensively including the diversity of plant communities. He also has an abiding interest in the environment and ecosystems.

Charles resided in the Blue Mountains area of Linden for more than twenty five years.

Charles spent over twenty years serving as a volunteer with the Linden RFB where he experienced bush fires and helped in the conduct of backburn operations. He has seen the effects of uncontrolled flora regeneration in fire affected areas.

Mr Mike Musgrave

Mike is a retired consulting engineer specialising in the fields of both civil and structural engineering.

Mike spent five years in the insurance industry, specialising in auditing and re-insurance. He then underwent a building cadetship for six years and moved into Project Management with his own company. With the advent of the construction of the Sydney's Darling Harbour Project in early 1799 Mike was engaged in the civil and structural aspects of the project and the finishing

works plus other related Public Works projects for the following four years before establishing his own consulting practice.

Since that time Mike was contracted to work on major projects including Sydney's Anzac Bridge, the first TransUrban (North) project in Melbourne, Number 6 Blast Furnace in Port Kembla, the Chatswood to Epping Rail project, Sydney's Second Airport and Abbot Point in Queensland. He worked with most major civil engineering companies, The New South Wales State Government and the Federal Department of Transport over that time prior to his retirement in 2013.