

SUBMISSION
OWENS-O’KANE INQUIRY INTO 2019-20 BUSHFIRE EVENTS
A CASE STUDY

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Background: Retired Agricultural Scientist now living on the far south coast region of NSW with extensive and science-based experience in all aspects of land management including bush fire behaviour and government procedures and administration.

Local Support Group: The content and issues canvassed in this submission are supported by a majority of people living within the designated area. It is derived from numerous discussions with local people and represents a general consensus about the concerns expressed.

Scope of the Submission: The reference area nominated is within the Tura Beach precinct of the Bega Valley Shire, represented by High Crescent, Nolan Drive, Casuarina Place and immediate surrounds. This area houses more than 100 residents in 51 dwellings on 1 acre and 2 acre blocks that encompasses the Tura Beach Flora Reserve. The management (or lack thereof) of this reserve is of extreme concern to the majority of residents and ratepayers, including residents of the nearby Retirement Village.

The area is classified as residential in the Bega Valley Bush Fire Risk Management Plan (endorsed by Council September 2019) although it may be classified as urban/rural interface by other institutions. The area is serviced with well-maintained hydrant outlets that draw on a good town water supply.

Principle Objective of the Submission: Residents within the greater Pambula/Merimbula/Tura Beach area were fortunate that during the 2019—20 bushfire period they did not suffer property damage or loss of life as wildfires came within 20 km. This was seen more as good luck rather than sound long-term planning and prevention strategies. Most private property owners in the area have bushfire management plans, reduce excess fuel on their land and work cooperatively with their neighbours to reduce the risk of fire.

Therefore, our concern relates to on-going PREVENTION strategies rather than rehabilitation and rebuilding as is the situation for those in the Shire who have faced major loss and personal trauma. The land with the highest fuel load and hence risk is generally state forest, national parks, reserves, aboriginal tilted lands and other public lands.

The climatic conditions that prevailed this summer, combined with extremely high fuel loads, placed us in a high-risk category particularly with Nolan Drive being the only exit should a fire occur in the Reserve.

The structure of this submission follows the order of the Terms of Reference as the issues relate to our area.

Terms of Reference 1 Weather, climate change, fuel loads

It was quite evident from Autumn 2019 that the region was facing a severe fire danger period as winter rainfall had been well below average, the adjacent forest areas were carrying high fuel loads, with the material having very low moisture content and high pressure weather patterns were producing high risk winds from the west and north west. These weather systems were the direct result of a positive Indian Ocean Dipole (IOD) coupled with an established el Nino event. Despite the SOI weakening as 2019 progressed, all meteorological indicators showed that there was little likelihood of change to a less extreme weather pattern. These indicators stated very clearly that we were likely to experience a severe bushfire event. There was no indication from the Bega Valley Shire Council (BVSC) that they acknowledged the developing situation particular as the disastrous Tathra fire event only occurred in March 2018.

Climate change is only part of the problem. The small recorded increase in ocean temperatures as a results of climate change is likely to have made a small contribution to temperature differentials driving IOD and possibly the SOI. High ocean temperatures in the Coral Sea are a pre-requisite for tropical cyclones to develop and this period is marked by a normal to below normal period for cyclones impacting on the east coast of Australia.

High fuel loads in SE NSW and NE Victoria were the major contributors to this devastating bushfire event. As an agricultural scientist, I have used simple quadrant-cut methodologies to measure vegetative yields, on the basis that 100gm of fuel per m² is 1T of fuel per Ha., with fuel load being expressed in tonnes per Ha. Over several years I have taken such measurements on land close to and within the nominated area in Tura Beach, with fuel loads in excess of 20T/Ha being common. (see photographic attachment).

It should be noted that RFS has recommended that fuel loads in sclerophyll forests of SE Australia should not exceed 5-7T /Ha.

Terms of Reference 2 Preparation and Planning by our community, the BVSC and the NSW Government

In August 2003 four property owners in High Crescent wrote a joint letter to the BVSC expressing concern about the fuel load in the Tura Beach Flora Reserve. The Council replied with a promise, in association with RFS, to commence a hazard reduction program. Despite the best of attentions, this program has largely failed and current fuel loads are now greater than 20T/ha in parts of the Reserve.

In 2008, several concerned property owners made application to Fire & Rescue NSW (NSWFR) to establish 2 Community Fire Units (CFU) covering High Crescent, Nolan Drive and Casuarina Drive. In their assessment, NSWFR classified our area as a high-risk location, confirming our valid concerns. As a result, NSWFR provided training and equipment for the units but these units are controlled by NSWFR and can only be mobilized by them. It is evident from the above that this community is very fire conscious and have organized themselves to be pro-active in local planning and preparation. However, there have been real difficulties as the BVSC has not supported our community's endeavours to reduce the risk of un-controlled fires nearby.

These concerns are demonstrated by the following examples:

1. **Management of the Tura Beach Flora Reserve.** A Section 355 Committee of the Local Government Act 1993 has been established to assist Council with the operation and maintenance of the Reserve. The purpose of a 355 Committee is to advise BVSC on the views, needs and interests of the community. Committee members should have experience or expertise in the area defined - in this case is vegetation and land management, local fauna, botany and plant science. Residents in the nominated area have expressed concerns that the Committee has not vigorously lobbied Council to make funds available and as a consequence fuel-reduction strategies have not been given the priority required. Similarly, BVSC elected Councillors and senior staff rarely if ever inspect the Reserve.

This is illustrated in 2009 when the Committee met with a representative of NSWFR ([REDACTED]) and negotiated a fuel reduction sectional burn plan whereas it was the RFS that had the charter for such burns, not NSWFR. This confusion of responsibility between the two State fire agencies is referred to below as having an adverse effect on the two CFUs. Local community members joined these units to assist as volunteers to reduce fuel and implement fire management plans. It begs the question as to why train and accept resources from NSWFR and then not permit members to mobilised and protect homes and property?

This submission supports the continuation of the Flora Reserve as it provides habitat for fauna and native plant species of this coastal environment and specifically the endangered *Astrotricha wallagaraugh*. Attempts to encourage growth of this species is handicapped by a dominant dense understory of Bracken Fern, Acacias and Casuarinas. If these aggressive species were managed and controlled the Reserve could be a more attractive feature of Tura Beach and encourage more visitation. There is a strong case to disband the Committee and for suitably trained BVSC staff to directly manage the Reserve.

2. **BVSC Bush Fire Risk Management Plan.** Under the Rural Fires Act 1997 each local government body in an area subject to the risk of bush fires must prepare such a plan. The current plan for the BVSC was endorsed by Council on 17 February 2019.

The aim of the Plan is *to minimise the risk of adverse impact of bush fires on life, property and the environment* while the objectives of the Plan are to:

- Reduce the number of human induced ignitions;
- Manage fuel to reduce the rate of spread of fire;
- Reduce the community's vulnerability to fire by improving preparedness;
- Contain fire with a potential to cause damage to life, property and the environment.

The BVSC Plan is superficial in that it only refers to the RFS and does not define the role of NSWFR in the Shire. Nor does it address the frustration that exists in our community over the demarcation issues between the two state fire-fighting agencies. In fact, the Government analysis of the 2018 Tathra fire emergency stated that there is "palpable animosity between NSW firefighting agencies". This is unacceptable and carries over into operational aspects of the two CFUs in that RFS will not work with the CFUs on either joint training, prescribed burning or actual emergencies.

Despite that, the CFUs have been instrumental in identifying “aged and at risk” citizens when recording static water supply storages, recording gas and combustible materials and assisting property owners with individual fire management plans, particularly the issue of whether to stay or leave when threatened.

The Plan does not consider mechanical means of removing fuel as distinct to in-situ burning, using the biomass in Bio-Char, gasification plants... This matter is addressed in Section 5 of the Submission.

Chapter 4 of the Plan concerns Performance Monitoring and Review but gives no performance indicators or how local communities measure and assess if the Plan is meeting its objectives! This Chapter does state that the Plan be reviewed every five years (2024?) or when necessary following a major fire event. That is required NOW!

A small number of residents in the nominated area and others not living in this area have stated that we must accept a higher fire risk to live in close proximity to the Reserve and adjacent bush lands. This is rejected. It must be noted that BVSC Bush Fire Risk Management Plan includes an asset register (Asset ID 30) that classifies all of Tura Beach as Residential. Also Bushfires CRC, when analysing past major fires look at the urban/ rural interface, a definition that perfectly fits the nominated area. Our rejection of an “in the bush” land area definition is further supported by the fact that the area is serviced by the town reticulated water system, something that does occur in true rural or bush locations.

When considering how the Shire has met the objectives of the Bush Fire Risk Management Plan it is difficult to state anything other than FAILURE on nearly every issue, particularly as the Plan was written and adopted only 18 months AFTER the Tathra fire of 18 March 2018 and the released Keetly Report and recommendations on this fire event.

There is no point in entering a blame game, but it is essential that the BVSC and all community stakeholders learn from this event and implement strategies that reduce future risk, protect lives and assets and minimise the severe economic impact on our local economy.

Terms of Reference 3 Response to fires, public warnings, equipment and communications

A general observation is that once a fire had ignited, the RFS information and mapping system performed very well in issuing warnings and the projected spread of the fires. This communication system was well supported by the Bega office of the ABC, the BVSC web page and associated Facebook Service so the community on the Far South Coast had every opportunity to keep abreast of the rapidly changing situation. There could have been an issue with elderly people who do not have internet access.

The RFS App “Fires near me” is particularly useful as it gives distance to fires, is updated frequently and has accompanying text information.

This submission does not comment on the adequacy of equipment but notes media statements that there has been some difficulty with radio frequencies used by RFS and that some RFS brigades have older fire engines that offer reduced protection to RFS members. Section 5 and 8 of the submission refer to aerial assets.

Terms of Reference 4 Other matters and recommendations

No additional comment

Term of Reference 5 Planning for future bush fire threats

Changes to the climate in SE Australia will have a profound effect on all aspects of land management and associated fire management. It is evident that we must draw more on innovative technological methods to first plan and measure the suitability and application of such technologies.

Research and Development Possibilities

The 2019-20 bushfire emergency highlights the need for an adequate level of funding to be made available for the Bushfire and Natural Hazard CRC. This body coordinates and funds R & D, bringing together State and Federal agencies, universities, CSIRO and others. Research and detailed analysis of past major fire events has provided invaluable information on how to best plan for the future and integrate fire management plans into the management of all land assets, particularly national parks and state forests. Much of this work has been noted by the author of this Submission and has influenced suggestions and recommendations made.

Unfortunately, many of the methodologies and research into bushfire behaviour from Bushfires CRC have been ignored by state and local governments, this being evident in the current crisis.

Because new research objectives and new technologies are so wide ranging, this Submission simply aims to list a few that have direct application for the far south coast of NSW and warrant further research, costing and investigation. Some research priority issues are recommended below:

1. Measuring Fuel Loads

The simple fire triangle identifies fuel, oxygen and heat or ignition as the variables that determine the intensity and duration of a fire. Heat or ignition is set by ember drop, arson, fallen power lines and other obvious sources. The oxygen level is determined by wind velocity and how the fuel is arranged with upright well aerated fuel burning more readily than prostrate compacted fuel. Fuel load in the current crisis is the largest single variable and clearly warrants research into how it can be accurately measured over large areas so that priority to reduce the load can be determined.

A technology to do this is available as it is already applied in the Savannah Burning Methodology of the Carbon Farming Initiative. Here vegetation maps are prepared on a regular basis using satellite imagery and through a series of ground truthing algorithms, fuel loads are calculated to determine CO₂ sequestered. A simplified version of this procedure would allow large areas of state forest, national park, private lands and other land assets to be assessed prior to each fire season. Fuel load data should then be made available and broadcast at critical times of the year as occurs with meteorological information. RFS is using a similar mapping method to map an active fire ground but the lead role of Geoscience Australia must continue and be adequately funded for all state agencies.

2. Using Excessive Biomass.

The most widely used means of reducing fuel load is *in situ* burning of grasses, regrowth, fallen timber and the understory of forests. Although this is expensive in that it requires the presence of RFS or NSWFR resources, it does not manage CO₂ and other greenhouse gas combustion products, the timing of the burn is controlled by prevailing climatic conditions and it can cause nuisance in adjacent areas.

As stated above, we must seek an alternative to actively manage these forests using mechanical means to remove fallen timber, branches and other biomass products. There are a number of Australian and overseas examples that should be considered, including use of Bagasse in the Queensland sugar industry, the burning of saw-mill waste and the UK example of pelletising plantation timber as a biomass resource.

South East NSW, including the Bega Valley is an obvious location to undertake feasibility studies and detailed costings on the following:

- **Incineration.** The biomass is burnt with steam generation for electricity turbines, a common use in the sugar industry and timber milling with the electricity fed into the grid.
- **Bio-Char.** A form of pyrolysis, being the thermal decomposition of biomass occurring in the absence of oxygen at high temperature. It produces two beneficial substances - bio-char and combustible gases that are used for electricity generation. Bio-char is largely pure charcoal and is beneficial when added to soils as it improves organic matter, water retention and soil microflora. When fed to cattle it reduced methane flatulence, a concern, as methane is 21% more potent than CO₂ as a greenhouse gas. Locally produced Bio-char would be of immense value to the Bega Valley dairy and beef cattle farmers.
- **Syn-gas.** A form of waste-to energy is the process of generating energy in the form of electricity or gas from the primary treatment of waste. When used overseas, wood waste is the largest biomass energy source (dead trees, stumps, branch etc) but recyclables can also be shredded to produce Refuse Derived Fuel (RDF). The main gases produced from this process are hydrogen and carbon monoxide that can be further processed into methanol. Overseas, Syn-gas generators have in some cases directly replaced LNG/LPG required for commercial drying, metal working and other heating sources.
- **Organic waste disposal.** These systems are used in Australia with intensive animal production enterprises (pigs, chickens, dairy cows) where dung and urine are collected in anerobic ponds where methane, nitrous oxides and H₂S are produced. The methane is fed to a combustion engine for electricity generation to be used on farm or sold to the grid. Australian Carbon Credit Units are also generated, enhancing profitability. These systems are not suitable for processing high lignin and cellulose waste.

The Bega Valley region would be an ideal location to trial and cost these options as 65% of the land area is state forest or national park and therefore has a high potential to supply timber biomass. The region also has significant underutilized resources associated with the timber industry that if directed to biomass processing would provide labour and an economic return to the region. In addition, many local government bodies have problems in disposing of recyclable material, particularly now that Asian countries refuse to take this material. It would

be feasible to separate paper and plastic from this stream and use the material in the Syn-gas gasifier.

3. Aerial Firefighting Assets

During the 2019-20 bushfire season and earlier, the RFS has gained considerable experience in using a variety of fixed and rotary winged aircraft, to the extent that these assets are now a permanent component of the armoury. It is strongly recommended that the NSW and Federal Governments undertake a cost benefit analysis on purchasing suitable aircraft for this purpose. One such aircraft is the Canadair CL-415, an amphibious aircraft designed specifically for aerial firefighting. It can take 6,000l per load and would be ideal for aerial firefighting in SE NSW and the Snowy-Monaro region. It would be serviced and re-fuelled at airports such a Cooma and Merimbula, it would load water from coastal waterways or inland water storages and could be activated at the earliest notification of a fire outbreak. There are around 100 of these aircraft operating in the US, Canada, Portugal, Greece, Italy. As it is a high wing twin engine aircraft, the operating cost would be less that the fleet of helicopters hired from within Australia and the US for the 2019-20 season.

There is strong case for a small fleet of these aircraft be purchased by the Federal Government, possibly maintained by the RAAF and made available to state firefighting agencies when required. Such an arrangement fits in with the policy decision made this year to first engage the Federal Government in fire control and secondly to draw on the personnel and assets of the Defence Forces.

Terms of Reference 6

Land use planning, hazard reduction, indigenous practices

Reference is made in Section 5 to alternatives hazard reduction procedures rather than relying entirely on in-situ burning. This submission does not comment specifically on land use planning.

Cultural Burns

Within the Bega Valley Shire, calls are being made by some individuals to undertake “cultural burns” - applying land management practises used by Aboriginal communities prior to European settlement. Aborigines did use fire extensively but as a hunting tool, either to force prey from undergrowth or to burn off favoured grazing locations to encourage green pick that would then be attractive to herbivores. Such burns also encouraged certain food plants (bush potato) to grow by reducing competition.

There is no evidence in early anthropological records that Aborigines burnt specifically for fuel reduction purposes (see Donald Thomson, Professor of Anthropology, University of Melbourne 1901-1970). It should be noted that since the Federal Land Rights Act and the creation of Aboriginal owned pastoral enterprises, training curricula for those taking employment in this industry already includes units on land management and savannah burning. Such training is being given to indigenous students in Queensland and the NT (e.g. Katherine Rural College). In addition, extension programs of state departments of lands, the environment and agriculture now teach controlled burning methods using aerial ignition and remote sensing exemplifying the adoption of modern technologies over traditional methods.

The idea of a “cool burn” has been promoted by some. Such a land management procedure is only possible where the vegetative cover is of 7 to 10% moisture and the fuel load is no more than about 2-3 T/Ha. The objective is to have a mosaic of burnt and unburnt patches. Higher fuel loads mean hotter fires which will reach ground temperatures of 800° C or higher thus destroying the plant species one is trying to foster.

Within the Bega Valley Shire, traditional Aboriginal burning methods should not be re-introduced as such methods do not attempt to extinguish fires or use any of the proven fire control practices applied as the result of decades of research, analysis of past fires and the experience of those involved. Such practises include use of approval permits, meteorological data, fire breaks, trained personnel, tankers and other equipment, aerial support etc. Aboriginal land corporations should manage their land assets in the same way as all land-owners without any exceptions as now applies in northern Australia.

Terms of Reference 7 Future bush fire risks

As stated above, this Submission identifies several areas where future bushfire risks could be reduced. It is essential that the Bega Valley Bush Fire Risk Management Plan be re-written and adequate consideration given to new methodologies and procedures. A review of this Plan must give greater consideration to those in our community who live, work and contribute to the regional economy.

One issue of concern is the need to control and remove heavy timber growth alongside major highways servicing the region. The recent situation where the Princes Highway in NE Victoria was closed for 4 weeks is intolerable. This decision has impacted very severely on local business, particularly those catering for the tourist trade. With adequate future planning, roadside verges should have been cleared of encroaching timber as part of normal road maintenance.

Term of Reference 8 Emergency Response to Bush Fires, human resourcing and financing.

It is clear that RFS resources have been over-taxed during the 2019-20 emergency. The ability of RFS to respond over such a wide geographic area has been aggravated by a reduction in the number of available volunteers, the age of the tanker fleet, difficulties with the communications system, the lack of GPS vehicle tracking systems and the efficiency of personal equipment. These issues were highlighted in the 2018 analysis of the Tathra fire event of 18 March 2018 and it is of great concern to our Far South Coast community that there has been no meaningful attempt by the NSW Government to address the recommendations made in the Keelty Report on this incident.

This submission, and those supporting it, call for the immediate implementation of the recommendation in the Keelty Report to abolish fire district boundaries between RFS and NSWFR and that both services take steps to continue building strong respectful relationship with one another, particularly in management areas.

Additional RFS Resources for Tura Beach

This submission supports the call made by some members of the Tura Beach community to establish a RFS depot in the immediate area as large areas of State forest and national park are high risk locations close to the main commercial and residential areas. It is recommended that RFS be requested to undertake their prescribed analysis and assessment of the case for additional resources in Tura Beach. Such facilities, with additional volunteer support, would compliment the already overtaxed RFS Merimbula.

Terms of Reference 9 Inter-government collaboration

Reference has been made in Section 5 to using remote sensing technology to measure fuel loads. It is essential *Geoscience Australia* be given additional funding to develop its satellite mapping systems to facilitate this. The Federal Government's suggestion that it becomes more involved with state fire authorities is supported, particularly involving the Defence Forces in bush fire training.

Already there is good collaboration between the states, exemplified by the way in which bush fire agencies regularly call on other states for manpower and resources. Similarly, the arrangement where overseas personnel are brought in to support Australian volunteers and professionals is to be encouraged.

END



All photos December 2019

Aboriginal land behind Mariner retirement complex. Fuel > 20T/ha



Aboriginal land, access restricted for land management purpose.



Reserve, fuel load > 20T/ha



Reserve, bracken and fallen timber



Reserve, fallen timber



Reserve, leaf litter
approx. 10T/ha