

No time to de(con)struct: the accessibility of bush fire risk management plans in New South Wales, Australia

Prue Laidlaw, Dirk HR Spennemann and Catherine Allan discuss the accessibility of bush fire risk management plans in NSW

Abstract

Cultural heritage assets define our culture, providing a sense of place and emotional anchorage in space and time. As such they are regarded as assets worth protecting during disasters, including bush fires. Fire can damage cultural heritage assets through flames and radiant heat and via inappropriate fire suppression activities during and immediately after a fire. Good planning can provide for the protection of cultural heritage assets during bush fires, but the information within the plans must be easily understood.

This paper considers the accessibility of the information related to cultural heritage assets in all available NSW district bush fire risk management plans. Reading ease and reading age formulae were applied to each plan, and content analysis was used to explore the terminologies used, and the style in which the information was presented. The information regarding cultural assets in the plans was found to be difficult to read, replete with obscure terminology, and sometimes rambling and irrelevant; in short very inaccessible, especially in the high stress environment of a bush fire. The paper concludes with advice on improving the accessibility of bush fire risk management plans, advice which will be equally applicable to other disaster plans which consider the protection of cultural heritage assets.

Introduction

Southeastern Australia is the greatest bush fire prone area in the world (EMA 2003). Fire has always been part of the Australian environment, and has played a pivotal role in shaping the biota, and human societies (Kershaw et al. 2002; Gill, Bradstock and Williams 2002). It is both during and after a bush fire event that cultural heritage, Indigenous and historic, is at its most vulnerable, as fire and fire suppression has the potential to greatly reduce the historic character and fabric of the asset (Look and Spennemann 2000). Cultural heritage assets define our culture in space and time; they are part of the context that makes us human (Person and Sullivan 1995). They provide a sense of place and are emotional anchors in space and time (Lowenthal 1985) and thus are regarded as assets worth protecting for the benefit of community recovery (Spennemann and Graham 2007).

Fire does not distinguish between different types of cultural assets, their associated values and their constituent materials, but rather has the ability to obliterate all in its path as long as there is combustible material to fuel the fire (Look and Spennemann 2000). The effect of fire upon cultural assets is three-fold, as damage can emanate from the impact of the direct flame, from the indirect impact of radiant heat (NIFC n.d.) and from inappropriate fire suppression activities by disaster managers during and immediately after such events (Spennemann 1999a).

The paper forms part of a larger and ongoing research programme into the current state, level and nature of planning for the protection of cultural heritage places in the face of the ever-present natural hazards. Earlier research looked into issues of salinity (Spennemann 1998a; 1999b; 2001; Spennemann and Marcar 1999) and storms/wave action (Spennemann 1998b, O'Halloran and Spennemann 2002). Recent work examined the attitudes towards heritage protection held by NSW staff of the Rural Fire Service (Graham and Spennemann 2006a) and the State Emergency

Service (Graham and Spennemann 2006b) as well as the attitude of NSW heritage managers towards natural disasters (Graham and Spennemann 2006c). A study of the risk assessments in heritage planning augmented the research (Spennemann 2005). This paper is derived from an examination of the way the protection of cultural heritage assets is addressed in 111 bush fire risk management plans. Elsewhere we have reported on the comprehensiveness of the provisions in these plans (Laidlaw, Spennemann and Allan 2007) and the extent of uncritical replication of text passages and provisions from other plans (Laidlaw, Allan and Spennemann *in preparation*).

Bush Fire Risk Management Plans

The management of fire events in New South Wales is legally mandated under the *Rural Fires Act* (NSW) 1997, which establishes the NSW Rural Fire Service and makes provisions for the prevention, mitigation and suppression of rural fires. Part 3 of the Act provides for the establishment of the Bush Fire Coordinating Committee, which plans for bush fire prevention, for coordinated bush fire fighting, and is empowered to review Bush Fire Risk Management Plans (Farrier, Lyster and Pearson 1999).

The NSW State Disaster Plan (Displan) is a requirement under the provisions of the *State Emergency and Rescue Management Act* (NSW) 1989, and details the emergency planning, preparedness, response and initial recovery arrangements for NSW to ensure the coordinated response to emergencies by all agencies responsible for emergency situations. In its guidelines, the Displan recommends that during an emergency situation appropriate consultation, wherever practical, should occur with the responsible agencies, and that environmental, historical and cultural conservation concerns should be considered (SEMC 2000).

To assist in the development of district bush fire risk management plans, the Rural Fire Service of New South Wales provides a model plan (New South Wales Bush Fire Coordinating Committee 1998), which sets out the recommended structure of a bush fire risk management plan and provides guidance on what the plan document should include. While some sections provide quite detailed sample text, such as the section on the protection of threatened species, the guidance provided on cultural heritage is very limited. The instructions provided are nearly identical for places of Aboriginal Significance and Historic Heritage (New South Wales Bush Fire Coordinating Committee 1998):

(a) *Places of Aboriginal Significance*

Instructions (delete from Committee's plan)

Identify whether places of Aboriginal significance occur in the Bush Fire District. If appropriate, identify areas with concentrations of significant sites that may be damaged by fire. If area references are used they should be broad (eg. Kincheha NP, Mt Belmore SF etc).

(b) *Historic Heritage*

Instructions (delete from Committee's plan)

Identify whether places of historic heritage importance exist in the District. If appropriate, identify areas with concentrations of significant items (eg. Villages of Hill End, Sofala etc) identify only those where the occurrence of fire (wildfire or prescribed fire) has the potential to cause damage to the heritage items.

The wording of these formulations implies that content, complexity and language of the individual bush fire risk management plans has been solely left to the discretion of the respective bush fire management committee authoring the plans. There is an unstated assumption in the bush fire risk management planning process that a plan that has been written by a committee of local authorities will be locally 'owned' and will reflect the special local needs and conditions. It is also assumed by those requiring that such plans be written, that the plan content is intelligible to the intended user during situations of emergency. But are those assumptions a reflection of reality?

While all plans are purportedly written for the local situation, a review of all available bush fire risk management plans (n=111) for the state of New South Wales revealed that copying and often indiscriminate adoption of sections content from other bush fire risk management plans is not uncommon (Laidlaw 2004). Thus much, or at least some, of the wording of the plans has been borrowed and does not necessarily reflect the language ability of the plan authors (Laidlaw, Allan and Spennemann *in preparation*).

This paper will focus on the cultural heritage related sections of all available NSW bush fire risk management plans, and will consider how accessible these plans are for the average user and lay reader. It will do so by addressing two aspects: the overall readability of the plans in terms of language and sentence complexity; and the jargon and technical terminology used in the plans.

Readability and Reading Age

A significant part of the planning process involves anticipating the stress and psychological dislocation that accompany a disaster (Nelson 1991). During a disaster situation clear-headed thinking is likely to be impaired, and for this reason it is important that the disaster plan in place be easily understandable and clear in its intentions.

While *legibility* indicates that the text can be read (that letters and words can be recognised), readability is a measure of the accessibility of a legible piece of writing. It describes the ease with which a text can be read and thus indicating how wide an audience it may reach. In addition to the complexity of the language, presentation factors unrelated to the language of the text also affect readability: for example, choice of typeface, text size, layout and colours. The *comprehensibility* of a text is an interaction between the reader (drawing on prior knowledge of the content and the text features of the material read) and aspects of the text itself. It assesses to what extent users actually understand the messages conveyed in the text.

A number of studies have been carried out looking at the readability of documents and public information material, such as consent forms for research projects (Mathew and McGrath 2002), questionnaires (Winzenberg *et al* 2003); Australian Legislation (Richardson and Smith 2002), privacy policies (Graber *et al* 2002); computer journals (Lemos 1985) and computer documentation (Klare 2000). It is particularly prevalent in the fields of medicine and allied health, where the conveyance of unequivocal and easily understood information is critical. Studies looked at patient information leaflets (cf. Adepu and Nagavi 2004), drug information (Koo *et al* 2003), information hand outs (Griffin *et al* 2003) and other health education materials on the World-Wide Web (D'Alessandro *et al* 2001; Smart and Burling 2001; Gottlieb and Rogers 2004).

A readability test is a technique for predicting the reading grade level required of the average reader in order to understand the written material (Flesch 1949; 1951; 1962). Commonly used tests are the Flesch Reading Ease Score and Flesch-Kincaid Grade Level tests, both of which are provided as a tool by the popular word processing packages Microsoft Word™ and WordPerfect™. Other tests exist, such as Gunning's Fog Index (Gunning 1952), the Simplified Measure of Gobbledygook (SMOG) Grading (McLaughlin 1969), and the Fry Readability Graph (Fry 1977, p.217), but

none of these dramatically improve on the outcome. Although most formulas have acceptable validity and reliability, they are often criticised for their limitations (Fry 1997, p. 218). While taking into account sentence length, syllable count, or vocabulary index, they tend to be insensitive to word order or grammatical complexity. Thus, if anything, the Flesch tests used in this paper underestimate the level of reading ability required by a user.

The Flesch Reading Ease equation uses a measure of the average sentence length in words (ASW), and the average number of syllables per word (ASL), with the assumption that the fewer syllables a word possesses, and the fewer words a sentence contains, the easier they are read and comprehend. The Flesch Reading Ease Score is based on the following empirically derived formula:

$$206.835 - (1.015 \times ASL) - (84.6 \times ASW)$$

The formula results in a reproducible and predictable score in between 0 and 100, with higher scores signifying greater reading ease.

The Flesch-Kincaid Grade Level test is directly related to the Flesch Reading Ease test as the Flesch-Kincaid score mathematically converts the Flesch score into a grade level estimate. Grade level estimates range from 5th to college post-graduate grade. Although the grade level estimates are based on the 12-grade American school system, for the purpose of this study they are deemed appropriate to be used as investigative tool in the Australian context, which also has a 12-year school structure. A more limiting problem is inherent in the way Microsoft Word™ calculates the Flesch-Kincaid Grade Level, as it does not calculate beyond grade 12.

Readability and Reading Age of Bush Fire Risk Management Plans

An analysis of the readability of the bush fire risk management plans was carried out on that segment of content relating to cultural heritage assets.

The Flesch reading ease scores obtained ranged from 3.9 (Lismore BFMP) to 58.1 (Crookwell BFMP). The average Flesch reading ease score for the current bush fire risk management plans was 35.1±7.7 (median 35.2). The distribution of scores shows that the majority of plans scored between 30 and 45 (figure 2). Table 1 sets these scores into context by showing both Flesch's original magazine categories and contemporary Australian examples.¹

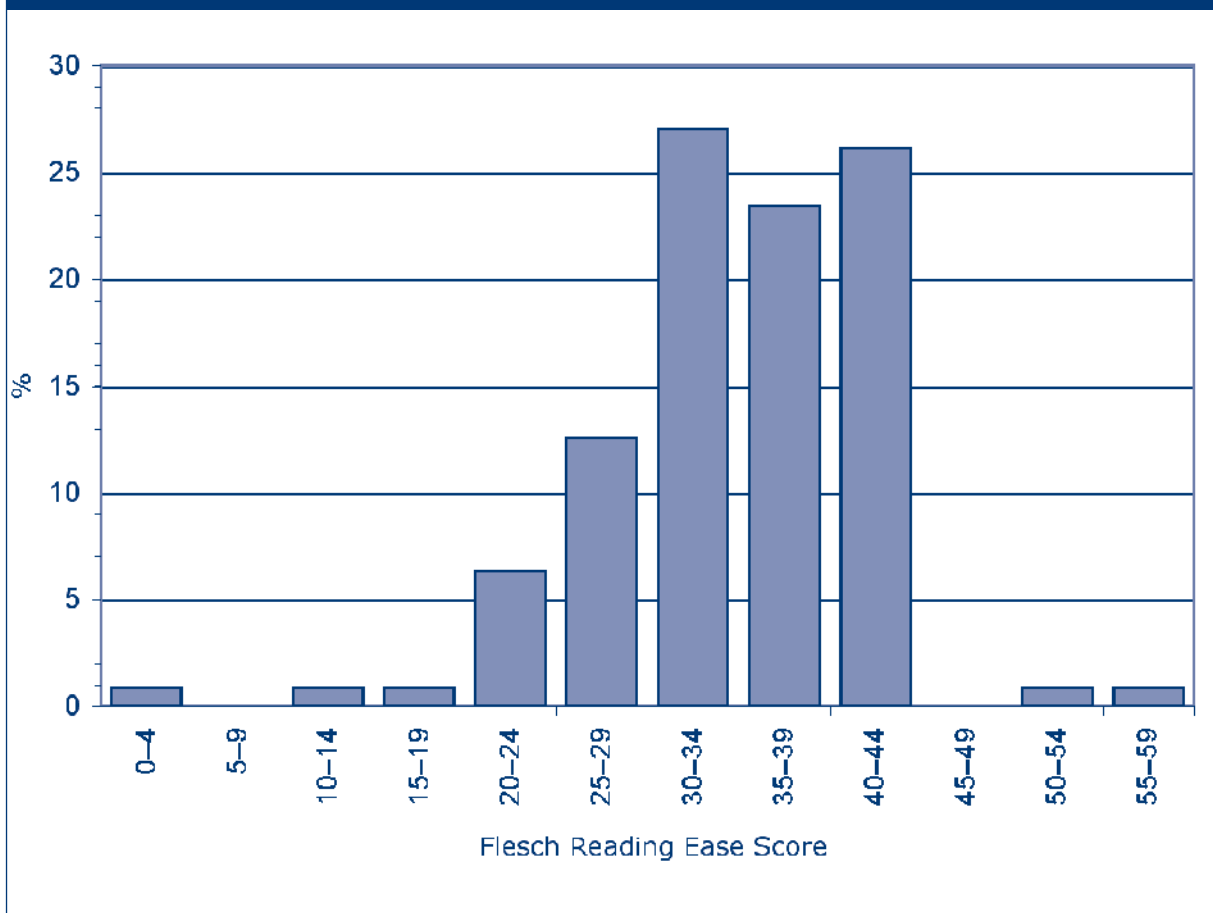
1 Sources: Wilmoth, Peter (2004) Babes in arms. The Age (Melbourne) 24 October 2004. On-line. FRES: 71.8/FKGL: 6.8.—Peter Carey 'Parcel 1' from 'True History of The Kelly Gang' St. Lucia: University of Queensland Press, 2001. FRES: 74.8/FKGL: 7.8.—Gerangelos, Peter (2002) The Separation of Powers and Legislative Interference with Judicial Functions in Pending Cases. Federal Law Review 30(1): 1–38. FRES: 28.0/ FKGL: 12.0+.—Weinberger, Norman M. (2004) Music and the Brain. Scientific American. November 2004. On-line version. FRES: 38.7/ FKGL: 12.0+.—Parker, Jim (2004) Tame CPI eases interest rate fears. Australian Financial Review 27 October 2004. On-line version. FRES: 44.6/ FKGL: 12.0+.— Peter Carter Brown, Extract from 'No Law Against Angels.' Sydney: Horwitz, 1957: FRES: 87.4/ FKGL: 4.3.— Jane Downing, chapters 1 and 2 from 'The Trickster,' Canberra: Pandanus Press, 2003. FRES: 66.9 / FKGL: 8.0

Table 1. Reading Ease Score of the Bush fire risk management plans (adapted from Flesch 1949, p.164 with Australian equivalents)

Flesch Reading Ease Score	Flesch-Kincaid Grade Level	Flesch Magazine Category	Australian Examples	% of Bush fire risk management plans
91-100	5th	Comics	Comics	0
81-90	6th	Pulp fiction	Peter Carter Brown, 'No Law Against Angels'	0
71-80	7th	Slick fiction	Peter Carey 'True History of The Kelly Gang' Feature Story in "The Age"	0
61-70	8th-9th	Digests	Jane Downing, 'The Trickster'	0
51-60	10th-12th	Quality		2
41-50	College	Academic	Australian Financial Review	26
31-40			Scientific American	50
16-30	Graduate	Scientific	Federal Law Review	20
0-15	Post Grad		Traditional insurance policies	2

Incidentally, the reading age for the cultural heritage instructions in the model plan is FRES: 37.1/FKGL: 11.3

Figure 1: Distribution of Flesch reading ease scores of NSW Bush Fire Risk Management Plans (in %; n=111)



The low reading ease scores mean that sentences within the bush fire risk management plans are long, and the words long and complex, as exemplified by the following text sample:

There is evidence to suggest that the absence of fire and changing land use patterns since white settlement in some areas, has led to the proliferation of woody weed species and a resultant loss in grazing land

extract from Central Darling bush fire risk management plan.
Flesch Reading Ease Score 43.5, Flesch-Kincaid Grade Level 12+.

The longer a sentence, the more ideas the mind has to hold in suspense until a final decision can be made as to what the words mean all together. When this is combined with unfamiliar terminology and jargon, increased mental work is needed by the user to understand the meaning of the content (Flesch 1949).

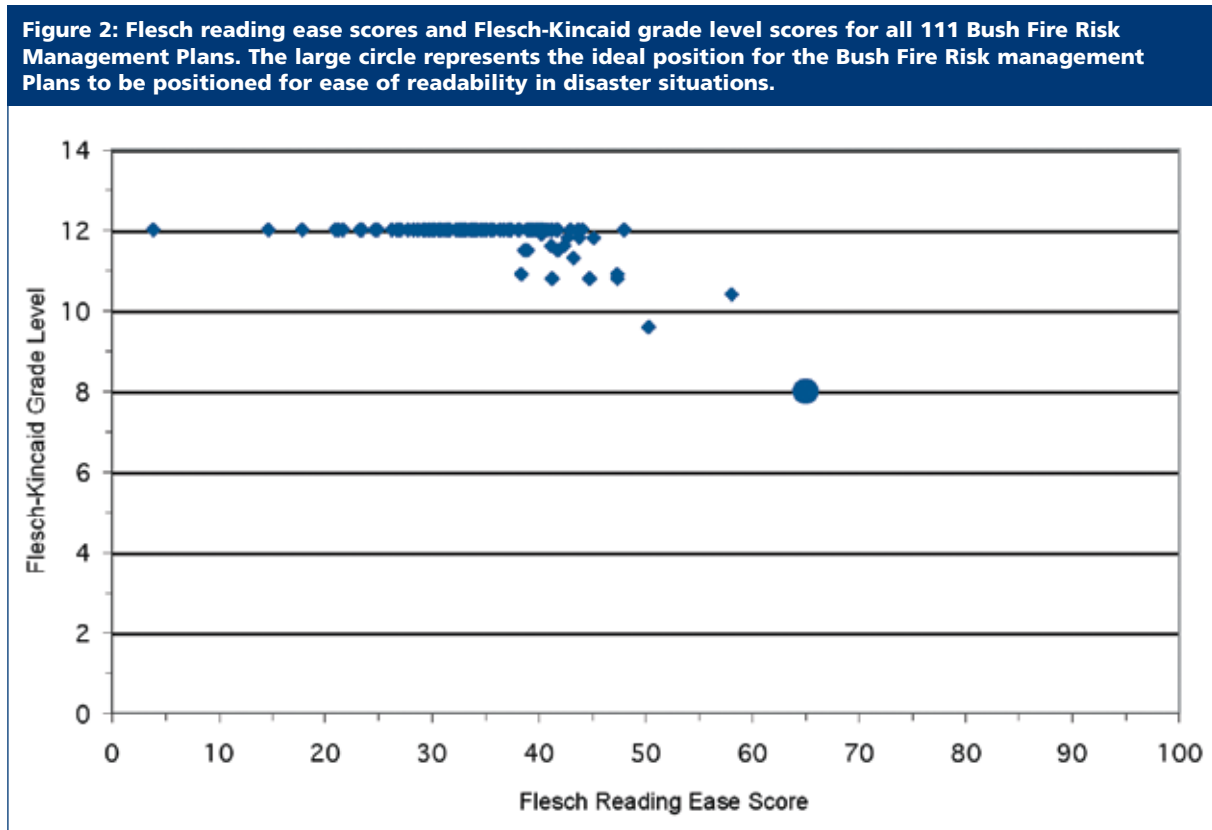
Using the Flesch-Kincaid formula, to be clear in intent and easy to understand a document should be written for a grade 8 education level. The majority of the bush fire risk management plans (82.9 per cent), however, was only easily understandable to a person who has had at least 12 years of continuous education, or is at the minimum 12th grade (U.S) standard (figure 1). The lowest grade level exhibited was 9.6, while the remaining 17 bush fire risk management plans (15.3 per cent) ranged between grade levels 10.4 and 11.9, all having very high (ie difficult) readability scores. The clustering of the results at a maximum grade level 12

reflects the shortcoming of the MS Word feature, which does not compute higher grade levels.

The readability scores of the bush fire risk management plans may have grim consequences for the effective implementation of the content during a disaster situation. Stress and strain, compounded with the need for immediate action can impair judgements and compromise decision-making (Rohrman 1996; Moran 1998). For this reason, the bush fire risk management plans should be relatively easy to understand and be clear and concise. It is recommended that the optimum Flesch reading ease score is between 60 and 70 (Flesch 1949), resulting in a Flesch-Kincaid grade level score of 8 (Figure 1). At this level, the average reader is not struggling with or skipping over the content, and can easily understand the bush fire risk management plans without having to re-read sections.

The clientele

The question to be asked is whether a Flesch Reading Ease Score of 30-45 is taxing the average reader of the bush fire risk management plans? The main users of the bush fire risk management plans are the New South Wales Rural Fire Service. The Rural Fire Service has a membership of over 69,000 volunteer fire fighters, providing emergency services to over 90 per cent of New South Wales (RFS 2003). Volunteer fire fighters come from a wide variety of occupational backgrounds. A recent study of RFS Brigade Captains by Graham



(2002) found that the prominent occupations were that of *primary producer* (48.4 per cent), and *tradesman* (12.6 per cent), thus reflecting the voluntary nature of the organisation. Although these people may be skilled in their various fields, they cannot be expected to be experts in cultural heritage management. Other users of the bush fire risk management plans are the New South Wales National Parks and Wildlife Service, Forests New South Wales and New South Wales Fire Brigades, under provisions made for coordinated bush fire fighting in the *Rural Fires Act 1997* (NSW).

A recent survey by Ryan (2001) found that 26 per cent of 154 RFS volunteer fire fighter respondents, had reached secondary school level (non-specific), 18 per cent had completed a short course, 34 per cent had reached a diploma or certificate level, and 16 per cent had completed a tertiary degree. These results, when combined with the readability of the current bush fire risk management plans, raise some interesting issues. If the results of Ryan's (2001) survey are extrapolated to represent the entire 69 000 RFS volunteer fire fighters, using the Flesch (1949) formula approximately one-third could be expected to clearly understand the bush fire risk management plans under 'normal' circumstances. The additional 34 per cent that had completed a diploma or certificate level may also be able to easily understand the bush fire risk management plans, however entry into these levels of education do not necessarily require the completion of secondary school.

Is a Flesch Reading Ease Score of 30–45 taxing the average reader of the bush fire risk management plans under normal circumstances? Probably not; however, 22 per cent of the plans require an 'academic' reading level which is taxing for the average reader.

Now consider the reading environment in a fire control room, where fire fighters are dealing with complex, changing situations, and where each decision made may have long-reaching impacts on the district. In such situations the recommended optimum Flesch reading ease score of between 60 and 70 becomes even more important. If the information contained in the bush fire risk management plans is held to be a necessity in a disaster situation, there is little time for the user to be struggling with the content. The bush fire risk management plans as currently written certainly appear to fail the user.

Terminology

The general readability of the bush fire risk management plans is only one consideration. To be effective in its application during a disaster event, a bush fire risk management plan should be free of complex terminology and jargon. Content analysis was chosen

as the research method, as it uses a set of procedures to make sound inferences from text, in relation to the sender of the message, the message itself, or the audience of the message (Weber 1990; Babbie 2001; Neuman 2003). A systematic content analysis method was used to identify (i) terms within the bush fire risk management plan that were deemed to be technical jargon, and (ii) potentially confusing clusters of terms that represented one asset type.

The range of terminology used within and between the 111 bush fire risk management plans analysed is diverse to say the least. Many similar terms have been used to describe one asset type, while confusing jargon has been applied to situations where it is not needed.

Within the Model Plan, the overarching term *cultural assets*, defined as "areas of prehistoric or historic significance dating from Aboriginal and European occupation", has been used to signify both historic heritage and Indigenous heritage assets. This term is further broken down in the Model Plan into Places of Aboriginal Significance and Historic Heritage (see above). However, many Bush Fire Risk Management Plans have used different terms to distinguish between the two heritage types. In regard to the Historic Heritage component for example, the title has been changed to read: *Areas of non-Aboriginal Heritage*; *Historical Sites of post European occupancy*; *Other historically significant sites*; *European Heritage*; or even, the more generic *Cultural Heritage*.

The Places of Aboriginal Significance component has also been given a range of alternative titles such as *Aboriginal cultural heritage*, *places of significance for Indigenous Australians* and *Areas of Aboriginal significance*. Also of interest here is the use by 28 bush fire risk management plans of the term *aboriginal* with the lower case letter 'a'. When used in this way, the common noun refers to an original inhabitant of the land. Although the plan authors may not have intended this, and it is used through ignorance rather than denigration, the word should be used in the form of a proper noun. In this form, an upper case letter 'A' is used to signify that the term refers to Indigenous Australians, a matter about which many Indigenous Australians are quite sensitive.

This divergence from the text as set out in the Model Plan, although exhibiting individuality between the plans, may cause confusion for the user as to the meanings of the terms used.

The small variety of alternative titles used for the components of the bush fire risk management plans stands in direct contrast to the copious variety of terms used to describe the diversity of both Indigenous heritage assets and historic heritage assets within the plans. The overwhelming use of jargon is apparent in the 39 different terms used to describe specific Indigenous heritage assets. An example of this

abundance can be found in the description of scarred and carved trees, where the terms *marked tree*, *sacred tree* and *significant tree* have also been used in other plans.

A further example can be found in the terms used to describe Indigenous art, such as *rock art*, *stencil paintings*, *drilled and abraded outline figures* and *cave paintings*. Although the terms provide greater detail than an all encompassing term such as Indigenous art, without the addition of a clear definition describing the asset, the terms are all but meaningless; providing confusing jargon at a time when specific content is needed. One exception to this can be found in the Inverell bush fire risk management plan where the term *scarred and carved trees* is accompanied by a clear description of the assets:

Scarred and Carved Trees

The Shire contains numerous scarred trees which are trees that have had their bark/wood removed for the making of coolamons (carrying containers), shields, shelters and canoes. These types of trees can be found anywhere throughout the Shire with the exception of canoe trees that would only be found in close proximity to permanent water.

Carved trees are very rare in this area. These trees were used as burial markers and ceremonial areas. The bark was removed from the tree and markings such as diamonds and straight and curved lines were carved into its timber. Any fire may be a danger to this type of tree

extract from Inverell bush fire risk management plan (BFMP)

In describing Indigenous heritage assets that relate to camp sites and occupation sites, a wide variety of terminologies has again been used within the plans. Terms such as *artefacts*, *artefact scatters*, *occupational deposits*, *isolated finds*, *hearths* and *shell middens* have been used interchangeably to describe much the same Indigenous heritage assets. Some confusion surrounds the use of the nonsensical term *oven mould* within two bush fire risk management plans (Albury-Hume BFMP; Corowa Berrigan BFMP), although the possible link to a third document's use of the term *oven mound* (Culcairn BFMP) suggests a possible typing mistake while copying from one plan to another, a scenario made more likely as the districts involved are geographically closely connected. Other terms such as *camp sites*, *food gathering localities*, *open campsites*, *fish traps*, *wooden Aboriginal implements*, *quarries* and *axe/spear grinding grooves* have also been used. Again, the majority of these terms are not accompanied by a further description of the asset, resulting in possible confusion and perplexity at the array of terms used.

When it is considered that during bush fire events, fire fighters often move between districts in cooperative efforts to control a fire, the variation of terms used within the bush fire risk management plans becomes even more important. Consistent and familiar

terminology throughout the state would reduce the potential for confusion.

Perhaps the greatest variety of terminology in relation to *Indigenous heritage assets* was in regard to Indigenous association with the asset. The user of each bush fire risk management plan is bombarded with many different terms that do not result in a clear picture of the asset. Terms that seem to be influenced by archaeological assessments are common. These include *ancient human association*, *Aboriginal occupation*, *archaeological record*, *archaeological relics*, *archaeological sites*, *potential sites*, *recorded sites*, *known sites* and *unrecorded sites*. Although these terms may have been clear to archaeologists at the time, they are not entirely appropriate to be used within bush fire risk management plans, as the accompanying level of description of the asset is extremely low. The use of the seemingly interchangeable terms of *place*, *item*, *relic*, *asset* and *site* could cause another problem, as the terms may have different meanings attached to them, but are used for the same purpose within the bush fire risk management plans. With no description as to the difference between the terms, the situation is problematic at best. Terms such as *sensitive cultural site*, *spiritual site* and *traditional spiritual link* are complex concepts at the best of times and not appropriate in bush fire risk management plans without elaborate explanation.

The wide range of terminology used in relation to Indigenous heritage assets, is mirrored in *historic heritage assets*. Again, there is an overwhelming amount of terminology and jargon used within the current bush fire risk management plans that has potential to cause great confusion during a disaster situation. For example, a large variety of terms have been used to describe historic heritage building types. In the simplest form, terms such as *house*, *cottage*, *building*, *homestead*, *dwelling*, *structure* and *terrace* have been used. In regard to *hotels*, the terms *pub* and *tavern* have been used interchangeably, while specific references to building design types include terms such as *interwar*, *Federation*, *Victorian*, while other refer to the construction method, such as *slab hut*, *wattle and daub*, and *pisè* to name a few.

Further excessive use of terminology can be found within the Wollongong bush fire risk management plan in relation to a description of mining heritage assets.

Evidence of adits, portals, spoil dumps, machinery, tramways, ventilation shafts, pony stables, trails and inclines still remain at their original locations, particularly within the escarpment

extract from Wollongong BFMP

The same problem is also apparent in the Kyogle bush fire risk management plan through the use of terms describing historic heritage assets from the early timber

industry. The use of the terms is again accompanied by no descriptive text other than the terms themselves, which may be of little meaning to some users of the bush fire risk management plan.

Examples of historical sites which may be damaged by fire include; stepped tree stumps remaining from early timber industry, signature trees and associated abandoned ruins, old bridges and examples of early bush craft (post and rail fence sections etc)

extract from Kyogle BFMP

Although the terms used are specific in nature, there is no additional descriptive content that better informs the user as to the meaning of the terms, and no supplementary glossary. Consequently, these terms may have no meaning to some users of the plan, and will be of no assistance in locating the assets in a bush fire situation.

An interesting variety of terms have been used in relation to the seemingly simple description of regional towns. Terms such as *village, hamlet, abandoned ruin, settlement* and *township* have been used. It is not possible to ascertain whether there is a specific difference between the terms in relation to town size or location, or whether the terms are used interchangeable and have the same meaning.

Given the plethora of terms used both between various plans and within plans, there is a need for a standard terminology that is self evident to the user, and that contains the correct level of detail required to engage in protective and preventative measures during high stress situations.

Discursiveness

The matter of accessibility of plans to the average user, however, extends beyond readability of sentence structure and the level of jargon used. Emergency management plans should be concise and to the point. There is no room for extraneous information, irrelevant content or information that is detailed beyond the requirements of the situation the plan addresses; all of this merely further complicates the already high level of readability of the bush fire risk management plans.

The content analysis of the bush fire risk management plans exposed text that was considered to be generally incomprehensible and/or discursive in its descriptions.

Any terms used to describe cultural heritage assets need to be accompanied by a description of the asset. However, the extensive use of terminology and the low reading ease of the bush fire risk management plans are further compounded by instances of discursive description and content of doubtful appropriateness:

To the south of Cessnock City, the Great North Road represents one of the greatest feats accomplished by the early settlers in opening up the Hunter region. This road shows early construction method and the hardship endured by convicts in forced labour situations. It is now a popular tourist and educational facility passing on the knowledge of NSW's early heritage. There are a number of historic buildings associated with the Great North Road such as Laguna House and the historic village of Wollombi

extract from Cessnock BFMP

The heritage of the Blue Mountains closely reflects the unique qualities and grandeur of the natural landscape. Important associations and items of heritage value lie with its role as an aboriginal meeting ground, the constraints it presented to the early settlers and in the eventual traversal of the mountains by explorers (1813), road (1814) then rail (1860's)

extract from Blue Mountains BFMP

Disaster plans should be concise and succinct in conveying information, and should not include large amounts of extraneous information, as this can serve only to intimidate the user (Gordon 2002). Of the 111 bush fire risk management plans, nine used discursive, or rambling, content when describing cultural heritage assets. Much of the content related to non-Indigenous history, settlement and use of the region, Indigenous occupation of the region, and descriptions of the geology and topography of the region. Although the supplementary content may provide background information on the development of the region and add to the understanding of significance, it is inappropriate in this section of the bush fire risk management plan. The extraneous nature of the content does not lend itself to being read and retained by the user with an immediate emergency response to organise or implement.

Perhaps more important than the presence of discursive content in the bush fire risk management plans, is the incomprehensibility of some of the text relating to cultural heritage assets. Of the 111 bush fire risk management plans, nine contained obscure content that could not be easily understood. The majority of this obscure content was in regard to risk management, planning boundaries, and Indigenous heritage asset location and management:

The less residual nature of grass fires will hopefully infer a reduced vulnerability of these sites to serious damage in a wildfire event

extract from Bega Valley BFMP

It is on Shalimar Station which is leased land in Moree Plains Shire. It is, however, geographically more closely tied to Bingara Shire and should therefore be noted and planned for by the Rocky Creek Rural Fire Brigade

extract from Bingara BFMP



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The main users of bush fire risk management plans in New South Wales are the Rural Fire Service.

Obscure content again serves as an inhibitor to the user in retaining important information. Other quite irrelevant content that is only poised to contribute to confusion and misunderstanding by the user includes references to numbers of cultural heritage assets in the region:

There are currently 42 archaeological sites registered with the NSW National Parks and Wildlife Service along the coastal strip between the south bank of the Tweed and the north bank of the Brunswick River. Of these, 26 (62 per cent) are shell middens, 8 (19%) are open campsites, 5 (12 per cent) are Bora/ceremonial grounds, 2 (5 per cent) are burials and 1 (2 per cent) is a sacred tree. Twelve additional middens and seven open campsites have been recorded at Terranora immediately north of the Tweed River

extract from Tweed BFMP

When this is compounded by the specific terms used and the absence of accompanying descriptions of the assets, the abundance of detail obscuring the message can become daunting to the user, and difficult to retain for future reference.

The need for information in disaster plans to be clear and concise cannot be overemphasised if emergency personnel are to read, retain and put into practice the message the text is conveying. This is even more important when directions are given to fire brigades to reach a house fire:

A number of other pastoral station homesteads have historical importance and every effort is made to preserve them from bush fires. However, fires that start within the buildings are quite often terminal as the length of time taken by either NSW Fire Brigades or the Rural Fire Service Brigades to attend the fire usually is in excess of 15 minutes due to the distances involved in travelling from the fire station to the fire

extract from Warren BFMP

The dismissive tone of the content and the use of the word however seems to imply that the responsibilities of the user are relinquished in this situation. If clear headed thinking is a requirement during a disaster situation, the content of bush fire risk management plans should not compound the situation by being ambiguous in its intent.

Implications

The observed low reading ease of the current bush fire risk management plans, the variety and use of different terms and jargon used within and between plans, and the occurrence of discursive and incomprehensible content are compounding factors which give rise to serious concern as to whether the bush fire risk management plans are actually usable documents in emergency situations. If not, then this could signify a bleak future for the protection of cultural heritage assets in disaster situations.

What is unknown at this stage, however, is whether the information contained in an individual bush fire risk management plan is clear and concise to the user of that particular bush fire risk management plan. While the bush fire risk management plans exhibit a diversity of terms and seemingly intimidating content, the content may well be regionally specific, and thus easily understandable to the user. Yet the variety of content may become problematic in situations where fire fighters from different districts, or even different states of Australia, are cooperating together.

This unfamiliarity can be overcome by the use of training, drills and mock scenarios. A brief review of current RFS training modules (RFS 2001; 2002a–d) indicates that specific information regarding cultural heritage assets is not contained in any of the modules. While practical training not reliant on training modules could

well involve cultural heritage assets, not one of the total 111 bush fire risk management plans incorporated a prescribed drill or mock scenarios with respect to cultural heritage asset protection into the framework of the planning process. This is despite the knowledge that exercising a disaster plan in the form of a prescribed drill assists in refining the information it contains, and reviews any lack of knowledge on the part of the users (Gordon 2002; Nelson 1991). In the absence of drills and 'dry runs', any shortcomings the plans may contain, and any incomprehensibility inherent in the documents, will not be detected until such time that a real event occurs.

Under the *State Emergency Service and Rescue Management Act 1989* (NSW) (as amended) training is an integral part of the operation of disaster plans. The New South Wales State Disaster Plan (Displan) (SEMC 2000) requires that emergency agencies, in developing and conducting training, are to consult with the relevant agencies and authorities with a responsibility for environmental, historical, heritage or cultural conservation, and where appropriate incorporate the agencies' concerns into training programs. The current state of information contained within the bush fire risk management plans indicate that there is clear need for training and exercising of plan stipulation if cultural heritage assets are to be adequately protected.

If bush fire risk management plans are the only source of information regarding the protection of cultural heritage assets as provided to the RFS volunteers, NPWS, State Forests and other users, then the information must be clear, concise and easily understood. Bush fire risk management plans must be easy to read and understand, so that the user is not struggling and skipping over important content. The use of familiar terms in place of technical jargon is essential if the user is to effectively retain and apply the information given. Furthermore, the information must not be extraneous or ambiguous in nature as this can only compound upon a stressful situation, when clear headed thinking is imperative to the effective implementation of the bush fire risk management plans.

Where to from here?

This paper has shown that current bush fire risk management plans exhibit a difficult level of readability, which is compounded by the use of unfamiliar and technical terms, and the presence of ambiguous, discursive and incomprehensible content. The current bush fire risk management plans are up for review, with new documents to be drawn up from 2005 onwards. This gives an opportunity to address a number of issues.

It is highly desirable that systematic process is implemented which evaluates the quality, detail and depth of plan content necessary for the implementation of bush fire risk management plans in emergency

situations. This would alleviate the issue of unnecessary and discursive content. Any discursive text and other contextual information that is not central to the bush fire risk management plan, but that fire fighting staff should know or be aware of, should be included in a separate training and background document. This document can be used by the fire services during training sessions and in sessions leading up to drills and scenarios.

The terminology needs to be uniform across the state and ideally uniform across Australia. The NSW Local Government Planning literature, for example, uses a standard set of terms that are deemed to be understood without specific need of glossaries (NSW 1980). It is desirable that the bush fire risk management plans use a similar standardised set. Any terms not included in that set, but which are deemed essential, should be explained in a glossary.

Finally, attention should be given to the level of language and the complexity of sentences used. Before plans are finalised, some measure of readability should be calculated. Moreover, it would be desirable to test the readability of a plan by exposing untrained staff to an unfamiliar document in a simulated pressure situation, querying comprehension and retention of information.

Bush fires in Australia are an inevitable natural hazard; their impacts can be minimised but never totally removed. That, however, does not provide justification for putting cultural heritage assets at risk by developing bush fire risk management plans that fall short of their potential.

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About the authors:

Prue Laidlaw is from the School of Environmental Sciences, Charles Sturt University, P.O. Box 789, Albury, NSW 2640, Australia. E-mail: plaidlaw@csu.edu.au

Dirk HR Spennemann is from the Institute for Land, Water and Society, Charles Sturt University, P.O. Box 789, Albury, NSW 2640, Australia. E-mail: dspennemann@csu.edu.au and Catherine Allan is from the Institute for Land, Water and Society, Charles Sturt University, P.O. Box 789, Albury, NSW 2640, Australia. E-mail: callan@csu.edu.au.

The main contact is Associate Professor Dirk HR Spennemann, who may be contacted at the Charles Sturt University, P.O. Box 789, Albury, NSW 2640, Australia. E-mail: dspennemann@csu.edu.au; Phone: +61-2-6051 9947; Facsimile: +61-2-6051 9897.

