Fire-attributes categories, fire sensitivity, and flammability of Tasmanian vegetation communities

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Abstract

This paper provides an explanation of three fire themes that have been derived from the TASVEG vegetation community classification: fire-attributes category, fire sensitivity, and flammability. The 24 fire-attributes categories are groups of TASVEG communities that have mostly similar fire sensitivity and flammability characteristics, or are names widely used by land and fire managers. Five fire sensitivity categories indicate the potential ecological impact of a single fire on the relevant vegetation community. The four flammability categories indicate the likelihood of the vegetation community burning at various times of the year. These fire themes will provide GIS mapping layers that can assist decision making by fire managers during fire suppression operations and fire management planning. Each theme provides a significant reduction in the complexity of TASVEG and will be easier to interpret visually on printed and electronic maps produced by GIS.

Introduction

The mapping of Tasmanian vegetation communities has been ongoing for decades as a result of various projects involved with forest management and conservation. The Tasmanian Regional Forest Agreement and the TASVEG project saw the amalgamation and consolidation of much of this mapping, as well as the addition of new work (Harris and Kitchener 2005). Although the revision and improvement of the TASVEG map will continue, there is now a unified vegetation map for the whole of Tasmania that can be utilised for land management applications such as fire management.

Fire managers need vegetation maps for the following purposes:

- To determine priorities, objectives and strategies during fire suppression operations;
- To identify fire attributes of vegetation at the broad landscape level in the preparation of fire management plans;
- Following from the above, to plan prescribed burning programs based on ecological and/or fuel reduction objectives which are appropriate for a specified vegetation community;
- To plan the location and specifications for fire breaks and fire trails.

TASVEG version 1.0 has 153 vegetation community codes and 714 different entities. This is the number of possible combinations of codes for vegetation community, forest structure, the disturbance attributes 'cut-over' and 'recently cleared', and scattered trees (non-forest communities). Even for people with an extensive knowledge of Tasmanian vegetation, this amount of information and complexity is daunting, particularly when presented on maps. We were asked by fire managers to derive some simplified themes from the TASVEG map to assist fire management, particularly for those people with less experience. For example, some questions for which fire managers want answers are:

- Does the vegetation map tell us anything about the flammability of different vegetation types?
- Where does a given wildfire or planned fire have the potential to spread?
- Is it possible to print a vegetation map or look at it on a computer screen and readily identify general vegetation types?
- Which are the fire sensitive vegetation types and where are they?
- What does fire sensitivity actually mean when there is a wildfire?

To assist fire managers, we derived three simplified themes from TASVEG:

1. Vegetation categories based on fire attributes (24 categories);
2. Fire sensitivity (five categories);
3. Flammability (four categories).

This paper explains the codes that we have assigned to the Geographic Information System (GIS) polygons of the TASVEG vegetation map for the above three themes. The vegetation layer with fire themes will be used by personnel from Forestry Tasmania, Parks and Wildlife Service, and Tasmania Fire Service who work on Incident Management Teams during wildfire suppression operations. We hope that these vegetation, fire sensitivity and flammability maps will also be used by fire managers, landowners and all managers of native vegetation in Tasmania for fire management planning.

The fire sensitivity classification described in this paper is a way of summarising and representing appropriate fire regimes for vegetation communities (Gill 1981). A similar approach is used in fire management plans in New South Wales (e.g. see Map 14 in Conacher Travers 2004). Similarly, what we have called flammability in this paper is comparable to the classification of vegetation communities into 'fuel groups' in fire management plans in New South Wales (e.g. see Map 11 in Conacher Travers 2004). Tasmania is unique amongst the Australian States and the mainland Territories in having a statewide map of vegetation communities at the level of resolution of TASVEG. Thus, this paper may be the first attempt in Australia over an area the size of Tasmania to classify vegetation communities for use in a GIS by fire managers.

Development of fire themes

We analysed version 1.0 of the TASVEG computer map with MapInfo to produce a list of all the vegetation community codes and the number of polygons of each of these. This map was available to us as a single coverage of all Tasmania, including the islands. We then created a look-up table from this vegetation community list and assigned codes for each of the three fire themes (Table 1). The look-up table was then used to update the fields for fire-attributes category, fire sensitivity, and flammability in the main TASVEG layer. The methods we used to determine the codes for the three fire themes are explained below.

Fire-attributes category

We grouped the TASVEG vegetation community codes into a set of general fire attributes categories (Table 2). Omitting 'Water' and 'Non-vegetated', there are 22 fire-attributes categories. Our aims for this theme were:

- To have as few categories as possible, to make the visual interpretation of printed and electronic maps easier;
- To use category names which are widely used and recognised by land and fire managers to describe Tasmanian vegetation;

- Within the constraints of the above, as far as possible to identify broad similarities in Tasmanian vegetation in terms of ecological fire sensitivity and flammability.

Fire sensitivity

Criteria for fire sensitivity (second column of Table 3) were developed as an objective guide for coding each TASVEG vegetation community. The terms *low*, *moderate*, *high*, *very high* and *extreme* were chosen for the classes because they are already used by fire managers in determining fire control potential in forest (McArthur 1967; McArthur 1973), grasslands (Cheney and Sullivan 1997) and buttongrass moorland (Marsden-Smedley *et al.* 1999).

The fire-sensitivity classes are based on the potential ecological impact of a single fire on a stand of vegetation. The recovery time from fire is a key ecological factor and this time interval increases from the low to extreme categories (Table 3). The fire sensitivity class which we assigned to each vegetation community in the list is an estimate based on our general knowledge of the vital attributes of the common plant species (see Noble and Slatyer 1980; Whelan *et al*. 2002) or, in a few cases, on published literature (e.g. Noble and Slatyer 1981).

Flammability

Criteria for flammability (second column of Table 4) were developed as an objective guide for coding each TASVEG vegetation community. The class names are the same as those for fire sensitivity except that only four classes are used: *low*, *moderate*, *high* and *very high*. The general principle applied is the ability of the vegetation to burn throughout the year; that is, on how many days per year that this vegetation type will burn. The fire flammability class which we assigned to each TASVEG vegetation community is an estimate based mostly on our general knowledge of the dynamics of fuel dryness for that vegetation type, but also on published research for buttongrass moorland (Marsden-Smedley and Catchpole 2001; Marsden-Smedley *et al*. 2001).

The three fire themes

Table 1 is a list of all of the TASVEG communities and the fire-attributes category, fire sensitivity class and flammability class assigned to each. The following discussion about each of the three fire themes gives the rationale for some of the classification decisions made.

Fire-attributes category

Table 2 shows the 24 categories developed, based on the fire attributes of TASVEG communities. Excluding the three that were not rated, twelve of the fire-attributes categories contain only a single combination of fire sensitivity and flammability classes. The remaining nine fire-attributes categories contain two (or in one case three) classes of fire sensitivity or flammability. Thus, the fire sensitivity and flammability characteristics are very similar for the majority but not for all fire-attributes categories.

The degree of amalgamation of TASVEG communities will always be arbitrary in any procedure that aims to simplify that complex classification, and the number of fire-attributes categories chosen could have been smaller or larger. The categories that include more than one fire sensitivity or flammability class have other intrinsic merit for fire managers. For example, 'dry sclerophyll forest' is a name widely used and therefore a fire manager will have a reasonable idea of what is possible in terms of fire behaviour, fire suppression strategies and prescribed burning. Twenty-four of the 28 TASVEG communities in the dry sclerophyll forest group have low fire sensitivity and high flammability, but the four exceptions did not warrant separation because of the small total area they cover. The same reasoning was applied when including 'seabird rookery complex' in 'heathland'.

Several fire-attributes categories were split from a larger grouping because they contain extremely fire sensitive vegetation that should be afforded the highest priority for protection from wildfire ['alpine and subalpine heathland with conifers and/or deciduous beech' (Ac) and 'rainforest with conifers and/or deciduous beech' (Rc), Table 2], or because they require special consideration in the planning of prescribed burning ('Sphagnum', Sp, Table 2).

Fire sensitivity

Column two of Table 3 describes the criteria used to classify the TASVEG communities into five categories of fire sensitivity.

Some of our classification decisions could no doubt be debated but, as yet, there has been no systematic attempt to identify the vital attributes (Noble and Slatyer 1980) of all but a few Tasmanian vegetation communities. This approach has been applied in Victoria, where values for 'minimum tolerable fire interval' and 'maximum tolerable fire interval' have been determined for ecological vegetation classes, based on the vital attributes of component species (Fire Ecology Working Group 2002). Our fire sensitivity classification would be considerably improved if a similar study on vital attributes were undertaken in Tasmania.

Some TASVEG vegetation types are easy to assign to fire sensitivity classes (e.g. '*Lagarostrobos franklinii* rainforest and scrub', 'lowland *Themeda triandra* grassland') because they are clearly at distinct ends of the spectrum of fire sensitivity, but classifying many communities is less straightforward. *Eucalyptus perriniana* and *E. morrisbyi* forest and woodland were classified as extreme fire sensitivity because they are threatened species that are only known from five small stands (Williams and Potts 1996). While the vital attributes of these two species may suggest that they are adapted to fire (i.e. they resprout from lignotubers after fire), a single fire event, particularly of high intensity, could have a significant impact on the total population of these species in Tasmania. Thus, these stands deserve special consideration during fire suppression operations.

With the exception of forest plantations, no economic assets are identified. The ecological impact of a wildfire is the factor underpinning the fire sensitivity classification. Structural and agricultural assets, including pasture, crops and orchards, are certainly a high priority for fire suppression. However, these assets must be identified from other sources because they are grouped together as one mapping unit, called 'agricultural land' in TASVEG, that is here included in the low fire sensitivity category. Forest plantations were included in the extreme fire sensitivity category because they are a distinct mapping unit in TASVEG and because they are clearly identified assets which are destroyed by fire.

The fire sensitivity classes of very high and extreme will be useful for identifying, on an ecological basis, vegetation which should be given the highest priority for fire suppression (e.g. rainforest and native conifers). Conversely, the fire sensitivity classes can also be used as a decision-making tool to determine if ecological burning or fuel reduction burning is appropriate for areas of vegetation. However, the fire sensitivity classes are a guide to management derived from only one facet of ecology; namely, the fire regime to which that general category of vegetation is adapted. At the local scale, individual species, particularly threatened species, may need to be considered, especially if vegetation is recently or frequently burnt.

Flammability

Column 2 of Table 4 describes the criteria used to classify the TASVEG communities into the four flammability classes. Pasture (mapped as 'agricultural land') was classified as moderate flammability, although the dynamics of availability to burn are different from the native communities in that class. Pasture in Tasmania cures and becomes flammable at some stage from December to February each fire season, depending on summer rainfall that is highly variable in extent and timing from year to year. Pasture is highly flammable once it is fully cured, except after recent rain (Cheney and Sullivan 1997).

The TASVEG vegetation mapping unit 'weed infestation' was classified as very high flammability because much of this vegetation type is gorse (*Ulex europaeus*) in the Midlands, Derwent and Fingal valleys, or marram grass (*Ammophila arenaria*) in coastal areas. Gorse has flammability similar to heathland, while marram grass has flammability similar to cured grassland.

Even vegetation types in the low flammability class (e.g. rainforest) can burn with enormous intensity on rare occasions. Recently burnt vegetation of types which we have classified as low or moderate flammability (e.g. wet eucalypt forest, rainforest) may have a higher availability for burning for many years after the initial build-up of fuels because of the increased exposure of the understorey to insolation or the changed floristics in the period immediately after the fire (Barker 1991). Cut-over and recently cleared vegetation is identified in the TASVEG coding, but the classification in this paper is based only on the major vegetation communities. The flammability of recently logged or cleared vegetation will therefore often be higher than the flammability codes assigned here would indicate.

Urban areas were not rated for flammability, but a wildfire may spread through some built-up areas under extreme fire weather conditions, as witnessed in Canberra in 2003 (McLeod 2003).

Final comments

The codes assigned here for fire sensitivity and flammability are intended to provide general guidance only. This is a 'broad-brush' approach involving a considerable simplification of the real world of vegetation at the landscape scale. More specific local knowledge will always provide better input to informed decision-making and should be used whenever possible.

Timing is an extremely important factor in determining the long-term ecological impact of a wildfire. For example, a wildfire that burns a stand of wet eucalypt forest that was burnt 10 years previously may cause a long-term change of species that would not occur on burning a 200-year-old stand. On the other hand, a wildfire in early spring is unlikely to have any impact on wet eucalypt forest because the forest will be too wet to burn, although other vegetation communities may burn at that time. A short time since fire may be significant for a young wet eucalypt forest, but one short inter-fire interval will probably have only a small impact on a dry eucalypt forest that has had a previous history of varied inter-fire intervals (see Watson and Wardell-Johnson 2004). Thus, the codes are static, and information on fire history and fuel dryness of a site will greatly enhance their usefulness. We look forward to a GIS that reflects real-time fire sensitivity and flammability in the landscape, with daily updates of fire history and fuel dryness.

Finally, each wildfire has a unique set of associated conditions. These will include the weather, the dryness of the fuels, the availability of fire-fighting resources, access to the fire, and the 'mix' of competing assets for which priorities for protection must be assigned. It will not always be possible to protect even the most fire-sensitive classes of vegetation. For example, the protection of human life has to take precedence, the vegetation may be burning too intensely for safe or effective fire suppression, and/or adequate resources may not be available.

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Table 1. Fire-attributes category, fire sensitivity and flammability codes for TASVEG communities, listed in decreasing order of fire sensitivity. (F-A Cat = fire-attributes category, FS = fire sensitivity, Fl = flammability; for fire-attributes category codes, see Table 2; fire sensitivity and flammability codes—E = extreme, VH = very high, H = high, M= moderate, L = low, N = not rated)

TASVEG community	F-A Cat	FS	Fl
Alpine coniferous heathland	Ac	E	M
Athrotaxis cupressoides open woodland	Ac	E	M
Athrotaxis cupressoides rainforest	Ac	E	L
Athrotaxis cupressoides – Nothofagus gunnii short rainforest	Ac	E	L
Athrotaxis selaginoides – Nothofagus gunnii short rainforest	Rc	E	L
Athrotaxis selaginoides rainforest	Rc	E	L
Athrotaxis selaginoides subalpine scrub	Ac	E	M
Eucalyptus morrisbyi forest and woodland	Df	E	H
Eucalyptus perriniana forest and woodland	Df	E	H
Highland rainforest scrub with dead *Athrotaxis selaginoides*	Rc	E	L
Lagarostrobos franklinii rainforest and scrub	Rc	E	L
Nothofagus gunnii rainforest and scrub	Ac	E	L
Plantations for silviculture	Sr	E	M
Callitris rhomboidea forest	Df	VH	M
Coastal rainforest	Rf	VH	L
Cushion moorland	As	VH	L
Eastern alpine heathland	As	VH	M
Eastern alpine vegetation (undifferentiated)	As	VH	M
Eucalyptus delegatensis forest over rainforest	Mf	VH	M
Eucalyptus globulus King Island forest	Mf	VH	M
Eucalyptus nitida forest over rainforest	Mf	VH	M
Eucalyptus obliqua forest over rainforest	Mf	VH	M
Highland low rainforest and scrub	Rf	VH	L
Leptospermum with rainforest scrub	Rf	VH	L
Melaleuca ericifolia swamp forest	Mf	VH	L
Nothofagus – Atherosperma rainforest	Rf	VH	L
Nothofagus – Leptospermum short rainforest	Rf	VH	L
Nothofagus – Phyllocladus short rainforest	Rf	VH	L
Seabird rookery complex	Hh	VH	H
Western alpine heathland	As	VH	M
Acacia dealbata forest	Wf	H	M
Acacia melanoxylon forest on rises	Wf	H	M
Acacia melanoxylon swamp forest	Wf	H	M
Broadleaf scrub	Wf	H	M
Eucalyptus brookeriana wet forest	Wf	H	M
Eucalyptus coccifera forest and woodland	Wf	H	M
Eucalyptus cordata forest	Wf	H	M
Eucalyptus dalrympleana – Eucalyptus pauciflora forest and woodland	Wf	H	M
Eucalyptus dalrympleana forest	Wf	H	M
Eucalyptus delegatensis forest over *Leptospermum*	Wf	H	M
Eucalyptus delegatensis forest with broad-leaf shrubs	Wf	H	M
Eucalyptus delegatensis wet forest (undifferentiated)	Wf	H	M
Eucalyptus gunnii woodland	Wd	H	M
Eucalyptus nitida forest over *Leptospermum*	Wf	H	M
Eucalyptus nitida wet forest (undifferentiated)	Wf	H	M
Eucalyptus obliqua forest over *Leptospermum*	Wf	H	M
Eucalyptus obliqua forest with broad-leaf shrubs	Wf	H	M
Eucalyptus obliqua wet forest (undifferentiated)	Wf	H	M
Eucalyptus regnans forest	Wf	H	M
Eucalyptus subcrenulata forest and woodland	Wf	H	M

Table 1. Continued.

TASVEG community	F-A Cat	FS	Fl
Eucalyptus viminalis wet forest	Wf	H	M
Leptospermum lanigerum – Melaleuca squarrosa swamp forest	Wf	H	M
Rainforest fernland	Rf	H	L
Riparian scrub	Ws	H	M
Sphagnum peatland	Sp	H	L
Acacia longifolia coastal scrub	Ds	M	M
Banksia marginata wet scrub	Ws	M	H
Coastal scrub	Ds	M	H
Coastal scrub on alkaline sands	Ds	M	H
Eastern alpine sedgeland	Ag	M	H
Eucalyptus amygdalina – Eucalyptus obliqua damp sclerophyll forest	Dp	M	M
Eucalyptus pauciflora forest and woodland not on dolerite	Dp	M	M
Eucalyptus pauciflora forest and woodland on dolerite	Dp	M	M
Highland grassy sedgeland	Ag	M	H
Highland *Poa* grassland	Ag	M	H
King Island eucalypt woodland	Dp	M	M
Leptospermum forest	Ws	M	H
Leptospermum scoparium – Acacia mucronata forest	Ws	M	H
Leptospermum scrub	Ws	M	H
Melaleuca squarrosa scrub	Ws	M	H
Notelaea – Pomaderris – Beyeria forest	Dp	M	M
Queenstown regrowth mosaic	Ws	M	H
Scrub complex on King Island	Ws	M	H
Subalpine *Diplarrena latifolia* rushland	As	M	M
Subalpine heathland	As	M	M
Subalpine *Leptospermum nitidum* woodland	As	M	M
Western alpine sedgeland/herbland	Ag	M	H
Western subalpine scrub	As	M	M
Western wet scrub	Ws	M	H
Agricultural land	Pt	L	M
Alkaline pans	Bs	L	VH
Allocasuarina littoralis forest	Df	L	H
Allocasuarina verticillata forest	Df	L	M
Banksia serrata woodland	Ws	L	H
Bursaria – Acacia woodland and scrub	Ds	L	H
Buttongrass moorland (undifferentiated)	Bs	L	VH
Buttongrass moorland with emergent shrubs	Bs	L	VH
Coastal complex on King Island	Hh	L	H
Coastal grass and herbfield	Gr	L	H
Coastal heathland	Hh	L	VH
Dry scrub	Ds	L	H
Eastern buttongrass moorland	Bs	L	VH
Eucalyptus amygdalina coastal forest and woodland	Df	L	H
Eucalyptus amygdalina forest and woodland on dolerite	Df	L	H
Eucalyptus amygdalina forest and woodland on sandstone	Df	L	H
Eucalyptus amygdalina inland forest and woodland (undifferentiated)	Df	L	H
Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits	Df	L	H
Eucalyptus barberi forest and woodland	Df	L	H
Eucalyptus delegatensis dry forest and woodland	Df	L	H
Eucalyptus globulus dry forest and woodland	Df	L	H
Eucalyptus nitida dry forest and woodland	Df	L	H
Eucalyptus nitida Furneaux forest	Df	L	H

Table 1. Continued.

TASVEG community	F-A Cat	FS	Fl
Eucalyptus obliqua dry forest and woodland	Df	L	H
Eucalyptus ovata forest and woodland	Df	L	H
Eucalyptus ovata heathy woodland	Dd	L	H
Eucalyptus pulchella forest and woodland	Df	L	H
Eucalyptus risdonii forest and woodland	Df	L	H
Eucalyptus rodwayi forest and woodland	Df	L	H
Eucalyptus sieberi forest and woodland not on granite	Df	L	H
Eucalyptus sieberi forest and woodland on granite	Df	L	H
Eucalyptus tenuiramis forest and woodland on dolerite	Df	L	H
Eucalyptus tenuiramis forest and woodland on granite	Df	L	H
Eucalyptus tenuiramis forest and woodland on sediments	Df	L	H
Eucalyptus viminalis – Eucalyptus globulus coastal forest and woodland	Df	L	H
Eucalyptus viminalis Furneaux forest and woodland	Df	L	H
Eucalyptus viminalis grassy forest and woodland	Df	L	H
Eucalyptus viminalis shrubby/heathy woodland	Dd	L	H
Freshwater aquatic herbland	Wl	L	L
Freshwater aquatic sedgeland and rushland	Wl	L	H
Heathland on calcarenite	Hh	L	VH
Heathland on granite	Hh	L	VH
Heathland scrub complex at Wingaroo	Hh	L	VH
Heathland scrub mosaic on Flinders Island	Ds	L	VH
Inland heathland (undifferentiated)	Hh	L	VH
Lacustrine herbland	Wl	L	L
Lowland grassland complex	Gr	L	H
Lowland *Poa labillardierei* grassland	Gr	L	H
Lowland sedgy grassland	Gr	L	H
Lowland sedgy heathland	Hh	L	VH
Lowland *Themeda triandra* grassland	Gr	L	H
Melaleuca pustulata scrub	Ds	L	H
Melaleuca squamea heathland	Ws	L	H
Midlands woodland complex	Dd	L	H
Pteridium esculentum fernland	We	L	VH
Pure buttongrass moorland	Bs	L	VH
Regenerating cleared land	Pt	L	M
Restionaceae rushland	Bs	L	VH
Saline aquatic herbland	Wl	L	L
Saline grassland	Wl	L	L
Saltmarsh (undifferentiated)	Wl	L	L
Sparse buttongrass moorland on slopes	Bs	L	VH
Spartina marshland	Wl	L	L
Succulent saline herbland	Wl	L	L
Weed infestation	We	L	VH
Western buttongrass moorland	Bs	L	VH
Western lowland sedgeland	Bs	L	VH
Wet heathland	Hh	L	VH
Wetland (undifferentiated)	Wl	L	L
Extra-urban miscellaneous	Zz	N	N
Permanent easement	Zz	N	N
Lichen lithosere	Zz	N	N
Sand, mud	Zz	N	N
Urban areas	Ub	N	N
Water, sea	Wt	N	N

Table 2. Tasmanian vegetation categories based on similar fire attributes. (FS = fire sensitivity, Fl = flammability; fire sensitivity and flammability codes—E = extreme, VH = very high, H = high, M= moderate, L = low, N = not rated; see Tables 3 and 4 for explanation of codes)

Code	Fire-attributes category	FS	Fl
Ac	Alpine and subalpine heathland with conifers and/or deciduous beech	E	L, M
Ag	Alpine and subalpine sedgy and grassy	M	H
As	Alpine and subalpine heathland without conifers or deciduous beech	M, VH	L, M
Bs	Buttongrass moorland	L	VH
Dd	Dry sclerophyll woodland	L	H
Df	Dry sclerophyll forest	L, VH, E	M, H
Dp	Damp sclerophyll forest	M	M
Ds	Dry scrub and coastal scrub	L	H, VH
Gr	Native grassland	L	H
Hh	Heathland	L, VH	H, VH
Mf	Mixed forest	VH	L, M
Pt	Agricultural land and miscellaneous types	L	M
Rc	Rainforest with conifers and/or deciduous beech	E	L
Rf	Rainforest without conifers or deciduous beech	H, VH	L
Sp	Sphagnum	H	L
Sr	Plantation	E	M
Ub	Urban and built-up areas	N	N
Wd	Wet sclerophyll woodland	H	M
We	Flammable weeds* and bracken	L	VH
Wf	Wet sclerophyll forest	H	M
Wl	Swamp and wetland	L	L, H
Ws	Wet scrub	L, M	H
Wt	Water	N	N
Zz	Non-vegetated	N	N

* Assumed to be gorse or marram grass (see text)

Table 3. Fire sensitivity (FS) classification of Tasmanian vegetation.

FS	Criteria for ecological impact of wildfire	Appropriate fire intervals	Fire-attributes categories	Management recommendations
Extreme	Any fire will cause either irreversible or very long-term (> 500 years) damage.	No fire	Alpine and subalpine heathland with conifers and/or deciduous beech; plantation; rainforest with conifers and/or deciduous beech	Suppress all fire. Highest priority for suppression.
Very high	A single fire will cause significant change to community structure for 50–100 years and will increase the probability of subsequent fires changing the community more permanently.	100+ yr	Alpine and subalpine heathland without conifers or deciduous beech[1]; mixed forest; rainforest without conifers or deciduous beech[2]	Suppress all fire. High priority for suppression.
High	A fire-adapted community requiring at least 30 years between fires to maintain the defining species. Fire intervals greater than 80 years are required to reach mature stand structure.	30–300 yr	*Sphagnum*; wet sclerophyll forest; wet sclerophyll woodland	Suppress all fire, but give higher priority to stands burnt less than 80 years ago.
Moderate	A fire-adapted community requiring at least 15 years between fires to maintain the defining species.	15–100 yr	Alpine and subalpine heathland without conifers or deciduous beech[1]; alpine and subalpine sedgy and grassy; damp sclerophyll forest; wet scrub[2]	Suppress fires in stands burnt less than 20 years ago.
Low	Highly fire-adapted or non-native vegetation. A single fire will generally not affect biodiversity, although repeated short intervals (i.e. < 10 years) may cause long-term changes.	3–50 yr	Agricultural land and miscellaneous types; buttongrass moorland; dry sclerophyll forest[2]; dry sclerophyll woodland; dry scrub and coastal scrub; flammable weeds and bracken; heathland[2]; native grassland; swamp and wetland	Suppression usually not an ecological priority except in specific situations (e.g. a recently burnt stand of a threatened species).

[1] This fire-attributes category has four TASVEG communities classified moderate and four classified very high fire sensitivity (see Table 1).

[2] Most of the TASVEG communities grouped in this fire-attributes category have this fire sensitivity classification. Exceptions are not indicated here but can be determined from Table 1.

Table 4. Flammability classification of Tasmanian vegetation.

Flammability	Criteria for flammability	Fire-attributes categories
Very high	Will burn readily throughout the year even under mild weather conditions, except after recent rain (i.e. less than 2–7 days ago).	Buttongrass moorland; flammable weeds and bracken; heathland[1]
High	Will burn readily when fuels are dry enough but will be too moist to burn for lengthy periods, particularly in winter. Fuels will be dry enough to burn on most days from late spring to early autumn.	Alpine and subalpine sedgy and grassy; dry sclerophyll forest[1]; dry sclerophyll woodland; dry scrub and coastal scrub[1]; native grassland; wet scrub
Moderate	Extended periods without rain (i.e. two weeks at least) and/or moderate or stronger winds are required for these communities to burn.	Agricultural land and miscellaneous types; alpine and sub-alpine heathland with conifers and/or deciduous beech[2]; alpine and subalpine heathland without conifers or deciduous beech[1]; damp sclerophyll forest; mixed forest[1]; plantation; wet sclerophyll forest; wet sclerophyll woodland
Low	These communities will burn only after extended drought (i.e. four weeks without rain) and/or under severe fire weather conditions (i.e. forest fire danger rating > 40).	Alpine and subalpine heathland with conifers and/or deciduous beech[2]; rainforest with conifers and/or deciduous beech; rainforest without conifers or deciduous beech; sphagnum; swamp and wetland[1]

[1] Most of the TASVEG communities grouped in this fire-attributes category have this flammability classification. Exceptions are not indicated here but can be determined from Table 1.

[2] This fire-attributes category has three TASVEG communities classified moderate and three classified low flammability (see Table 1).

Note: recently burnt stands of low or moderate flammability classes may have a higher flammability rating.

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