PUBLIC ATTITUDES TO FIRE

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SUMMARY

For most people many of the effects of fire are seen as detrimental to the environment. This attitude is inconsistent with the fact that fire is itself an ancient part of that environment. Very few people ever consider the effects of other factors of the environment on fire.

The origins of this modern imbalance between attitudes and ecology may be related to the concepts of "property" and "damage" which were probably foreign to the pre-existing hunter-gatherer societies.

Changing public attitudes to ecologically sound fire management requires the separation of the legitimate from the unwarranted concerns and this is helped by careful choice of words that are always used in the same way by all fire managers.

INTRODUCTION

Managers of public land should be responsive to public attitudes about their management and explain apparent anomolies. Fire managers of such lands have a particularly difficult task where public attitudes to fire and planned burning are at odds with ecologically sound fire management.

This paper discusses some questions about fire, planned burning and the origins of fire attitudes, and suggests ways of making those attitudes more consistent with the ecology of our fire-adapted vegetation types.

What are the Effects of Fire on Natural Ecosystems?

The usual responses to this question include such things as atmospheric pollution, soil erosion, nutrient losses, eutrophication of water, destruction of soil organic matter and microorganisms, damage to plants, reduction of habitat, and death of wildlife. The words "pollution", "erosion", "destruction", "damage", "reduction" and "death" appear to judge fire's effects as negative from a human point of view. However, fire and recognisably modern vegetation types have existed for at least five million years (Kemp 1981) and fossil pollen and charcoal evidence suggest that fire, vegetation, climate and people were in equilibrium for more than three thousand years before Europeans came to Australia (eg see Figure 2 in Macphail 1980). This equilibrium suggests that there should be many positive fire effects to balance the negative ones listed above. It also suggests that the question itself is biased if the object is to understand fire ecology. A better question might be:

What are the Interactions of Fire in Natural Ecosystems?

Table 1 attempts to list the important known interactions. They are arranged in "positive" and "negative" columns to indicate how they are commonly judged. However, from an ecosystem viewpoint all are neutral. Note that for every "negative" a "positive" can be found and that for nearly every effect of fire there is a reciprocal effect on fire.

Table 1
The interactions of fire in natural ecosystems

Ecosystem Factor	Effects OF Fire		Effects ON Fire	
	NEGATIVE	POSITIVE	NEGATIVE	POSITIVE
Atmosphere	Pollution	Recharge of atmospheric nutrients	Rain, wet air	Lightning, dry air, wind, temperature
Earth	Erosion	Rejuvenation	Down slopes, wet soils	Up slopes, dry soils
Nutrients	Loss	Increased availability	Minerals decrease flammability	Growth of fuel
Plants	Damage	Regeneration waste disposal	Young plants = fire breaks	Old plants = fuel
Micro-organisms	Death (especially fungi)	Regeneration (especially bacteria)	Good decomposition	Poor decomposition
Water	Eutrophication	Increased runoff	Extinguishes (present water)	Better growth of fuel (past water)
Animals	Loss of habitat	Green pick	Eat fuel	(?)
Hunters and gatherers	Injury, (death)	Easier hunting Easier gathering	Suppression (?)	Ignition
Fire	Loss of fuel (different times)	Increased intensity (same time)	Loss of Fuel (different times)	Increased intensity (same time)
Time	-	-	Less fuel (less time)	More fuel (more time)

Where do Fire Attitudes Come From?

A society's attitudes to fire are probably determined by the balance between fire's values on the one hand and its dangers on the other. This balance changed as hunting and gathering was replaced by animal husbandry, agriculture and fixed dwellings. Table 2 examines some of the values and dangers of fire in relation to three societies. This information suggests that fire was a vital tool for hunters and gatherers and apart from children burning their fingers, posed no threat to

people or property because there was no property other than that which could be carried.

On the other hand the present city dwellers, who make up 80 per cent or more of our present population, have very little use for fire. However, their lives, immediate environment and nearly all their property are, every so often, severely threatened by it. "FIRE!" is one of the most alarming words in the language. It is used to wake people out of deep sleep and get them out of their flammable houses before their flammable clothes are ignited. Fire for most people is equated with danger, the devil and hell.

Between the two extremes are today's land managers. They are aware of fire's values as a tool but they are also aware of fire's dangers; not just to single dwellings but to whole settlements. It is this concern for life and property in general (and not just for themselves) that has led most managers of flammable native vegetation to use planned fuel reduction burning to prevent the undesirable effects of bushfires.

Table 2
The Values and Dangers of Fire

Value or Danger	Hunters and Gatherers	Modern land Managers	Modern city Dwellers
Warmth	Vital	Some	(mostly oil, gas and electricity)
Cooking	Vital	Some	(mostly oil, gas and electricity)
Rubbish disposal	?	Some	Some
Hunting	Vital	Some	Nil
Access	Important	Some	Nil
Regeneration, green pick	Vital	Vital	Nil
Fuel reduction	?	Vital	Nil
Injury	Some	Some	Some
Life threat	Slight	Serious *	Serious **
Property damage	Nil	Serious *	Serious **

* *Settlement fire* ** *House fire*

Does Fuel-reduction Burning Mitigate Bushfires?

The bottom half of Figure 1 (from Australian Forestry Council 1987) shows that within Western Australian forests the systematic fuel-reduction burning policy implemented after the Dwellingup fires does reduce bushfires. Not only are the areas burnt each year reduced but the system stood firm against cyclone "Alby" and all its fires - a much more serious combination than that which burnt Dwellingup.

The top of Figure 1 shows that Tasmania, with a similar sized forest resource and a similar fire pattern up to 1961 was unable to prevent the 1967 disaster which killed 62 people and destroyed 1 400 houses. It was only after three more bad years (1973, 1982 and 1983) that the need for systematic fuel-reduction burning of flammable vegetation types was accepted and it will be several years before it is fully operational.

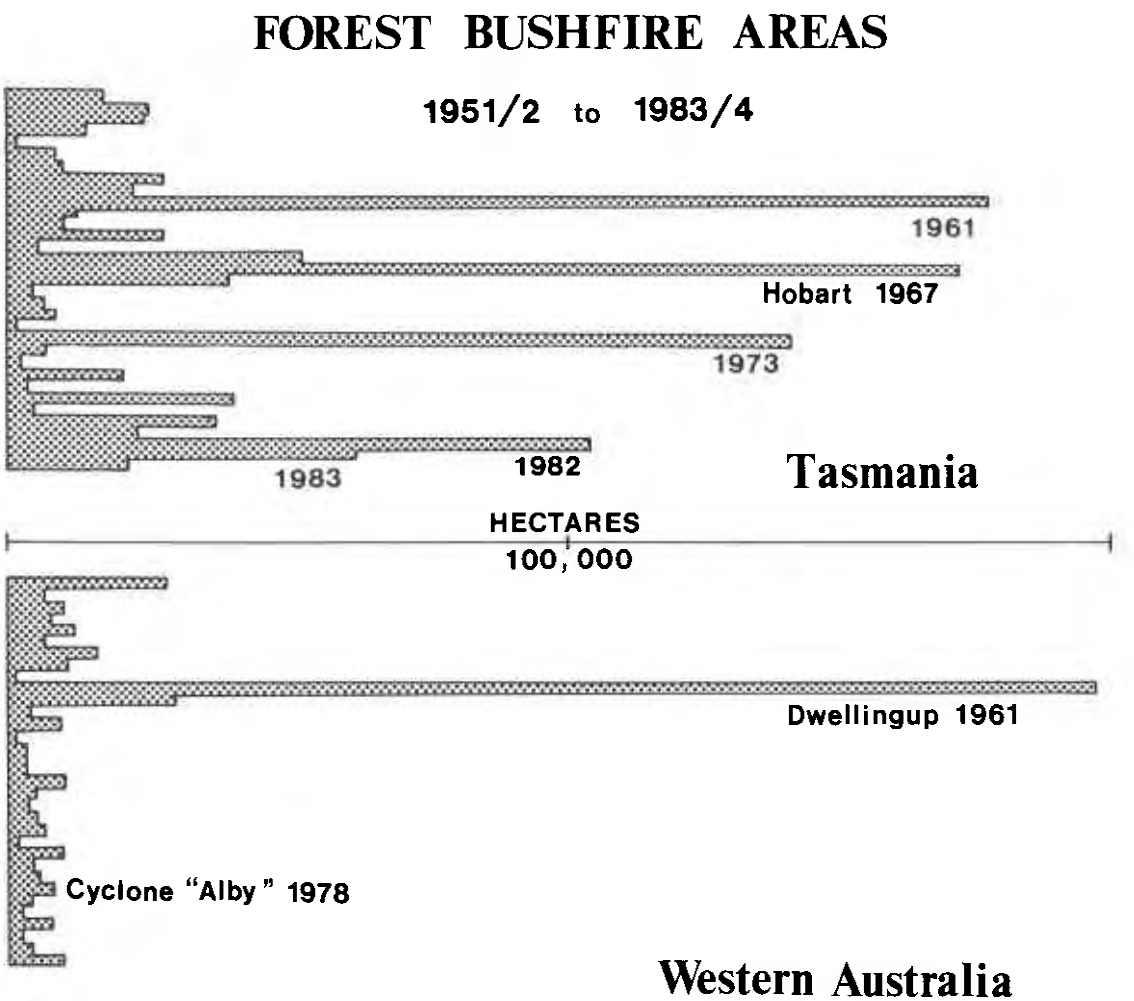

FIGURE 1

Why is Fuel-reduction Burning Opposed?

If the city-dwelling majority does indeed equate fire with danger then it may very well see those who use fire as dangerous. Those who have been to university or seen botanical text books are likely to have had any existing aversion to fire reinforced. This is because most of these books come from the USA and in nearly all of them the fire story and pictures come from the US Forest Service. Fire is presented as mostly ignited by people, as doing enormous damage and disturbing the supposedly natural "succession" to theoretical self-perpetuating "climax" vegetation types. (This standard version even appears in those texts that discuss lightning fires; that show that insects and disease account for far more damage than fire; and that have to invoke the self-contradictory term "fire climax" to reconcile observation and theory (eg Dasmann 1968).)

Which of the Common Concerns are Unwarranted?

Some of the concern about "unnatural" burning arises from the tradition of blaming the fire lighter for the fire size and damage. It fails to appreciate that in natural fuel accumulations the natural fire weather largely determines fire size, intensity, damage and difficulty of control. Although ignition timing and patterns also affect these factors, the ignition mechanism (matches, spark or lightning) does not.

Other concerns involve fire intensity and fire frequency. These may stem from the view that fire is something new in the environment. Once it is realised that the flammable vegetation types have probably fuelled and survived at least 100 000 fires since they evolved it will also be appreciated that the natural range in either fire frequency or intensity is unlikely to be extended by planned burning. However, there should be concern about any new factors in the environment that may interact with fire. These include introduced animals (eg rabbits, sheep), plants (eg gorse, annual grasses), fungi (eg *Phytophthora*), insects, chemicals and machines.

What Can Be Done about Public Attitudes?

(a) We should continue to use the word "fire" in its traditional role as an alarm, for bushfires and for general discussion of combustion, but avoid using it in connection with planned burning.

(b) We should use the term "burn" or "burning" whenever the ignition is planned and legal (eg "burning permit period") and the term "arson" or "incendiarism" for illegal use of fire.

(c) We should include fire education in high school curricula and make clear the distinction between bushfires and planned burning. We should show everybody how to visually estimate fuel quantities, explain just how helpless we are when a lot of fuel is alight on a bad day and how effective fuel reduction is in reducing bushfire damage.

(d) We should promote the balanced presentation of fire in botanical and land management courses at university, along the lines shown in the "background" section of "Australian Bushfire Research" (Australian Forestry Council 1987), at least until some truly Australian fire ecology text books are written.

(e) We should answer "Letters to the Editor" about fire with copies of "Australian Bushfire Research" and send a copy to the editor as well.

(f) We should explain that, unlike a house, fire-adapted vegetation cannot be "destroyed" by fire alone. It may be damaged but, unless prevented by some new factor, it will recover as it has always done before.

(g) We should quantify damage in dollars and add it to the fire-fighting bill and to the income foregone because of the resources lost. The full costs of bushfires should be widely published and carefully compared with that of fuel-reduction burning. We should also quantify and publish the dollars saved by both fire-fighting and fuel-reduction burning.

(h) Recognising that there is currently more acceptance of fire-fighting than of planned burning, we should consider bringing some bushfires out to safe edges in the evening before the next bad fire day. This may require changing suppression objectives from minimum area burnt to minimum time alight. It may also require new ways of salvaging the few trees likely to be felled by such fires.

(i) We should recognise that, unlike most of our fuel-reduction burning, the percentage of area burnt by bushfires, when the soil was moist and the fire weather easy, was very small. We should check that our lighting patterns, burn sizes and seasons have pre-european equivalents.

(j) We should identify those who are interested in or critical of planned burns and ask them to help monitor both bushfire and planned burning effects.

(k) We should listen carefully to informed critics and share burning and bushfire problems with them.

(l) We should letterbox those who choose to live in "sylvan settings" and offer advice on how to reduce their fire risks.

(m) We should explain fire ecology to visitors to National Parks along the lines shown in Tables 1 and 2 above and in "Australian Bushfire Research".

(n) We should explain that the plants and animals present today have survived more than 40 000 years of human ignition and that in some places where this has ceased, some animals have become extinct and some forests have died. To arrest these problems we need to integrate those ancient burning practices with the protection of modern values and property.

(o) We should run courses in fire for journalists and explain how, with their help, the Hobart and Ash Wednesday disasters need never happen again. We should ask them to report the dedication and skill of those who keep fuels low just as much as they now praise the occasional heroics required wherever such fuels are allowed to accumulate. Both stories can have the human touch. We should ask them to help remove the current impression that heroes fight and only villains light. Are not the true heroes those who do the right thing when all about them say "nay"?

CONCLUSION

As managers of public land in Australia we need to find out which people are concerned about fire and what those concerns are. We need to understand their main sources of information about fire and to recognise gaps and misinformation. From this base we can diminish unwarranted concerns about planned burning and respond quickly to valid ones.

We need to be much more rigorous in fire research and in the editing and refereeing of fire research papers. We should discredit the narrow philosophy that fire is just "a disturbance factor", and instead, promote its role as an ancient and integral part of most Australian ecosystems. We should try to supply balanced information to all those interested in fire and planned burning.

We should generate debate about "blame" or responsibility for bushfire's effects and make sure that those who own the fuel receive at least as much attention as those who irresponsibly or maliciously ignite it.

We have ahead of us a major task to make public attitudes to fire more consistent with the facts of fire ecology. The prize is public support for those actions that will not only prevent future settlement holocausts but also take care of our fire-adapted plants and animals.

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