

A FIRE HAZARD INDEX ANALYSIS SYSTEM FOR FOREST AREAS
IN WESTERN AUSTRALIA. MARK I.

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Introduction

The fire proneness of the forest region of south-west Western Australia is well documented and well appreciated. The potentially destructive nature of wildfires and the high costs associated with their suppression is similarly appreciated. Currently,, the cornerstone to minimising the impact of wildfires is to prevent fuels from building up to "dangerous" levels. This has been achieved by an extensive programme of rotational fuel reduction burning. There can be little doubt that fuel reduction burning has contributed significantly to the control of wildfires and to reducing their damage potential. In Western Australia, the Department of Conservation and Land Management annually prescribe burns in the order of 250 000 hectares of State Forest at a cost of around \$2 million. Throughout much of the prescribed burning "season", which is normally 3 - 5 months, many staff, wages employees and resources are committed to fuel reduction burning. The Department of C.A.L.M. is expected to maintain prescribed burning programmes as well as cope with an ever increasing work load in many areas of forest and land management. Unfortunately, increases in

money, personnel and other resources have not kept pace with the demands placed on the Department. It is essential, therefore, that operations such as prescribed burning are critically reviewed to insure that every dollar is spent most effectively. It may also be necessary to rationalise the existing prescribed burning programme to enable realistic goals to be set and to enable other, important works programmes to be maintained. Due to money constraints, the days of burning all forest blocks on a 5 - 7 year rotation are drawing to a close. There are other areas outside the forest belt which require attention in terms of wildfire protection. Diminishing resources and increasing demands make it imperative that we revise our standards and identify those forest areas which are in most need of wildfire protection. Other areas may have to be neglected or given less emphasis.

Here, I propose a system for rating the hazard posed by a wildfire burning under a fire danger rating in excess of HIGH (i.e. a FDI in excess of around 140). The hazard rating system allocates weighted values to various attributes and environmental factors which I consider to be valuable, important and which may be destroyed, threatened or in some way diminished by fire. The system also allows a weighting for suppression difficulty and the hazard to fire fighters.

The Hazard Rating System

A hazard index is calculated by adding up all indice values according to the appropriate response (below). All 10 factors must be considered and a rating chosen in each situation, I am questioning the status of a land unit. The level of resolution may be as little as 2 hectares, or an F.M.I.S. grid cell. If more than one condition of A, B, C etc. applies in any Factor, then each case is tallied. The final tally equals the hazard index (HI). This value can then be mapped using F.M.I.S. Areas of high and low hazard can be identified. Unlike other hazard rating systems, such as Preplan, this system does not attempt to calculate the hazard for a range of weather/fuel type combinations. It is not a fire danger rating system in the sense that it implies fire intensity of fire behaviour. Rather, this is a static system which attempts to determine what values may be at risk should the unit of land catch fire when the FDI exceeds 140. Obviously, the level of damage will be a function of fire intensity, but this can be calculated separately using existing techniques. This hazard rating system serves to identify land units which are valuable or potentially valuable and hence require some protection effort, or land units which if they burn, are hazardous to extinguish. If only one condition of a, B, C, etc. applies for each factor, then the maximum Hazard Index possible is 220. The following system will need some refinements and I seek your comments.

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VALUE

FACTOR 1: Life and Property at or Around Site

A: Within 3km of a township, settlement, or other community or facilities where people congregate or valuable public property.	100
B: Within 3 - 6km of A above.	30
C: Within 1km of private property especially farmland	15
D: Further than 6km of B above or further than 1km of C above.	5

FACTOR 2: Fuel Quantity at Site

A: Very heavy fuels >30t/ha	20
B: Heavy fuels 20 - 30t/ha	15
C: Moderate fuels 10 - 20t/ha	10
D: Light fuels 5 - 10t/ha	5
E: Very light fuels <5t/ha	2

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FACTOR 3: Fuel Type at Site

A: Flammable aerated logging slash, flats, heath, swamps or creeks, dense scrub, trash	20
B: Grass only	10
C: Litter or needles only	6
D: Other	3

FACTOR 4: Timber Values at or Around Site

A: Within 3km of high value plantation, fire sensitive hardwood regeneration <20 years, or any other area classified as a Red Action Zone	20
B: Within 3km of high value or high quality mature hardwood forest	10
C: Within 3km of production forest other than A or B	5
D: Other	2

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FACTOR 5: Other Forest Values at or Around Site

A: Within 3km of special values including water catchment, recreation area, landscape area, scientific area, ecologically important area of other special area (rate as perceived) Maximum 20

FACTOR 6: Accessibility to Site

A: Access difficult (heavily timbered, dense scrub, poor roading), steep slopes, creeks and gullies 20

B: Access moderate, moderately open forest, moderate scrub density, gentle slopes 10

C: Access easy, open country, flat, well roaded 3

FACTOR 7: Wildfire Detection Capability of Site

A: Poor - no spotter or tower coverage, sparsely populated 5

B: Fair - infrequent spotter coverage, few towers 3

C: Good - regular spotter coverage, good tower coverage 1

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VALUEFACTOR 8: Suppression Crew Travel Time (Heavy Duty) to Site

A: 2 - 3 hours	5
B: 1 - 2 hours	3
C: 0.5 - 1 hour	2
D: <0.5 hour	1

FACTOR 9: Ignition Risk (Historically) at Site

A: High (more than 3 wildfires since 1950)	5
B: Moderate (1 - 3 wildfires since 1950)	3
C: Low (no wildfires since 1950)	2

FACTOR 10: Dieback Impact of Site

A: High	5
B: Moderate	3
C: Low	1