Ecological Fire Management In Northeast Victoria

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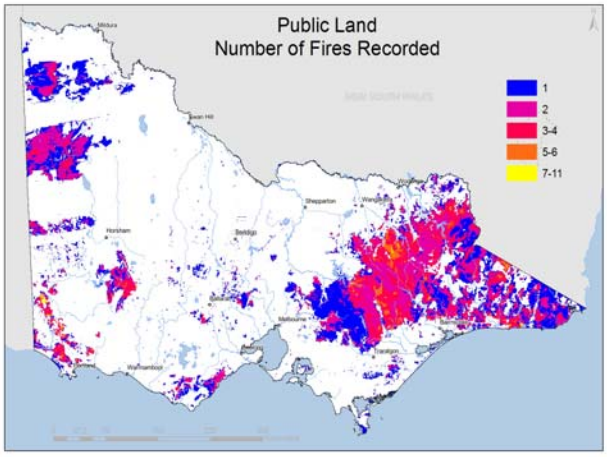

History to Date

- 1998: Organisational structure for fire ecology established
- 1999: Interim Guidelines and Procedures for Fire Ecology
- 1999 – 2003: "Disturbance" report; Initial fire ecology strategies; Practitioners Manual"
- 2003: Mallee and Alpine fires; Victorian Bushfire Inquiry
- 2004: Final Guidelines and Procedures for Ecological Burning
- 2004: Appointment of Fire and Environment Planning Officers
- 2005: Revised Code of Practice for Fire Management on Public Land; New fire ecology structures
- 2006: Fire Ecology Strategic Directions document
- 2006: Integrated Fire Management Planning process (whole of government, whole of landscape)

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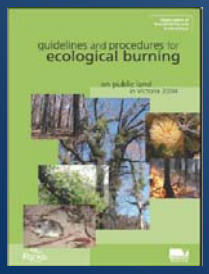
Guidelines and Procedures for Ecological Burning



Code of Practice for Fire Management on Public Land In Victoria

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Integrating Ecological Burn Planning in Victoria

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Ecological Fire Management Strategies

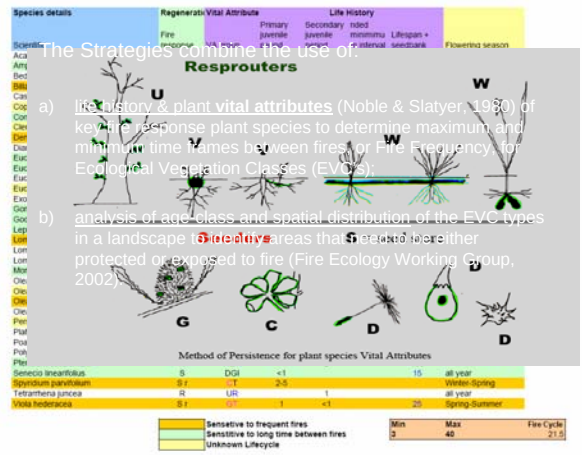
According to the revised (2006) Code of Practice (Section 2.2.2):

These strategies must

"address the appropriate use or exclusion of fire at a landscape scale"

They are to be used

"as a tool to achieve biodiversity conservation outcomes"



The Strategies combine the use of:

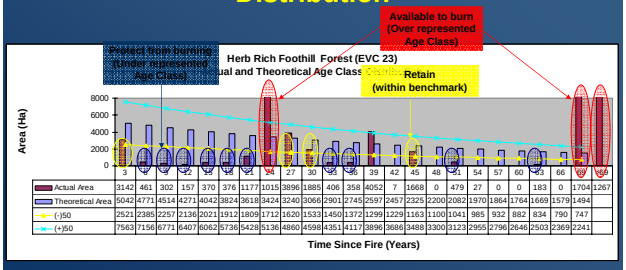
a) life history & plant **vital attributes** (Noble & Slatyer, 1980) of key fire response plant species to determine maximum and minimum time frames between fires or Fire Frequency for Ecological Vegetation Classes (EVCs);

b) analysis of age class and spatial distribution of the EVC types in a landscape to identify areas that are burnt or either protected or exposed to fire (Fire Ecology Working Group, 2002).

Tolerable Fire Intervals & Fire Cycles

EVC	EVC Description	Minimum Interfire Frequency	Maximum Interfire Frequency	Fire Cycle	Fire Response Category
16	Lowland Forest	8	50	30	Dependant
18	Riparian Forest	10	80	45	Influenced
20	Heathy Dry Forest	5	25	15	Dependant
22	Grassy Dry Forest	5	30	30	Influenced
23	Herb-rich Foothill Forest	10	60	35	Influenced
29	Damp Forest	15	80	47	Influenced
30	Wet Forest*	25	80	50	Sensitive
31	Cool Temperate Rainforest *	20	80	50	Sensitive
45	Shrubby Foothill Forest	5	40	22	Dependant
47	Valley Grassy Forest	10	80	40	Influenced
55	Plains Grassy Woodland	5	50	30	Influenced
56	Floodplain Riparian Woodland	10	80	45	Influenced
59	Riparian Thicket *	10	80	45	Sensitive
126	Swampy Riparian Complex *	10	80	45	Sensitive
902	Gully Woodland	10	50	35	Influenced

Actual & Theoretical Age-class Distribution



Theoretical Age Class Distribution

The theoretical distribution of age-classes:

- *Never likely to be achieved in reality,*
- *To be used as a guide for ecological burn planning*
- *Assist in determining areas suitable for burning or fire exclusion depending on variance from the theoretical values*

Average Annual & 3 Year Burn Target

EVC	Vegetation Type	Area (ha)	Min Interfire	Max Interfire	Fire Cycle	Annual Target (theoretical)	3yr Target (theoretical)	AV. Annual W/fire	AV. Annual P/ Burn Target	3yr Eco Burn Target
16	Lowland Forest	1073.64	8	50	30	35.79	107.36	4.39	31.40	94.19
18	Riparian Forest	6054.51	10	80	45	134.54	403.63	64.75	69.79	209.38
20	Heathy Dry Forest	4192.56	5	25	15	279.50	838.51	34.60	244.91	734.72
22	Grassy Dry Forest	11928.06	5	30	30	397.60	1192.81	85.29	312.31	936.93
23	Herb-rich Foothill Forest	58820.07	10	60	35	1680.57	5041.72	499.44	1181.13	3543.40
29	Damp Forest	30354.89	15	80	47	645.85	1937.55	326.95	318.90	956.69
45	Shrubby Foothill Forest	2284.57	5	40	22	103.84	311.53	24.50	79.35	238.04
47	Valley Grassy Forest	1859.44	10	80	40	46.49	139.46	7.67	38.81	116.44
55	Plains Grassy Woodland	999.40	5	50	30	33.31	99.94	3.84	29.47	88.42
56	Floodplain Riparian Woodland	646.17	10	80	45	14.36	43.08	0.41	13.95	41.85
902	Gully Woodland	485.12	10	50	35	13.86	41.58	6.33	7.54	22.61
									2327.56	6982.67

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Development of a Candidate Burn Map

Select Landscape Management Unit

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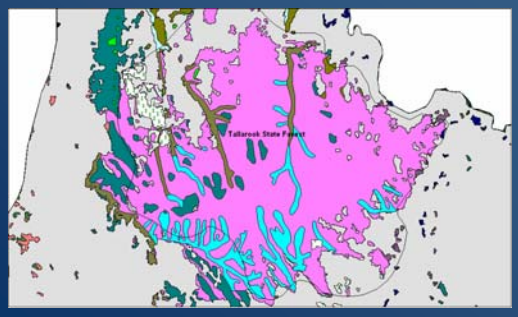
Overlay Ecological Vegetation Classes



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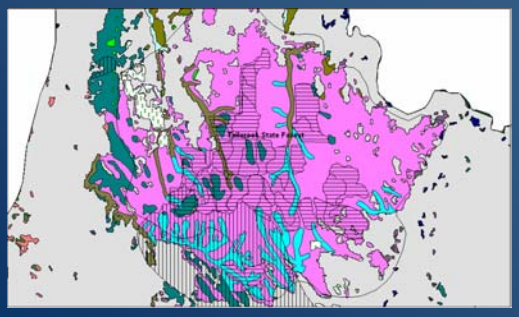
Overlay Fire History



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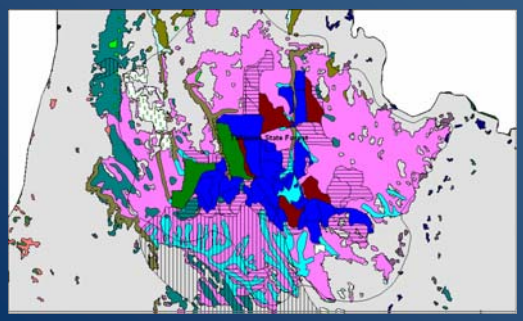
Overlay Logging History



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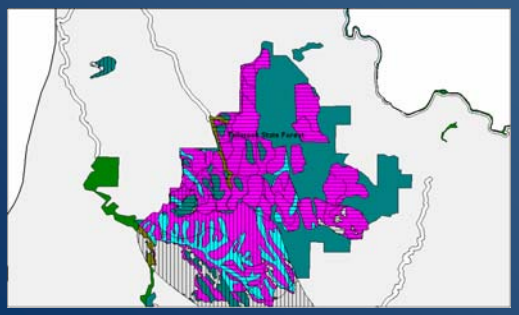
Actual EVC Age Class



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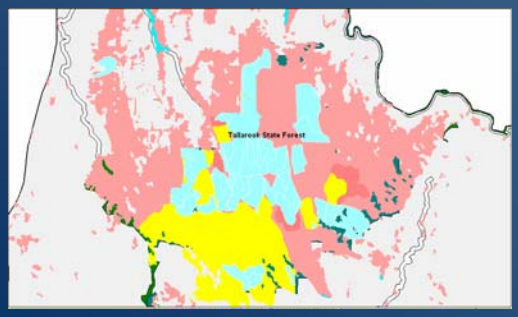
Candidate Burn Map



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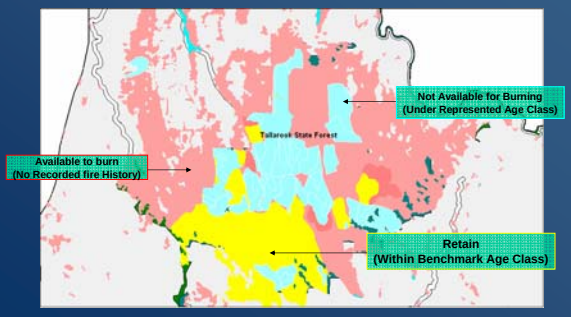
Candidate Burn Map



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Limitations in Determining EVC Fire Frequency

Determination process does not yet provide for:

- other EVC disturbance regimes (i.e. drought, flood or snow);
- changes in altitude, structural and/or EVC species composition across the LMU (we assume the EVC fire regime remains the same across the LMU); and
- information provided in fire response databases often conflicts or is absent for particular species.

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North-east Broad EVC Fire Response Categories

Development of EVC Fire Response Categories.

- Process first identified by the Fire Ecology Working Group in 2002.
- Involved assigning EVC's into 3 broad fire response categories.
- Current north-east fire response categories meet the global standard according to documents produced by the Nature Conservancy - Global Fire Initiative.

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Why categorise EVC's on their fire response?

- Fire can impact on EVCs differently according to their abiotic (non-living) & biotic (living) components. These need to be considered in our application of ecological fire.
- We need to target ecological burning based on the greatest need/urgency.

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Fire Dependent EVC's

EVC's where fire is an essential part of EVC maintenance and the benchmark / key fire response species have evolved adaptations to respond positively to fire and to facilitate fire spread (includes contributing to fuel – loads).

EVC 21 Shrubby Dry Forest

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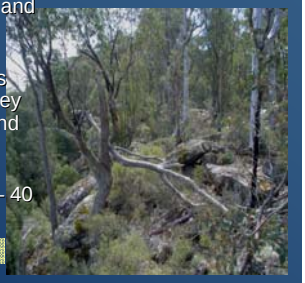
Fire Influenced EVC's

EVC's that lay within the transition zone between fire dependent and fire sensitive categories.

The EVC's in this fire response category contain plant species that are sensitive to fire but they also include plants that respond positively to fire.

An average fire cycle for this category occurs between 30 – 40 years.



EVC 28 Rocky Outcrop Shrubland

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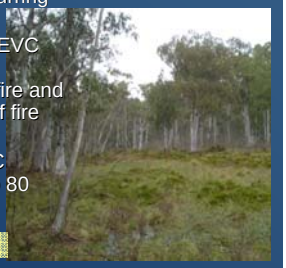
Fire Sensitive EVC's

Fire Sensitive EVC's have not evolved with fire as a significant re-occurring process.

Plant species existing within this EVC category lack adaptations to positively respond to frequent fire and species mortality is high even if fire intensity is low.

An average fire cycle for this EVC category occurs between 40 to 80 years.



EVC 40 Montane Riparian Woodland

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EVC Fire Response Categorisation Process

Fire Response Category	Deciding Factors for Inclusion in this Category
Fire Dependent	- Average EVC fire cycle = <29 years. - Species present in this EVC contribute to high fuel loads and/or fire spread. - Fire regime is the main disturbance regime.
Fire Influenced	- Average EVC fire cycle = 30 – 40 yr's . - Some EVC benchmark plant species response well to fire disturbance regimes. Other species rely on other types of disturbance regimes (flood, drought. - Tolerable fire frequencies vary greatly between plant species in these EVC types.
Fire Sensitive	- Average EVC fire cycle 40+ years. - The majority of native flora and/or fauna species existing within this EVC category lack adaptations to positively respond to frequent fire and of these species mortality is high even if fire intensity is low. - Low priority for ecological prescribe burning due to other disturbance regimes playing more important roles then fire.

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How are the broad categories used by Land & Fire Managers During Ecological Burn Planning?

- As a stop sign (Fire Sensitive EVC's).
- As a caution flag (Fire Influenced EVC's).
- As a green light to proceed to the next stage of burn planning (Fire Dependent EVC's).

Also,

- An easier way to describe the EVC fire regime.

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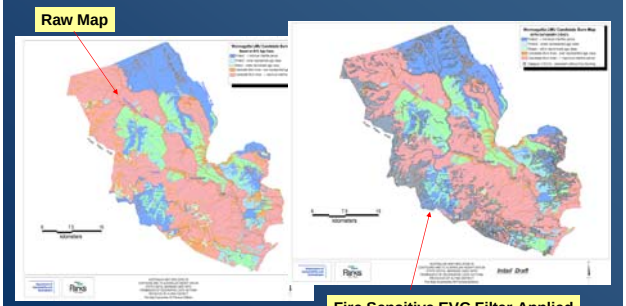
Effect on the Candidate Burn Map



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Conclusion

- On–ground application of ecological fire management is still a working process in north-eastern Victoria.
- As knowledge of fire and the environment increases so will our ability to accurately apply ecological fire across the landscape.
- The development of EVC fire response categories has enabled all land & fire managers to have a general understanding of EVC fire requirements.
- Future directions for improvement in the ecological planning process:
  - Fauna Vital attributes
  - Improved Fire Severity Mapping
  - Implementation of state fire ecology monitoring protocols.