

Principles and Objectives for Fire Management

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Towards Ecologically Sustainable Fire Management in a Global Biodiversity Hotspot

- Fire regimes for the conservation of biodiversity
- Risk analysis - threat to community values
- Continuous improvement





Key Principles of Fire Management

Principle 1

Vegetation and climate of most bioregions of WA make them highly prone to bushfire. Fire is a natural environmental factor that has & will continue to influence the nature of our landscapes so is integral to natural resource management



Key Principles of Fire Management

Principle 2

Species and communities vary in their adaptations to, reliance on and responses to fire. Knowledge of the way in which key organisms respond to fire regimes underpins the use of fire.



Key Principles of Fire Management

Principle 3

Other factors such as landform, topography, fragmentation and species life history attributes, and climatic events, often drive ecosystems towards a new transient state with respect to species composition & structure.



Key Principles of Fire Management

Principle 4

The killing power of a fire is proportional to its intensity & size. Fire management is required for two primary reasons:

- a) To conserve biodiversity*
- b) To reduce the impacts of large, damaging wildfires.*



Key Principles of Fire Management

Principle 5

Fire management should be precautionary & consider both ecological and protection objectives in order to optimise outcomes.



Key Principles of Fire Management

Principle 6

An interlocking mosaic of patches of vegetation representing a range of fire frequencies, intervals, seasons, intensities and scales will optimise the conservation of biodiversity at the landscape scale.



Key Principles of Fire Management

Principle 7

The scale of the fire-induced mosaic should;

- a) enable natal dispersal*
- b) optimise boundary habitat*
- c) optimise connectivity*
- d) minimise opportunities for threatening processes*



Key Principles of Fire Management

Principle 8

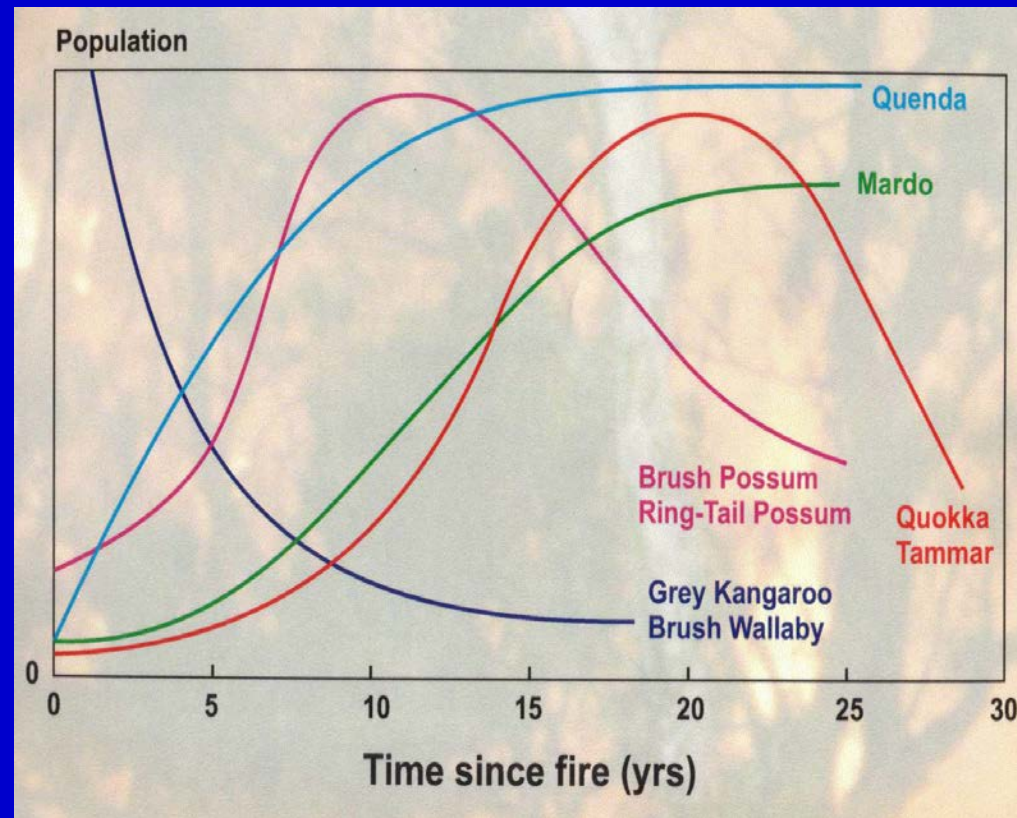
Avoid applying the same fire regime over large areas for long periods. Fire diversity promotes biodiversity.



Key Principles of Fire Management

Principle 9

All available knowledge, including life histories, vital attributes, historical fire regimes and indigenous knowledge should be utilised to develop ecologically-based fire regimes.



Key Principles of Fire Management

Principle 10

Fire history, vegetation complexes and landscape units should be used to develop known and preferred (ideal) fire age class distributions.



Key Principles of Fire Management

Principle 11

Wildfire can damage & destroy both conservation & societal values, hence risk management must be based on a systematic approach to identifying and managing the likelihood & consequences of such an event.



Key Principles of Fire Management

Principle 12

Fire management should adapt to changing community expectations and to new knowledge gained through research, monitoring & experience



Fire Management Objectives

at different spatial & temporal scales

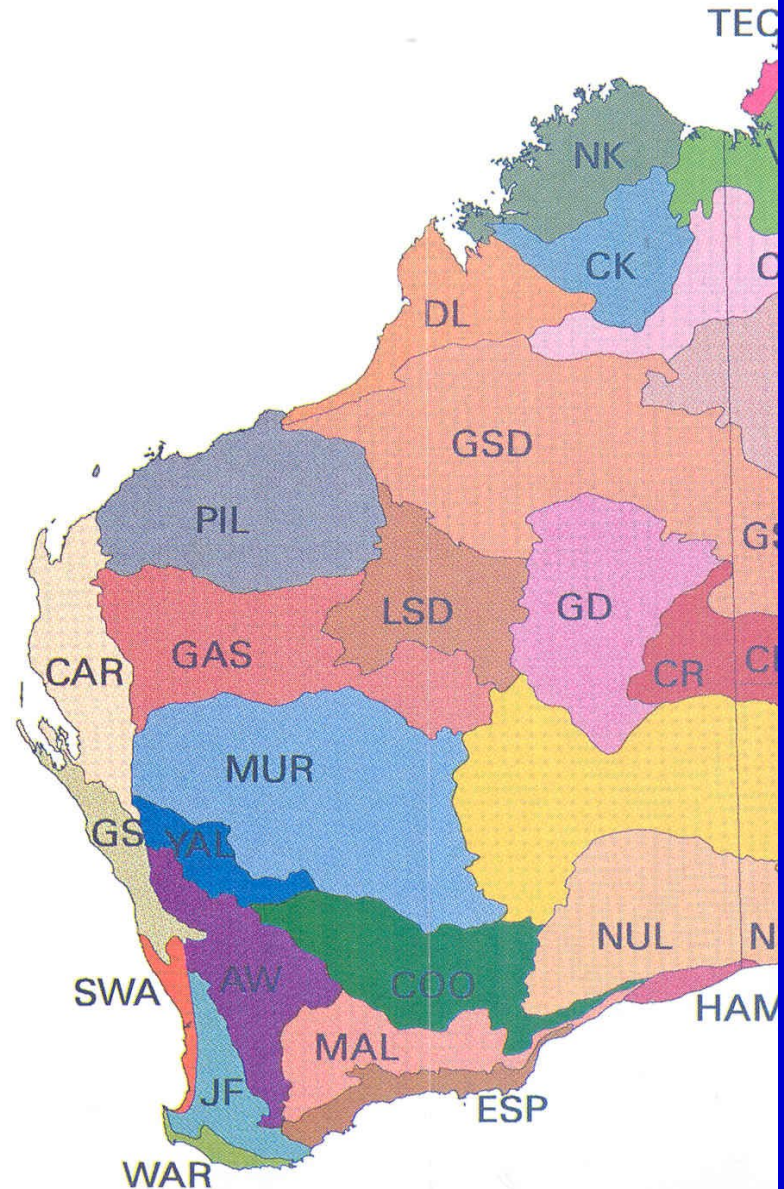
- Bioregional scale (10k-100k km²)
- Landscape scale (10k-100k ha)
- Fire Management Unit scale (<5k ha)
- Veg. Complexes (patches <500 ha)

An Interim Biogeographic Regionalisation of Australia

SCALE: 1:15,000,000

Produced by the Australian Nature Conservation Agency (1995)
Map version - 27 March 1995

Projection: Albers Equal Area
Standard Parallels: 18 and 36 deg. south
Central Meridian: 132 deg. east
Australian Spheroid



BACKGROUND:

This map has been developed through cooperative efforts of the Australian and State and Territory nature conservation agencies. The map provides a broad framework for developing the National Reserves System for Australia.

Whole- of-Bioregion Scale

- Broad Objective:
 - Protect and promote biodiversity while providing adequate level of protection to fire sensitive communities and societal values.
- Broad strategies:
 - Using best available knowledge, maintain a mosaic of interlocking patches representing a diversity of fire regimes.
 - Wildfire threat analysis.
 - Adaptive management

At the Landscape Scale

A definition of a landscape:

“A mosaic where the mix of local ecosystems and landforms is repeated in a similar form over a kms wide area. Several attributes, including geology, soil types, vegetation types, local faunas, climate and natural disturbance regimes tend to be similar and repeated across the whole area” (Forman 1995).

Fire Management Objectives: Landscape Scale

- To maintain fire diversity, hence biodiversity, through time and space

[with an interlocking mosaic of patches of vegetation at different stages of seral succession including recently burnt and long unburnt, and patches burnt at different seasons and frequencies].

Broad Strategies - Landscapes

- Where practical, fire management units within landscapes should be 500-5 000 ha**
- Mosaic to include a range of fire frequencies and “time since fire” states - the range set by biological indicators/vital attributes.**
- Proportion of landscape at each “time since fire” state to be a negative exponential with parameters set by biological indicators.**
- Wildfires will be part of the mosaic**

Broad Strategies - Landscapes

- **“Dynamic” mosaic ie, temporal and spatial variation - avoid linking patches of similar post-fire state.**
- **Where practical and safe, retain representative “no planned burn” scientific reference areas. These should be 200-500 ha.**
- **Planning will require utilisation of a number of biophysical databases/information systems.
GIS platform**

At the Fire Management Unit Scale

A definition of a fire management unit:

A spatial element within a landscape. It could be a (sub)catchment or a management boundary, such as a forest block - it could contain a representation of landforms and ecosystems common to the landscape: (500 - 5,000 ha)

- *To maintain fire diversity and hence biodiversity by introducing patchy burns at various intervals and seasons.*

Broad Strategies

- Fire regime for a management unit should vary in season, frequency and interval. Ranges determined from vital attributes.
- Less flammable (fire sensitive) habitats (e.g., riparian zones, some swamps, valley floors, granite outcrops) should be burned less frequently (e.g., min 20-25 yrs).
- More flammable habitats burned at intervals ranging from frequent to infrequent (see Burrows and Friend 1998).

Broad Strategies

- Burn patchiness and protection of fire sensitive habitats best achieved by low intensity fire under moist conditions.
- Moderate intensity fires under dry conditions should be applied infrequently (see Burrows and Friend 1998) and on smaller scale.

At the Species Scale

At the scale of threatened species (& communities)

Legislative protection (sp.):

- Careful derivation and implementation of fire regimes or of fire exclusion (precautionary approach)
- Protect from regimes known to be deleterious
- Protect isolated populations/communities from single event impacts
- Research & monitor

Adaptive Management

- Monitor & Record (Plan – Do – Check)
- Research (new & existing knowledge)
- Capacity (skills, experience, resources)
- Review (self-appraisal, scan horizon)
- Respond (strategic adaptation)