



Fire Management for Biodiversity

The most important step in fire management is understanding how species, populations and communities respond to fire regimes.

Different plants and animals have different tolerances to fire regimes because of their biology. Where inappropriate fire regimes for any given species occurs across the majority of its habitat, there's a high chance of that species occurring disappearing from the area.

Fire management for biodiversity conservation is all about minimising the risk of extinctions resulting from inappropriate fire regimes. When we determine guidelines, the species with the most demanding or sensitive requirements in relation to fire frequency, intensity, season and extent are used to define the minimum (or maximum) fire regime. These species are called Key Fire Response Species. Vital to this whole process is the understanding of the shelter, food, and breeding/ recolonisation requirements of those species.

The steps to determine Ecologically Appropriate Fire Regimes

When determining guidelines for ecologically appropriate fire regimes DEH uses the following steps:

- Identify the objectives for the area
- Compile lists of flora and fauna in the community and highlight those that are significant
- Identify species (both flora and fauna) vulnerable to changes in fire regime (Key Fire Response Species)
- Assess the impact on the Key Fire Response Species of any fire regime.
- Specify appropriate minimum/maximum fire intervals, fire intensity, range of the season and fire extent based on the most Key Fire Response species.
- Review Key Fire Response Species as any new information becomes available.

These guidelines are used to define a window of acceptable fire regime (in particular, fire intervals) that ensures the conservation of existing plant and animal species.

Using fire as a tool for good social and biodiversity conservation

In summary, any program implementing ecological fire regimes must:

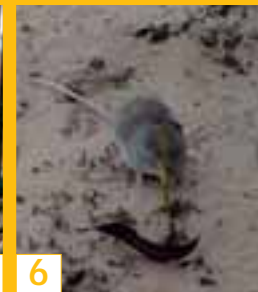
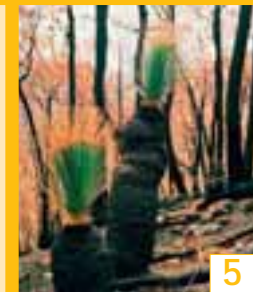
- Focus fire management on the conservation of populations (rather than individual animals) across a landscape with the goal of avoiding local extinctions
- Use vital attributes to identify groups of species most susceptible to inappropriate fire regime
- Develop Ecological Fire Management Guidelines for an area from knowledge of the life histories or vital attributes of the flora and fauna
- Apply a range of intensities, frequencies, seasons and scales of burning to optimise the conservation of biodiversity
- Actively manage fire. Fire events will - and may need to - occur
- Monitor fire management results and use these to determine future action

Want to know more?

For more information on this topic contact the Fire Management Branch, Adelaide 08 8124 4833 or visit the DEH website www.environment.sa.gov.au

Fire – a natural part
of our landscape





Fire - a natural part of our landscape

Fire has played an integral part in the ecology of the Australian landscape for millions of years. Over the last 40,000 years Aboriginal people are thought to have used fire to manage the landscape and ever since European settlement, fire has been used for land clearing, agriculture and forestry.

In any area, soil type, rainfall and fire regime are very significant in shaping the area's ecology. The fire regime is the frequency, intensity, season and type extent of fires in that area. So you can see how important it is for reserve and land managers to know how fire behaves and the way plants and animals respond to fire regimes.

While fires can cause death of some individual plants and animals, it is also responsible for stimulating the regeneration and renewal of habitat for others.

Examples: Banksia ornata mostly regenerates from seed following fire or other disturbance (pictures 2 & 3).

Silky mice mainly occur in heathland areas with plants which produce seed all through the year, this can occur as soon as 2-3 years following fire (pictures 4 & 6).

Grasstrees are stimulated to flower and seed following fire (pictures 1 & 5).

South Australia's special conditions

Since July 2001, 378 bushfires have burnt over 834,000 hectares in South Australia's Reserves.

These fires start when three essential ingredients occur: fuel plus warm, dry weather and an ignition source.

The vegetation that our parks and reserves specifically conserve is ideal fuel. Many Australian trees and shrubs have highly flammable oils in their leaves, while the litter layer of fallen leaves below, burns well when dry.

Southern South Australia's Mediterranean climate of wet winters and warm dry summers produces rapid growth conditions in winter, followed by dry summers - ideal for burning. Lightning strikes from dry thunderstorms ignite most of the naturally occurring fires. However, arson in parks and other accidental fires in agricultural areas are still significant sources of bushfires. Even in the semi-arid parts of the State, the climate is hot and dry for much of the time, broken by the sporadic heavy rain.

How fire shapes biodiversity

While bushfires can cause damage to homes and infrastructure in settled areas, we can use fire to our advantage - to shape the biodiversity of our parks and reserves - with careful study, planning and management.

We need different fire regimes for different areas because the interval between fires affects the growth cycle of plants and animals. Species, such as Desert Banksia (*Banksia ornata*), may not survive if fires are too frequent, as the plants require between 7 to 15 years to reach maturity and set sufficient seed before the next fire. When this occurs Desert Banksia will be replaced by another species that has adapted to frequent fires, such as Tea-Tree (*Leptospermum*) which resprouts following fire. Infrequent fires can disadvantage plants that need fire to assist regeneration, such as heath species. Long periods without fire and short fire intervals can both lead to declines in biodiversity.

Are our animals safe?

Just like plants, animals have fire survival techniques. Most mobile animals like birds, kangaroos and wallabies can move out of burning areas to safety in unburnt areas.

Wombats and echidnas can survive fire by sheltering in burrows or logs as the fire passes. Reptiles and amphibians take refuge underground, while possums and other arboreal mammals move from tree to tree ahead of low intensity fires, or seek safety in the high crowns and hollows of trees. Most insects are well adapted to survive fire under bark, under the litter and soil or by flying.

These animals re-colonise from unburnt areas when the habitat has become suitable again. Our fire management plans and prescribed burning programs will ensure that habitats are maintained for plant and animal species occurring in our reserves.