

# Fire Management in the Southern Fitzroy Floodplain

*This bulletin examines wetland fire management issues and investigates trials conducted in the Southern Fitzroy Floodplain.*

## Role of Fire

### Why is fire so important for wetlands?

In the seasonally dry tropics, wetlands are not always wet so burning (or the lack of it) has a major influence on the condition and composition of vegetation adjoining and even within wetlands.

### Impact of fire

Riparian (stream bank) vegetation is an important component of wetland habitats. Intense fires can damage this vegetation leading to loss of over storey and fringing vegetation which provides wildlife habitat and assists with bank stability and water quality. The lack of fire can also affect species that depend upon fire to encourage germination and recruitment of new plants.

### Fire is a tool for wetland management

Reinstating natural fire regimes in native wetland ecosystems can improve native vegetation condition and can also be used to control fire sensitive weed species (e.g. hymenachne) and remove plant material that would otherwise rot when inundated during the wet season thereby reducing the dissolved oxygen levels of the water.

## CONSIDERATIONS FOR A FIRE REGIME

1. **Intensity** – A 'hot' or 'cool' burn is determined by fuel load, season, time of day and weather conditions.
2. **Frequency** – Refers to how often a fire occurs on average (i.e. annually, every 3 years, >5 years)
3. **Seasonality** – Describes whether the fire occurs 'early' or 'late' in the dry season or as an early wet season burn after the first storms.



*In the seasonally dry tropics, fire can be a useful tool to manage wetlands however a number of factors must be considered.  
(Photo courtesy Jim Tait)*

## Fire Management Issues

### Manage fire intensity

When considering 'controlled burns' it is important to consider that many of the grasses in the present-day landscape are not native and have higher fuel loads and different burning characteristics from the native grasses that previously dominated the landscape. The impacts are further highlighted when the introduced grasses are ungrazed, such as on public land and reserves. On the Floodplain, some sites have stands of guinea grass up to two metres high on levees and old growth para grass forms dense thickets around the fringe of the waterbody. Previously these areas would have had grasses such as forest blue grass on the levees and native couch on the wetland margins, neither of which have the biomass and fire fuel load potential of the introduced grasses.

A dry season fire where there is a lot of plant material and a dense body of grass can create an extremely 'hot' burn that has the capacity to kill mature riparian and wetland trees such as blue gums and other *Eucalypt* species or paperbarks (*Melaleuca* species). If unmanaged, successive hot fires in a riparian or wetland vegetation community can lead to the total loss of over storey trees with associated loss of habitat for wildlife, reduction in bank stability, soil erosion risks and potential to affect groundwater levels.



*Large fuel loads can create 'hot' fires that kill mature trees.  
(Photo courtesy Ken Rutherford)*

### Using fire for weed control

Fire is a potentially useful and cost effective broad acre wetland management tool. The potential for using fire to control rubber vine infestations in riparian vegetation has long been recognised although there are associated risks to native trees if the fire is too 'hot'. The fire sensitivity of many of the 'ponded' pasture species is well known to pastoralists who have avoided burning areas in which they have sought to establish and promote them.

For wetland managers trying to re-establish native biodiversity, the fire sensitivity of undesirable plants presents a management opportunity for reducing their dominance in favour of more fire hardy native understorey and groundcover species such as grasses and sedges.

### Native wetland vegetation depends on fire

The majority of wetland vegetation in the seasonally dry tropics has evolved with exposure to fire. Many species of trees including wattles, *Banksias*, *Eucalypts* and *Melaleucas* produce their seeds within protective seed cases, pods or nuts that respond to heat exposure by cracking open and germinating or depositing seed in fresh ash beds where there is little immediate competition with other ground cover plants for sunlight, soil and moisture. While many of these species may not be solely dependent upon fire for germination and recruitment, their success in the absence of fire may be greatly limited.



*Ungrazed guinea grass at Toonda Lagoon created hot fires that killed rubbervine however also damaged blue gums. Fencing has now enabled seasonal grazing to occur.  
(Photo courtesy Jim Tait)*

## Fire Management Trials

### Grazing to reduce hot fires

Controlled grazing has been trialled at several wetland sites in the Southern Fitzroy Floodplain. The impacts associated with grazing of stock (such as trampling, soil compaction and erosion) also need to be managed when grazing wetland areas. To minimise potential impacts, areas are grazed seasonally (for several months at the end of the wet season, March – May) and a monitoring program including fixed photo points tracked key condition indicators including ground cover, plant diversity, biomass and bank compaction. The option for re-instating grazing in spring is also an option in wetter years when late winter or spring rainfall could regenerate grass biomass. The possibility for reintroducing 'cooler' burns for encouraging greater biodiversity is also possible.

### Use of hot fire to reduce introduced pasture

Given the known fire sensitivity of para grass, an intentional hot burn was conducted at a site that was totally dominated (100% cover) by para grass and a fire break was established to minimise risks to adjoining riparian vegetation. It was planned that a wet season inundation event following the burn would drown out para grass regrowth but unfortunately the wet season failed to materialise so seasonal grazing was introduced 1½ mths after the burn. Results observed include:

- Near 100% kill of para grass in areas that experienced the hottest fire with only 10-30% kill in other areas
- Increased palatability of grass after the burn
- Death of re-shooting para grass where wet season run-off ponded for 2 weeks
- Quick re-establishment of para grass to 95% cover 6 months later
- Increase of natives sedges and forbs (5% cover).

The following recommendations would improve habitat and better control of para grass:

- Allow cattle access to the burnt area as soon as possible after the fire
- Increase stocking rates in the burnt paddocks
- Direct seed into the ash bed to improve the recruitment of other species after the fire
- Conduct the burn when soil moisture is minimal and the likelihood of significant follow up rainfall is also minimal or that a significant inundation is likely.



Near 100% kill of para grass was achieved at Gracemere Lagoon Reserve where many years of old growth contributed to an extremely hot burn. (Photo courtesy Jim Tait)



Monitoring helps determine if habitats are improving and at this site the burn has increased the number of native sedges and forbs. (Photo courtesy FRCC)

## Ways Forward

### Combine fire with other management tools:

Fire is best integrated with other wetland management initiatives as it is a low cost option for controlling some weeds, increasing the palatability of pastures (grazing) and if done properly can improve biodiversity.

**Habitat specific:** Fire is not suited to all wetland communities however it is beneficial for wetlands that are losing fire dependent species if hot fire risks are managed appropriately.

**Identify appropriate fire regimes:** Property Planning can help identify different types of wetlands and suitable fire regimes for each in order to satisfy both habitat and production outcomes.

**Capacity building:** Controlled burning as a landscape management tool can pose personal and legal risks. Developing collaborative arrangements between rural fire brigades, land managers and agencies and making resources available to conduct burns will make fire management a more viable option.

Trialling new management approaches, monitoring outcomes and being flexible to adjust management practices is important for managing wetlands in the Southern Fitzroy Floodplain.



Australian Government

The Queensland Wetlands Programme - Great Barrier Reef Coastal Wetlands Protection Programme is funded by the Australian Government. The main objective of the Southern Fitzroy Floodplain project was to engage land managers in activities and practices to help manage and enhance the area's important wetland values.

Queensland  
Wetlands Programme

## Further information

The information series is available on-line from the FRCC website or by request and includes Helping Wetlands, Fish, Fire, Grazing, Getting Involved and Waterbirds.



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