

# Fire management at Ban Ban Springs, NT

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Fire management is an integral part of the overall station management in Northern Territory pastoral enterprises. Land managers have long recognised the need to get their fire regimes right and are finding it increasingly difficult to do so as the complexity of issues surrounding fire also increases. Ban Ban Springs reveals one way these complexities are dealt with in a practical sense.

**B**an Ban Springs is an 1873 km<sup>2</sup> pastoral station around 130 km south-east of Darwin in the 'interior Top End'. It has an average rainfall of 1200 mm per year. Tom Starr managed this property for around 14 years from 1984 to 1998, successfully using fire as part of his management during this time.

The predominant pasture species is Kangaroo Grass (*Themeda triandra*) and there are annual and perennial Spear grasses (*Sorghum spp.*).

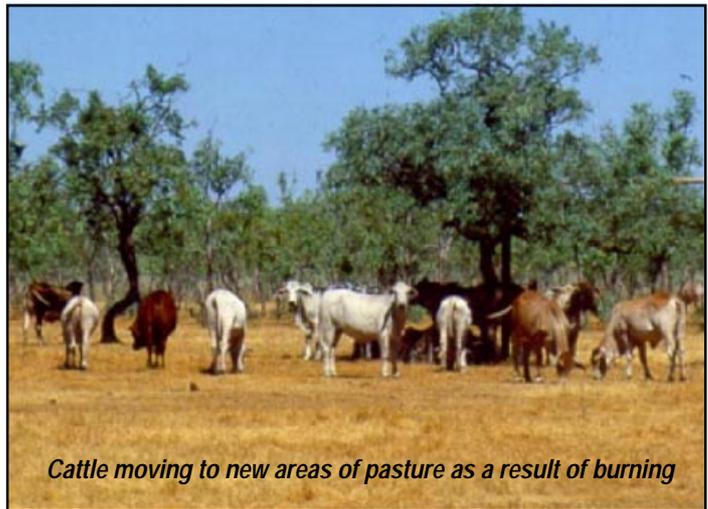
Overstorey trees and shrubs are typical of the open savanna woodlands of the Top End and show considerable diversity, along with topographic variations between high steep ridges in the east and west and the extensive flood plain along the Margaret and McKinlay rivers.

Geology, combined with climatic conditions past and present, is the primary cause of topographic, soil and vegetation variation. Soil types vary from the sediment rich (though generally nutrient deficient) plains to granite boulders and ridges. There are gravel littered lowlands and undulating ridges as well as relatively steep shale and dolerite ridges. Soils are typically nutrient deficient, with the exception of the dolerite derived soils and small areas of black soils associated with springs. The granite-based soils are particularly poor with unstable structure.

The density and type of pasture species are strongly aligned with soil type and topography. *Sorghum spp.* tend to dominate the granite soils and general density and fuel loads are low. There are numerous valleys and drainage areas associated with the granites that act as a wet season sponge and provide green feed well into the dry season. Dense stands of *Themeda spp.* can be found all over the dolerite country.

## Fire management regime

The fire management regime at Ban Ban Springs has improved the pastures in the smaller paddocks close to the holding yards and the main homestead. Outside these areas cattle are grazed on native pastures in relatively large paddocks (3000–15 000 ha). The native feed is heavily supplemented with nitrogen in the form of urea combined with other minerals and molasses. Stocking rates of one beast per 10 hectares (1:10 ha) generally apply to these paddocks. Appropriate burning regimes are considered to provide the highest economic return



*Cattle moving to new areas of pasture as a result of burning*

through animal live-weight gain provided the stocking rates are no more than 1:10. The burning regime revolves around extensive burning during the early to mid dry-season, coupled with selective wet season burning for juvenile trees and *Sorghum spp.* control.

Heavy stocking rates—those more than 1:10—coupled with dry season burning, can rapidly deplete pastures, if repeated for as few as three consecutive seasons. This relatively high grazing pressure coupled with such a burning regime also favours shrub and tree growth, as well as introduced weeds.

Other considerations in the choice of fire regime are the increased use of fences. Fire close to fences destroys the protective galvanised coating leading to rust or simply wires snapping. Fences, while controlling stock, put constraints on fire management due to the costs of fence protection.

## Timing of fire application

Ideally, late wet season or early dry season burning (March–May) is restricted to about one third of the grazed part of the property each year. This produces a three-year cycle under which the property is burned.

Practically it has been possible to burn about half of each paddock, notwithstanding that wildfires can and do destroy the intended burning regime. Burning on Ban Ban Springs can be opportunistic and generally takes place before the ground has dried to the stage where it is possible to grade the firebreaks.

Reasonable control of the fires is maintained by using skill, knowledge and judgement to apply fire at the





best possible time for the property. There is a window of opportunity for burning in this way each year that varies depending on the length of the wet season, the amount of rain that has fallen and the prevailing weather conditions. During the months of March to May relative humidity is still generally high, with lower daytime temperatures. Night conditions are generally cooler and lower dew points assist in putting fires out over night. Moist creek and drainage lines will maintain belts of green pasture that will not burn. These factors combine to make late wet season/early dry season burning a manageable option for Ban Ban Springs.

### **Burning benefits to pasture and stock**

Burning at this time is essential to assist in the control of wildfires throughout the ensuing dry season. In addition there are benefits to pastures and stock. After burning, perennial grass regrowth is of a higher quality than the standing pasture on offer, although the 'green pick' may lack bulk and can limit feed intake.

Some of the major benefits are:

- **Increased protein content**

It is estimated that the new growth of perennial grass has a protein content between 5 and 9 per cent and can produce an extra 30 kg of live-weight gain over animals grazed on unburnt pastures (Winter 1987).

Unburnt pastures that have matured have protein levels close to 1 per cent. Given that a lactating cow needs 7 per cent protein as a minimum for body weight maintenance, it follows that careful management of the herd and pastures is necessary to achieve desired returns. By maintaining the ratio of 30–50 per cent burnt to 50–70 per cent unburnt it is possible to extend the quality grazing period further into the dry season.

- **Improved condition of herd**

Grazing the breeding herd on this combination of burnt/unburnt pastures allows weaning of calves earlier in the dry season meaning breeding cows are in better condition later into the season. There are consequent reproductive benefits from this better body condition.

- **More even grazing pressure**

Cattle prefer to graze young, short, green pasture that is provided by burning and to a lesser degree by grazing. The fire regime used provides ample of this type of pasture, albeit, short-lived, if the paddock is being grazed at the time of burning. Grazing pressure will shift within days to the burnt areas where it is common to find 90 per cent or more of the stock.

- **Improved musterability of stock**

Early dry season stock are usually soft, having green feed on tap. Little work is involved for them to get feed and water. Cattle later in the dry season have no trouble covering 8–10 km without being over-stressed, while at the end of the wet season they have a hard time covering 5 km. Fire concentrates the herd, and mustering can be planned to maximise mustering percentages at minimum cost.

### **Other fire-management options**

Late dry season fires would have been more extensive prior to pastoral activity in the Top End as a result of

lightening strikes during the build up to the wet season. These late dry season fires are hard to control because the fuels are generally 100 per cent cured and weather conditions are often hot and dry. The danger is that these fires deplete all the available pasture in some areas, leading to a feed shortage if the follow-up rains are late.

Late dry season fire is an option as an effective means of controlling woody weeds. To do this well the paddock should be lightly stocked (one beast: 30 ha) encouraging a build up of grassy fuel load to produce the high intensity fire needed. These kinds of burns should take place after rainfall of at least 100 mm or, at the onset of the full wet season, to reduce the risk of total pasture depletion and to encourage rapid pasture regrowth.

In a poor wet season, burns can be carried out in those wetter areas not normally burnt during the late wet season or early dry season burns. This is an opportunistic use of fire very dependent upon the season. Wet season fire can also usefully control introduced weeds, particularly annuals. As long as there is an underlying body of fuel remaining from the previous season, a fire used after the annuals have germinated will effectively wipe out that years crop, and the seed production as well. This principle can also be applied to annual grasses like native *Sorghum spp.*

Sorghum burnt in this way can be eliminated, clearing the way for more perennial species and/or shorter more nutritious annuals. It also reduces the risk of wildfire in the Top End. However, *Sorghum intrans* (annual spear grass) flowers and sets seed in a relatively set time frame regardless of groundwater conditions. It is therefore dry enough to burn well before other species and can be used to great advantage in the fire-management regime.

### **Need for cooperation**

Ban Ban uses a combination of planned and opportunistic burning in its fire management regime. Opportunistic burning is conducted in conjunction with other station operations at times when it is likely to achieve the desired result. The Bushfires Council of the Northern Territory's aerial controlled burning program is used to assist in the early dry season fire management operations. Incendiaries dropped from a helicopter are used to ignite strategic areas for fire control and pasture management at times when access to the country is still limited. An aerial drip torch is used to ensure that secure burnt lines are established in areas that are too wet or green for effective incendiary ignition.

The Bushfires Council also provide fire history maps that assist with planning and monitoring. Prior knowledge of burnt areas has been used successfully to save time and resources when combating wildfire later in the dry season.

### **External influences**

There are a host of other influences that impact on the fire management program from year to year. The pastoral lease is rarely the sole domain of cattle or buffalo now in the Northern Territory. Ban Ban Springs has

had to diversify to maximise the use of resources and produce profit.

Diversification has taken the property into:

- Tourism which provides a unique experience of working on a property and being able to encounter native flora and fauna. A well-planned fire regime is inherent in maintaining the diversity that this enterprise is built on.
- Hunting, in particular, seeking feral pigs and buffalo as game. Fire is used to provide the pastures to maintain these species and allow hunters an easier access. However, each species needs careful management for environmental purposes and there may be increased wildfire danger through poachers trying to access game, either by lighting fires accidentally or deliberately.

Mining leases also cover the property and exploration by miners has accounted for numerous fires, accidentally and deliberately lit by geologists to clear a working area. Generally though there are now working arrangements in place which decrease the risk of fire being lit under unfavourable conditions.

Properties like Ban Ban Springs are managed and worked with a limited labour force. Thus if a fire does get away then it normally has to be allowed to burn out naturally, or burn to previously burnt areas or it is indi-

Northern Territory Bushfire Council maps on the fire history of an area can be accessed by contacting its regional offices:  
Darwin: (08) 89844000

rectly controlled by back burning from natural or man-made breaks.

## Summary

It is evident that the success of any burning regime requires a thorough understanding of the inherent features of the landscape, the pasture and other vegetation on the landscape, climate and weather conditions and of the use of fire itself. Local knowledge is therefore a valuable asset to managing the property.

Fire can be used in many ways to achieve various outcomes. It is important to understand what it is that a fire is going to achieve for the property—the benefits to pastures, the control of weeds or the prevention of wildfires.

## References

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