

March Meeting Report: Greg Miles
Burning in the Top End of the NT - A different
slant on fire & why it is knocking out wildlife.

Greg Miles is a former Kakadu National Park Ranger who was one of those employed when Kakadu was first declared as a National Park in 1976. He experienced many years living and working amongst the prolific wildlife of Kakadu and is concerned by the small mammal decline that has been documented by John Woinarski and others. *For more information on the small mammal decline see the Into Oblivion report at: http://www.feral.org.au/wp-content/uploads/2010/09/into_oblivion.pdf*

Since his retirement, Greg has spent a lot of time contemplating possible causes for the ongoing declines but failed to come up with anything conclusive. He did however come up with the idea behind this presentation.

Greg believes that burning in the Top End has been shaped by a range of factors including historical indigenous burning, grazing by buffalo, the early burning policies of rangers, introduced pests including cats and cane toads and finally termites. Currently accepted fire management recommends that land managers undertake early burning which promotes new growth, fires are cooler and don't scorch the tree canopy, the fires often stop at creek lines or go out at night, creating patchy effects with areas of grass as refuges for wildlife and most importantly the prevent late hot fires.

Historically the indigenous population, estimated at around 3000 aborigines across the Top End between Darwin and Arnhem Land 150 years ago, used fire to manage the land. Greg said an old aboriginal man told him that early burning was not part of the aboriginal fire regime prior to European settlement. Instead they burned all year round. By 1890 the aboriginal population was down to 5% of the original population.

Greg suggests that pre-1890 there was very little spear grass (*Sorghum* sp) across the Top End and therefore early burning would have been difficult. Burning would be done as mid or late dry season fires. This is supported by fire scars mapped in 1996 where much of aboriginal managed Arnhem Land was burned in the mid to late dry season whilst the remainder of the Top End managed by 'Balanda' (white people) was early burned.

Buffalo were first recorded in Kakadu region by Leichardt in 1845 and numbers increased rapidly. Grazing by buffalo removed native grasses by selective grazing but this actually benefited spear grass which becomes unpalatable as it matures. Buffalo hunters also preferred late burning so that the grasses were cleared for the catching season as the floodplains dried out. Buffalo therefore suppressed grassy vegetation right across the Top End. The floodplains were heavily grazed and acted as firebreaks. Throughout a 100 year period and all of these changes, wildlife was booming.

In 1980 the BTEC campaign removed 120000 head of buffalo from Kakadu alone. In the sudden absence of large grazing animals, spear grass exploded leading to hotter and more widespread fires. To further encourage the spear grass the recently appointed Kakadu park rangers were busy with early burning to manage the country. About 50% of lowland Kakadu was being burned every year to prevent the late season fires. CSIRO ecologists now recommend that not more than 25% of land be burned every year so twice the recommended area was being burnt annually.

Termites are a huge resource in the Top End ecosystem. They feed primarily on grasses and all send out flying breeders once a year which are prized food source for many other species of wildlife especially as a breeding stimulus and to feed young. A single cathedral mound eats about the same amount of grass per year as an elephant. Early burning severely reduces grass the food for termites and therefore reduces the termite population. Obviously termites still exist but the reduction of this resource may be just enough to tip some wildlife already threatened over the edge.

Feral cats have been in Australia for a long time but through most of this period wildlife has been successfully co-habiting with cats. The impacts of cats are magnified due to fires as hunting becomes easier and there is less shelter. At Mornington Station Australian Wildlife Conservancy researchers' radio collared a feral cat and watched as it travelled 15km from its usual home range to a newly burned area where it was joined by other cats that hunted the wildlife to annihilation for several weeks after the fire before returning to its original home range.

Cane Toads were introduced into Australia in north Queensland in 1932 and in 2001 the first cane toad reached Kakadu. Carnivorous marsupials are particularly vulnerable to cane toad toxins.



Good money is spent on aerial ignition - but timing is everything. Photo by Greg Miles.

Aerial burning is supposed to mimic the aboriginal burning practice of walking through the bush lighting fires, but the landscape is quite different with lowland savannas now around 60% spear grass.

CSIRO recommends that we burn 1 year in 5 so today we are burning far too much country too often and too early. Early burning is detrimental to ground birds such as finches and partridge pigeons. These birds lose the seed resource or nests and are exposed to predators due to the lack of shelter.



The Partridge Pigeon (Ragul) is one of the first to suffer from wide scale early burning. Photo by Greg Miles.

In rural areas where early burning is not carried out there is greater diversity of habitat and the ground birds are more common. There is also a whole suite of animals that we simply don't know enough about which are suffering under current early burning regimes such as blue tongue lizards, chameleon dragons, diadem bats and echidnas.

Of course there are winners from early burning. In the woodland birds such as kookaburras, bustards that prefer open grassy area where prey is easily seen, and black cockatoos that love spear grass seed. Losers include lorikeets as flowering is affected by early burning.

On the wetlands Para grass actually burns whilst floating on water. Early burning of floodplains kills many animals that would normally shelter in the cracking clay when it dries out but has not dried out enough to crack and provide shelter with early fires. There are two sides to this issue too, with mid dry fires exposing animals that survive by sheltering in the cracks to predators but some will survive predation, unlike the early fires which wipe out everything.

In sandstone country up to 26% of the country is burned each year. This country is protected to some degree by the amount of exposed rock that will not burn and acts as a firebreak. In Kakadu and Arnhem Land Indigenous Protected Areas (IPA), endemism reaches a peak with up to 250 endemic species found in this habitat.

Greg points out that early burning removes a large portion of both plant and animal resources in an abrupt and unnatural way. Seeding of annual plants is curtailed, termite food (grasses) is removed, insects and many small animals are killed directly rather than providing food progressively further along the natural food chain.

It is obvious that the current late fires are worse than early fires and Greg acknowledges this. So what should we be doing instead? Greg advocates wet season fires, particularly in areas where there is old spear grass as fuel. These fires are cooler and if timed well may cause local extinction of spear grass for between 1- 5 years. Over time this reduction in spear grass will encourage more native perennial grasses and more diversity of annual grasses. Greg has seen this in action and reports that a mid-afternoon litter fire is low enough to step over even in

September, so this type of fire produces a very cool burn.

The problem of 'firebugs' lighting fires along roads are a concern, as are lightning fires. For this reason Greg suggests that some early burning may be necessary to divide up the country and create firebreaks. However, undertaking a wet season burning program to create spear grass free areas to protect the remainder of the country would be even better. Obviously introduced weeds such as Gamba grass and Mission Grass are a whole different story, they are much worse than spear grass for fire intensity. Control and preventing spread of these grasses is therefore critical.

We thank Greg for such an interesting and thought provoking presentation. *I have been looking at the country quite differently since your talk and I think you might be onto something with wet season burning increasing grass diversity....*

Article by Sarah Hirst.