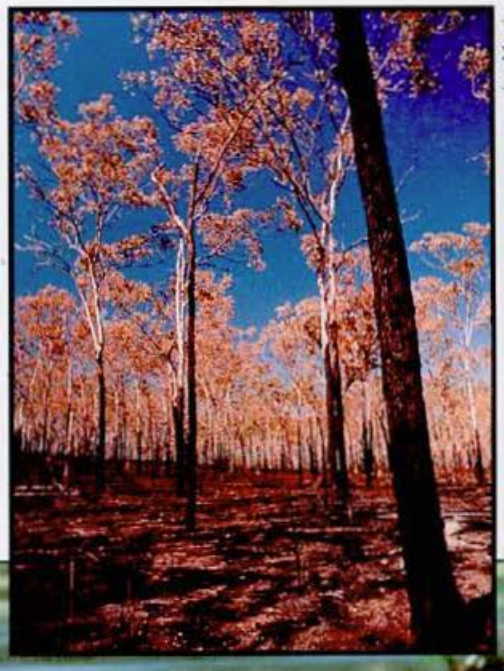
Cease-fire at Ka

Barbara McKaige



Ian Morris

Above right and above: Fire in northern Australia is a different phenomenon to that in southern Australia. The hottest fire recorded at Kapalga was only one fifth the intensity of the Ash Wednesday fires in Southern Australia.

Right: Australia's wet-dry tropics provides a refuge for species such as the magpie goose, the northern quoll and the partridge pigeon. CSIRO research at Kapalga has assisted in the management of this unique region.

palga

Two decades of ecological research drew to a close in May this year when CSIRO's Division of Wildlife and Ecology ceased managing Kapalga Research Station in the Northern Territory's Kakadu National Park.

Kapalga has been at the forefront of research for conservation management in tropical Australia since its establishment by the division in 1976. Studies have focussed on the wildlife of Kakadu's wetlands, the impact of Asian water buffalo, and recently fire, the Top End's most contentious land-management issue.

Lessons learned at Kapalga can be applied across the wet-dry tropics of Northern Australia – from the Kimberley in Western Australia to Queensland's Atherton Tableland – a region recognised worldwide for its relatively pristine condition.

Australia's wet-dry tropics provides a refuge for species such as the magpie goose, the northern quoll and the partridge pigeon, whose geographic range has contracted due to extensive land clearing since European settlement. CSIRO established Kapalga to conduct long-term landscape-scale experiments as a basis for managing this unique region.

Former officer-in-charge of Kapalga Dr Dick Braithwaite says scientists from CSIRO, land-management agencies, and universities from Australia and overseas have conducted research at Kapalga, with more than 190 scientific publications resulting from 130 on-site studies.

To commemorate these achievements, a public open day was held at Kapalga in April. The event was launched by Federal Minister for Primary Industries and Energy, Senator Bob Collins, a former CSIRO research officer, and one of the first to work at Kapalga in the 1970s.

The area known as Kapalga was originally part of the lands of the Kurnbudj language group but it is thought that no traditional owners remain. The name Kapalga is a rendering of the Aboriginal 'Gabarlgu'.

An Anglican Mission occupied Kapalga for a few months at the turn of the century, but the use of the area by Europeans was not intensive. Between the two world wars the area was used by buffalo hunters and in 1976, Kapalga was set aside by the Federal Government for CSIRO research. In 1984, Kapalga was incorporated into Kakadu National Park as part of Stage II, which was added to the World Heritage List in 1987.

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Buffalo controversy

Studies at Kapalga initially focussed on the wildlife of Kakadu's famous wetlands, including the impact of the feral Asian Water Buffalo, *Bubalus bubalis*. Buffalo were introduced into Australia from Indonesia last century, and by the early 1980s there were an estimated 250 000 spread across the Top End's wetlands.

The effects of buffalo on the environment were once highly controversial. Some people argued that their high densities were damaging the region's wetlands with trails, wallows and swim channels, and by breaking down river levees, allowing saline water into

freshwater wetlands and killing areas of paperbark forest. Others believed the buffalo's impact was insignificant. An experiment to test the effect of buffalo on the environment was clearly needed.

After preliminary exclosure trials, a buffalo fence was erected across Kapalga in 1981. This enabled areas grazed by buffalo to be compared with those from which they were excluded.

The studies offered the only experimental evidence of the effects of buffalo on ecosystems of the Top End. They showed that although the buffalo had a detrimental effect on wetland habitats, there had been no loss of species, and the ecosystem recovered rapidly after buffalo were removed.

Buffalo research was completed in 1986 with the animals' removal from Kapalga in accordance with the national Brucellosis and Tuberculosis Eradication Campaign.

Research heats up

The next major phase of research at Kapalga was the Fire Experiment. Fires are extraordinarily common in the dry season, and most are lit by humans. Burning is carried out for a variety of reasons including property protection, management of conservation areas, improving pastures for cattle production, and land-management by Aboriginal landowners.

The result is that the savannas are burnt on average every two out of three years, and often annually. It is this high frequency that makes fire in tropical Australia a different phenomenon from that in temperate and arid zones.

Despite the widespread use of fire, little is known about its ecological effects. In the late 1980s the Division of Wildlife & Ecology tackled this issue by establishing the world's largest fire experiment (more than 200 square kilometres in size) at Kapalga.

The experiment aimed to identify the optimal fire management practice for the conservation of Top End ecosystems by seeking answers to questions such as:

- How do different fires influence animals, from insects such as ants, to large predators such as dingoes?
- Do fires increase soil erosion and loss of nutrients?
- Do fires late in the dry season convert forest to grassland?
- How can rare species be protected by fire management?
- Are fires in the Top End important contributors to the Greenhouse effect?

Experimental burning at Kapalga was conducted for five years, finishing last year, and scientists are now analysing the data collected. A report on the project and its findings will feature in a future issue of *Ecos*.

What now for Kapalga?

The division has relinquished its role at Kapalga in order to expand its studies across northern Australia as part of the new Cooperative Research Centre for Sustainable Development of Tropical Savannas.

The centre, based at Darwin's Northern Territory University, draws together 12 organisations from the NT, Western Australia and Queensland. It is funded for seven years with $16 million from the Federal Government, and will help land managers in Australia's tropical savanna to pursue ecologically-sustainable development. Issues such as pastoralism, tourism, traditional Aboriginal land-use, conservation and mining will be studied.

The future of Kapalga will be decided by the Australian Nature Conservation Agency, the manager of Kadadu National Park. Braithwaite says CSIRO hopes to see Kapalga continue as a research station. 'Kapalga is unique, there is no other research facility like it in Australia, or indeed, the world,' he says.

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Research on vulnerable mammals, such as the northern brown bandicoot indicates a complex relationship with fire. CSIRO Wildlife and Ecology technician Gus Wanganeen worked with 12 mammal species for more than six years as part of the Kapalga Fire Experiment.

Alaric Fisher

CSIRO Division of Wildlife & Ecology Chief , Dr Brian Walker (left) presented Federal Minister for Primary Industries and Energy and a former CSIRO employee on Kapalga, Senator Bob Collins, with a photograph, at the Kapalga Open Day. The photo, which was taken in 1976, is of Senator Collins and other researchers working on Kapalga's floodplains.

Dick Braithwaite

The first landscape-scale experiment conducted by CSIRO on Kapalga was to assess the effects of feral Asian Water Buffalo on the Top End environment.