



SAVANNA LINKS

Cooperative Research Centre for Tropical Savannas Management

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NHT II sets sail: direction uncertain



Photo: Greening Australia

The Natural Heritage Trust was set up to tackle Australia's toughest environmental problems, and was funded with \$1.5 billion from the partial sale of Telstra.

But critics have attacked the effectiveness of the program and are demanding the NHT changes direction as it moves into Stage II.

Dennis Schulz reports.
— Turn to Page 4.



Photo: Jon Marsh

Profile

TOM Vigilante, a PhD student from Northern Territory University, is studying fire management in one of the most remote parts of Australia—Kalumburu in the northern Kimberley.

Savanna Links asked Tom about his Kimberley experience.
Turn to Page 9.

Sustainability needs profits



The Northern Australia Beef Industry Conference, held in November 2001, provided a chance for northern producers and researchers to set directions for future research in the industry.—Page 7.



Photo: Martin Armstrong

Hop into Frogwatch on the web . . .

A NEW website devoted to Australia's northern frogs plans to become an online encyclopedia of froggy facts. Visit to find frog calls, maps of distributions and to look up your favourite frogs.

For example, Dahl's Aquatic frog (left) lives in wetlands and coastal river systems, is thought to be toxic to other wildlife . . . and is known to feed on other frog species.—Page 3.

Workshop on knowledge conservation issues

WHILE it is widely acknowledged that urgent support is needed to conserve indigenous knowledge, what is not so clear is how to make this support effective.

In late March, the Tropical Savannas CRC and the Northern Land Council ran a workshop that aimed to clarify some of the issues surrounding conservation of indigenous knowledge. It aimed to produce an analysis of cultural, social, ethical, and resourcing aspects of indigenous knowledge conservation as well as more technical issues.

It attracted about 20 people from around Australia including those involved in on-ground indigenous knowledge conservation projects; anthropologists and linguists; Geographic Information Systems and computer database specialists; and multi-media specialists who had worked with Aboriginal communities.

Take-home messages

Some outcomes were:

- The best form of knowledge conservation is to have both young and old indigenous people together on country so that knowledge can be passed on.
- Print and videos of indigenous knowledge are less effective but are used by indigenous people in communities. Other electronic media are used even less frequently

and it is unclear which methods of knowledge conservation using electronic media will be most successful in the future. There is more to be done in this area.

Electronic media

Electronic media appear to have the potential, however, to effectively deal with indigenous knowledge for non-Aboriginal and even Aboriginal audiences, if the appropriate delivery mechanisms can be found. This is because of the way electronic media use sound and vision in a dynamic way and can easily show connections between different areas of knowledge.

The workshop agreed, however, that computers and electronic media are an effective way of storing information. However it is important that this information is stored in a consistent manner in a computer database so that it can be used at a later date.

It was also considered essential that intellectual property and cultural considerations are taken into account when dealing with indigenous knowledge.

Another significant outcome of the workshop was the creation of a network of people interested in these issues and who will continue talking and learning.

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Tropical Savannas CRC: Linking the North

The Tropical Savannas CRC is a joint venture of the major organisations involved in land management of the savannas of north Australia. It comprises three universities, government agencies from the NT, Qld and WA and the Commonwealth, CSIRO, and representatives from Aboriginal groups and the pastoral industry.

The Centre promotes sustainable use and conservation of Australia's tropical savannas by acting as a bridge between agencies engaged in land and resource management research, and research users and decision makers e.g. pastoralists, conservation managers, Aboriginal land managers, and the tourism and mining industries.

The Centre communicates outcomes of research and other knowledge about the savannas and ensures this knowledge can be used effectively by people living and working in the savannas.

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Fire book launched in Queensland

QUEENSLAND Emergency Services Minister Mike Reynolds launched the TS-CRC's book on fire management at a meeting of the Queensland Rural Fire Service on March 15.

The book, *Savanna Burning: Understanding and Using Fire in Northern Australia* will be launched in the NT in May. It is also being shown at meetings associated with fire management in the Kimberley.

Savanna Burning provides for the first time a practical and comprehensive guide to managing fires in north Queensland and tropical Australia. It uses practical case studies from land managers as well as collating the findings of researchers on fire across the north. The book's 40 contributors have a wealth of experience in fire management and research across northern Australia.

They include rural fire agency staff, graziers, fire and weed researchers and Aboriginal fire managers.

The authors offer advice on many issues of practical concern in the north including:

- Savanna ecosystems and fire regimes;

- How fire affects plants and animals;
- Aboriginal fire management;
- Managing pasture condition with fire;
- Controlling weeds with fire;
- Controlling woody thickening; and
- Controlling and fighting wildfires.

Price: \$30.00 within Australia; \$45 overseas (postage, handling and GST incl.)

For more information and order forms:

savanna.ntu.edu.au then go to Publications.

To purchase a copy, contact Melissa Tang, Tropical Savannas CRC,

Tel: 8946 6764 Email: Melissa.tang@ntu.edu.au

Check out the order form available in this issue of *Savanna Links*.

NLWRA to roll on

The National Land and Water Resources Audit is set to continue beyond its original completion date of 30 June, 2002. Details are still to be worked out, but the Federal Government is keen to ensure that capacity built up in the Audit's first stage is not lost and benefits maintained.

Go to: www.nlwra.gov.au

Purnululu on World Heritage Listing

Photo: Thomson-Dans/Department of Conservation and Land Management WA



New Heritage listing: in the sheltered chasms and the gorges of the Bungle Bungle range are a number of uncommon species, undescribed species and new records for WA

AUSTRALIA has formally nominated the spectacular Purnululu National Park in the east Kimberley for World Heritage Listing with UNESCO in Paris. The park includes the distinctive banded orange and grey sandstone towers of the Bungle Bungle range, with its spectacular domes, gorges and wet season waterfalls as well as many significant Aboriginal art and burial sites.

The park sits between the hot dry semi-arid deserts to the south and the better-watered sub-humid tropics to the north. This transitional zone possesses a rich mixture of species, some of them endemic. The park's diverse habitats range from open semi-arid plains to moist sheltered gorges.

Until the early 1980s only traditional Aboriginal people and a few local pastoralists, stockmen and geologists knew of the Bungle Bungle range. In 1983 media attention began to attract tourists to the area. The need to protect and manage the area saw it declared a national park in 1987.

The expertise and experience of traditional owners have been formally acknowledged and are incorporated into the Park's plan of management. Assessment by the World Heritage Committee is predicted to take around 18 months. A decision should be made by mid 2003 when it meets in China.

The nomination document can be found at: <www.ea.gov.au/heritage/awh/purnululu>

National conference on landcare heads for northern climes

PLANNING is under way for the next National Landcare Conference, to be held in Darwin in April 2003. It is being organised by numerous groups including the TS-CRC. The conference focus is 'Respecting Values—Working and Learning Together'. It recognises that there are different land-management cultures in Australia and that respecting and understanding the different values of these cultures is a key first step before these different groups can start working and learning together successfully.

Some of the conference themes focus on the issues faced by northern and remote Australia: **fire, weeds and feral animals; capacity building; working and learning with different knowledge systems.** The conference will also look at the economic and social dimensions of land management and the need to manage natural resources more effectively at regional scales.

The conference is particularly interested in the experiences of people with hands-on experience in these land-management issues.

If you want to present a paper, a poster or an audio-visual display, see the flyer that comes with this issue of *Savanna Links*.

For more information contact: Peter Jacklyn
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Northern Australian Frogs Database System

Website hops into the life and times of northern frogs

A NEW website devoted to Australia's northern frogs allows people to track the spread of the cane toad as well as check on the status and distribution of the many native frogs of the north.

The site will become an online encyclopedia for frogs in this region, with pictures, frog calls, maps of frog distributions and answers to many hot frog questions.

These range from advice on

'toad-busting' a particular area, the age of green tree frogs and all sorts of facts on these intriguing amphibians. The site already has information on 61 frogs including the cane toad.

The technology will allow people to enter sightings of frogs including the ubiquitous cane toad, report on its impacts and ask questions about frogs.

The site was put together by Frogwatch NT and is supported by

the Tropical Savannas CRC, the World Wide Fund for Nature, the Australian Association for Environmental Education, the Key Centre for Tropical Wildlife Management at NTU, the Museum and Art Gallery of the NT, the Northern Land Council, Caring for Country Unit and Environment Australia, Kakadu National Park. More information: Graeme Sawyer
Email: GraemeS@entity1.com
Frogwatch: www.frogwatch.org.au

NHT Mark II sets sail: direction uncertain

The Natural Heritage Trust was set up to tackle Australia's toughest environmental problems, funded with \$1.5 billion from the partial sale of Telstra. But critics have attacked the effectiveness of the programs that were commissioned and demand the NHT change direction as it moves into Stage II. *Dennis Schulz reports.*



The Rapid Creek Landcare Group in Darwin plant trees during a recent Arbor Week. This is just one of the many activities funded by the Natural Heritage Trust. Over the past five years of NHT's operation, almost 400,000 Australians have been involved in conserving the environment in a variety of ways including replanting and protecting native vegetation, erecting protective fencing, and clearing waterways of weeds.

After spending \$1.5 billion on myriad environmental projects over its first six years of its existence, the Federal Government's Natural Heritage Trust could be forgiven for patting itself on the back. Across Australia, community groups undertook major projects aimed at the country's major ecological problems, including salinity and excess land clearing. But instead of bouquets it has received brickbats from across the floor of politics, environment lobby groups and even its own mid-term Review.

"The funding hasn't been strategic enough," charges Australian Conservation Foundation director Don Henry. "It was spread across the continent like Vegemite. They need to focus and concentrate their efforts on the big picture problems. And that's particularly true of northern Australia."

The NHT now stands ready to move into Stage II where it will begin spending another \$1 billion on environmental projects. However, the hundreds of projects about to start have been delayed by a funding wrangle between the Federal Government and the states. While NHT Stage I was funded by the sale of Telstra, NHT Stage II will be financed from Commonwealth coffers. Canberra demands that most of those funds be matched dollar for dollar from the States. Before Stage II can begin funding agreements must be reached.

The NHT was initiated by the Howard Government in 1996 to fund community-based projects, many directly

involved with planting trees and land regeneration. The emphasis was placed on producing what its overview called "effective, on-ground activity . . . no unnecessary studies, no more talk. Action." It produced an enormous effort with dozens of undertakings taking shape such as a fire-management project in the Kimberley, the Enoggera Reservoir Rainforest Rehabilitation Project in Queensland and Integrated Rangeland management in the Victoria River District of the Northern Territory.

The Federal Government was satisfied with the results. Both the Federal Ministers for Agriculture and the Environment, Warren Truss and David Kemp, have expressed support publicly for the NHT. The greatest success of the program, said Warren Truss, was "the heightened community awareness of environmental issues and the desire of people to lend their own effort to achieving better outcomes in their own communities."

But some environmental professionals and political rivals disagreed. They saw it as a populist pay-out that achieved few national goals. "I think a lot of the money was wasted, to be perfectly frank," said Queensland Premier Peter Beattie on ABC TV.

Critical Reviews

The NHT's own Midterm Review, published late last year, was also highly critical of the program. The comprehensive review contained 28 separate reports and more than 600 individual recommendations. The review stated emphatically that the NHT needs to refocus its efforts on regional

State of the Environment 2001: the good, the bad

AUSTRALIA'S State of the Environment (SoE) Report 2001, is the second comprehensive, independent, national environmental assessment. Prepared by the Australian State of the Environment Committee, the report gives a broad nod of approval to the Natural Heritage Trust, noting that through it, almost 400,000 Australians became involved in conserving the environment in the past five years, planting 29 million seedlings, replanting and protecting 780,000 hectares of native vegetation, protecting or regenerating 480,000 hectares to conserve native species, erecting 19,000 kilometres of protective fencing, and protecting waterways with 5000 kilometres of fencing.

Overall it seems that there have been areas of real progress in addressing the environmental pressures identified in the 1996 SoE. Unsurprisingly, the committee reports that many of the key threats still persist including salinity, changing hydrological conditions, land clearing and fragmentation of ecosystems; loss of vegetative cover, with broadacre clearing continuing, particularly in Queensland and NSW. Following is a snapshot of findings from two of the report's seven themes, Land and Biodiversity.

Land

On the positive side

- Compared with SoE (1996), much of Australia has better vegetative cover because of: several good seasons (La Niña years) after droughts in the early 1990s; reduced sheep numbers (by 30%) since the late 1980s; reduced rabbit numbers (up to 90%) from rabbit calicivirus disease (RCD), particularly in arid areas.
- Indigenous involvement in land management has a higher profile than it did five years ago. Indigenous knowledge is being better integrated into policies and programs.

On the negative side

- There is still a net loss of vegetative cover. Broadacre land clearing continues in Queensland and New South Wales. However, it is difficult to verify the land areas that have been cleared since 1996.
- Land degradation, including erosion, is still a major contributor of turbidity, nutrients and pesticides to waterways, as well as loss of soil fertility.
- Altered fire and grazing regimes, pests and weeds continue to affect the health of the rangelands.
- Large areas of acidic and sodic soils contribute to poor water quality, secondary salinity and loss of ecosystem function.

Uncertain news

- Since the 1960s, there has been a dramatic increase in pesticide use, but regular monitoring in inland waters and in groundwater is uncommon. The effects on the environment are uncertain.
- Because of lack of data on the number, location and status of contaminated sites, the environmental effects associated with these sites remain unknown.

Biodiversity

On the positive side

- The protection of biodiversity values in Australia has progressed significantly with the enactment of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- A wide range of people and organisations are involved in protecting Australia's biodiversity (e.g. Landcare, Bushcare and Land for Wildlife). The Natural Heritage Trust has funded many of these programs since 1997.
- Protection of biodiversity values now extends well beyond the reserve system into many non-reserve areas. The comprehensiveness and adequacy of the reserve system has improved.
- In early 2001, the Commonwealth government de-

Continued page 6

Australia rather than localised projects. They also found it to be decidedly southern-centric. "If the NHT is forward looking," observed the Review bluntly, "it will identify the major resource development opportunities in some areas of northern Australia and seek to support the prevention of natural resource degradation. This is normally much cheaper than treating the symptoms."

The Review stressed the need for more integrated projects producing measurable outcomes.

While tree-planting exercises were valuable, conservation groups are concerned that excessive land clearing continues unhindered. "The midterm NHT report showed that for every tree that was planted a hundred

were bulldozed," said Mr Henry. "It showed a lack of action by government, both at the federal and state level, to support community effort." Many, including Premier Beattie, believe that NHT funds should be used to subsidise graziers to discontinue clearing native bushland.

Critics say that while NHT Stage I mobilised Australians into environmental action, it fell short of the major ecological goals it had set for itself. According to Minister Truss, that assessment has not been lost on the Federal Government as they set sail on Stage II.

"The new NHT will be much more regionally focused with projects being identified at the local level and funding going to achieving larger-

scale objectives," said Mr Truss.

"The small projects in isolation can achieve worthwhile outcomes but one of the things we've learned is to set broader objectives to make sure that the work that's undertaken is part of a much wider regional plan."

Meanwhile, while the Commonwealth and the States are wrangling over the funding arrangements, many regional groups and resource management agencies are still in the dark as to what preparations they should be making.

Natural Heritage Trust is jointly administered by Agriculture, Fisheries and Forestry Australia and Environment Australia

More information: Natural Heritage Trust <www.nht.gov.au>

Leader appointed for CRC learning theme

AFTER a long search, the new leader for the TS–CRC’s research theme, Human Capability Development, has been found. Professor Ian Falk will begin in his role as theme leader on May 6. Ian is currently the Director of the National Centre for Research and Learning in Regional Australia at the University of Tasmania. As well as leading the new theme, he has also been appointed as the new Chair of Rural and Remote Education at the Northern Territory University.

Ian will be developing a research program that both integrates the work of the new Chair and the CRC’s theme. One of the most significant challenges his new position faces is developing programs that will help different communities across the north to take part in education processes, as well as taking up research outcomes developed by the CRC.

Ian is looking forward to the new position enormously.

“It’s the kind of challenge I’ve always wanted,” he said. “To develop a coherent and integrated research program that has the potential to impact on a wide range of disciplines and practice as well as policy in northern Australia.”

The CRC’s theme on Human Capability Development will encompass many different learning and communication activities, including meeting challenges faced by those in remote and rural areas, building capacity in indigenous, remote and rural communities, and developing practical ways to implement informal learning processes.

Ian believes one of the keys to succeeding in all of these areas is to respect the different values held by all groups across northern Australia.

“There are different capabilities for individuals, communities and the larger society,” he said. “My aim is to work with all these different values and capabilities to

try and achieve some outcomes that everyone values, needs and wants.”

“In essence, capacity building is as much about building people’s and communities’ identities and collective vision and energy as it is about building the capacity of the territory or region as a whole,” he explained.

In the area of vocational and adult education, Ian thinks these terms might be too narrow for the kind of research agenda he hopes to develop with the CRC and NTU.

“Eighty-five per cent of all adult learning is informal—and this is the way adults learn most and best,” he explained. “We will be investigating practical ways in which these informal learning processes provide better participation in the civic processes of northern Australia.”

Ian has spent the past nine years in Tasmania and says there are many points of similarities between the Apple Isle and the remote north. In fact, he thinks a sister-city relationship could even be developed between Launceston and Darwin.

“Each is an island in its own way—Launceston and Darwin are the same size, have the same type of profile in terms of ‘state’ infrastructure, business and education. In each case, the universities are the only ones serving the state or territory.”

“The differences are clear, but only serve to show how similar the two places are,” he said. “This would provide an excellent basis for a sister-city type relationship, where universities, local governments, business areas and so on could fruitfully learn from each other.”

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State of the Environment 2001: the good and the bad

clared land clearance as a key threatening process (under the EPBC Act) to biodiversity.

- Industries have developed codes of practice on environmental management and employ biologists to evaluate biological values in many parts of Australia, rather than relying solely on biologists employed in public sector agencies.

On the negative side

- Many key threats to biodiversity identified in SoE (1996) persist. Processes such as changing hydrological conditions, salinity, land clearing and fragmentation of ecosystems still pose major problems for protecting biodiversity.
- Acceleration in land clearing, with as much cleared during the last 50 years as in the 150 years before 1945.

- The loss and depletion of plant species through clearance destroys the habitat for thousands of other species.

- Dryland salinity, one of the legacies of broadacre land clearing, is predicted to affect some 2 million hectares of native vegetation by 2050.

- There is still limited knowledge on many biodiversity values in Australia.

- Exotic organisms identified as a major threat to biodiversity in SoE (1996) remain so. Invasive species such as weeds and insects pose serious problems.

Uncertain news

- Although fire mapping has improved, the effect of various fire regimes on the conservation of biodiversity remains uncertain.

SoE 2001 Reporting Themes

- Atmosphere;
- Biodiversity;
- Coasts and Oceans;
- Human Settlements;
- Inland Waters;
- Land; and
- Natural and Cultural Heritage.

The report is a bound colour volume with a CD–ROM of the seven theme reports. Hardcopies (black and white) of the theme reports and CD-ROM can also be ordered.

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<www.publish.csiro.au>

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Environment Australia
<www.ea.gov.au/soe>



The Northern Australia Beef Industry Conference (NABIC) held in Kununurra in November 2001, provided a chance for northern producers and researchers to get together and set directions for future research in the industry. *Savanna Links* spoke to the main organiser, Kaz Price, from Department of Agriculture—WA.

Beef industry needs profits to be sustainable

What were the take-home messages from the conference?

Firstly, that sustainability must be linked to profitability. Producers will be more prepared to institute Environmental Management Systems (EMS) and other Natural Resource Management (NRM) strategies if it can be demonstrated that it will link back to profitability. NRM will have long-term benefits for marketing their produce and environmental benefits as well. Secondly, a warning about market complacency: delegates were reminded that our live export industries deal in volatile economies and new market development and maintaining market access was critical.

That first message implies that there's still a gap between sustainable land management research and its relevance to the producer.

Yes there is, and that came up in the 'Increasing Producer Demand for Knowledge' session. This session was about the fact that producers just aren't taking up specific bundles of information, perhaps because it's not marketed correctly and not hitting the appropriate target group.

Any explanation for why that might be the case? Because this gap has been talked about for some time.

I really think there is an issue with the uptake of learning generally, for example, the sort of work that Allan Arnott (TS-CRC and Northern Territory University) identifies, that there are specific groups that producers are more likely to take up knowledge from, such as other producers.

It's also about the ability to use new knowledge—one thing that came out in the NRM session was that big company properties can put new research into practice much more easily than an individual owner-operator.

Given that there are a lot of owner-operators out there, is a different approach needed for them?

To be honest, I think that the company properties are going to demonstrate the sort of improvement that will encourage owner-operators to follow them, for example, the work that Heytesbury and NAPCO are doing.

Aside from the large companies, is there anything that government extension services are doing that has been well received by producers?

Yes. One example was the work that Hugh Pringle and Ken Tinley from CALM are involved in with the Environmental Management Unit out of Kalgoorlie. Their

work is very much a genuine partnership where they are getting the existing knowledge of the producer to align with the theoretical knowledge held in mapping systems and Geographic Information Systems (GIS). This will help establish management plans for properties that take into account land systems and waters, with production plans that the producer wants. They've got enough runs on the board now so that producers are approaching them.

The other thing that seemed to come out was the importance of targeting environmental information.

Yes, training has to be more specifically targeted in terms of people's needs, training that is 'just-in-time' where people can get what is relevant at the time. It may be as basic as a group doing a GIS course to be of practical help in their EMS. Or it might be a course that links EMS with how markets work, perhaps how Asian markets work.

There were also suggestions that the more applicable training units were going to be those that were developed in consultation with industry. At one workshop people were looking forward to a forthcoming MLA educational product—Edge Network—which had been produced in consultation and collaboration with industry.

Also it was mentioned that training courses have to be held at the right time of year.

Seasonality is important. There's a feeling that, especially for owner-operators, if courses continue to be run in the dry season, they have to accept that they're not going to get a huge roll-up of people because that's right in the middle of their main production period.

Any final points Kaz?

People were adamant that this style of conference continued, that the MLA run it every two years, and it be hosted in turn by the WA Department of Agriculture and the Qld and NT Departments of Primary Industry.

For copies of conference proceedings contact: Kaz Price, AGWEST
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The conference was organised by AGWEST and supported by Meat & Livestock Australia and the TS-CRC.

For a summary of Dr. Allan Arnott's work, see *Savanna Links*, Issue 16, Oct-Dec. 2000, *Stories of learning and change in northern Australia's pastoral industry*, pp 4-5. Web: <savanna.ntu.edu.au> go to Savanna Links. Also see our Research Section.

Grasstrees help track fire history and carbon stores

Researchers are using one of Cape York's most ancient plants to help them decide whether Queensland's savannas have a carbon sink that can be used in national carbon budgets.

Carbon sinks—a term that describes carbon taken from the atmosphere by plants and stored below and above ground in the ecosystem—may help stabilise concentrations of carbon dioxide in the atmosphere, and could form part of an international trading system based on carbon credits.

The project, part of the CRC for Greenhouse Accounting's research program, aims to determine whether there really has been tree invasion and thickening across large areas of Queensland. Researchers from the CRC for Greenhouse Accounting, and Queensland Departments of Primary Industries, Natural Resources & Mines and Parks & Wildlife Service, are using grasstrees, which dot the landscape across large sectors of Cape York Peninsula, as an indicator of past fire regimes. These in turn will then give an indication of the region's vegetative history.

Soil carbon analysis is also being used to investigate whether a site was more grassy or woody in the past.

Cape York the key

Pasture ecologist, Steven Bray, from DPI in Rockhampton, undertook a 10-day field trip to Artemis station in central Cape York adjacent to Princess Charlotte Bay last year.

"Cape York was selected as a starting point for the vegetation and soil sampling because of the known changes from open grasslands to an invasion and thickening of tea tree (melaleuca) woodlands," he said.

Researchers believe this tea tree invasion from the coast to the foothills of inland ranges is linked to a reduced number of fires. These fires previously prevented the spread and thickening of timber regrowth. The suppression of fires may have been triggered by the introduction of cattle in the last 50 to 100 years, which reduced the amount of grass fuel for fires. Property managers have also sought to control and restrict fire to conserve pasture.

To see if fires have indeed been reduced, researchers will examine the grasstrees.

"Grasstrees up to 2 metres high are around 150 years old and by grinding back one face of the plant trunk, there are visible growth bands interspersed with tell-tale



DPI pasture ecologist Steven Bray points out the telltale black bands that indicate fire events within the annual growth rings on a grastree trunk

Photo: Russ Boadle

black bands to clearly define fire frequency," Steven explained.

So in Cape York researchers may be able to match a known fire history as revealed by the grasstrees, with a known history of vegetation change. If similar fire histories are found in other grasstrees around Queensland, it may imply similar vegetation thickening has occurred.

"Once we've decided that the techniques are robust enough, there will be further studies undertaken on sites around Queensland," Steven said. These sites may include mulga scrublands in the St George district, Mitchell grass plains invaded by gidgee at Longreach and eucalypt woodlands that seem to have thickened in central Queensland. If there has been a widespread invasion of tree species into former grasslands or thickening up of open woodlands, this could imply there is an extensive carbon sink across a wide sector of northern Australia.

This carbon sink is currently not included in national carbon budgets.

Grasstrees collected from Artemis station are now being analysed along with soil samples, and some results are expected by June. The soils are being tested by scientists from CSIRO Land & Water, Adelaide, Australian National University, and Queensland Departments of Natural Resources & Mines and Primary Industries.

More information: Steven Bray, Qld Dept. Primary Industries

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CRC for Greenhouse Accounting <www.greenhouse.crc.org.au/>

To read about carbon sinks, credits and the Greenhouse gases, Click on eCarbon FAQs

How carbon sinks can help combat global warming

As part of what is called the 'global carbon cycle', carbon is exchanged naturally between the land, the atmosphere and the oceans. Forest sinks play a very important role in this natural ecological cycle and can combat global warming by removing CO₂ from the atmosphere and storing

the carbon. But, forest sinks can only offset a relatively small proportion of total greenhouse gas emissions. We cannot combat global warming with forest sinks alone. We also must reduce our industrial emissions.

As a matter of necessity, we fundamentally need to change the

way that we choose to produce and use energy as well as massively reduce our levels of fossil fuel consumption. These changes will be difficult and will take many years. Forest sinks start working immediately, providing the time needed for slower industrial change.

—CRC for Greenhouse Accounting website

Traditional fire sparks study in the wild country

Tom Vigilante is a PhD student from the Northern Territory University who chose to study fire management in one of the most remote parts of Australia. Tom's project examines the impact of fire on the plant communities and indigenous natural resources around Kalumburu in the northern Kimberley. *Savanna Links* spoke to Tom about his Kimberley experience.

Tom, apparently you had connections in the Kimberley already?

Yes, my grandfather had been working in Kimberley for more than 20 years—he was a gardener at the mission station at Kalumburu. He was getting fairly old, so in the mid-90s I decided to go up with him, thinking it might be my last chance. I went to Kalumburu for two weeks. I had a really good look at the place and liked it and got to know quite a few people there.

What was it like on field trips?

A lot of the survey work I did myself, but then I needed to compare burnt areas and those that were less visited and less burnt, so I did three big trips where I went around the coastline to remote areas. That involved hiring someone from the community to take me in a boat. Some of the blokes from the community were also employed to come along and showed me where to go safely in their country. Some were really experienced in that place and made a lot of the decisions but for others it was their first time—I think they liked the chance to see those places and I was able to explain what this project was about and hear some of their ideas.

Did you find the trips 'eye opening'?

Yes, their whole outlook on things is different. When we'd go to a new camp, the first thing they'd want to do is clean up around the site, and this might include burning bush around the camp. But I wanted to survey the trees before they were burnt so we had to compromise a bit. Also before we'd leave, we'd burn. I soon learnt to respect their local knowledge and experience because things can easily go wrong in such remote places. The country is really wild. There seem to be spiritual dangers in the landscape as well as the physical ones, and that takes a bit to understand.

What sort of reasons were there for burning?

The reasons were varied. One of the major uses in the past was fire drives, where animals were driven towards the hunters. Today there is more emphasis on individual hunting and making the landscape easier to hunt in. For example, they use fire to manage animals in the landscape by bringing them out of the hills into the lowlands. They also clear grass so you can walk through it and see kangaroos and things like that.

Did it take a while to develop trust between the community and yourself?

Knowing my grandfather was a good starting point – people can work out who you are. Particularly the old people. I spent a lot of time recording older people's

accounts of burning in the past and why they burn today. Some were really happy to work with me, while some had other commitments. I was able to pay people for their time because of a grant from AIATSIS (Australian Institute of Aboriginal & Torres Strait Islander Studies), but there was a lot of good will towards the work.

What were your broad findings?

The clear things that are showing up were that fire varies between the sandstone of the Kimberley plateau and the volcanic basalt landscapes. The basalt country forms these hills on top of the sandstone bedrock, and in the lowlands they form black soil plains and red soils. Most of the pastoral enterprises are on the basalt soils because they have the perennial grasses. The basalt areas have the most extreme fire regime—very frequent and often very late. But they also have productive grasses and tend to be in open savanna; pretty much grass and eucalypts. It's got a fairly extreme regime but it's also fire-adapted.

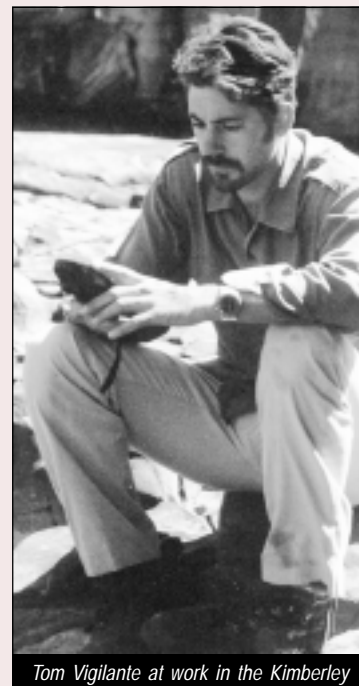
The other system is the sandstone and the associated sand plain, the alluvial sand that comes off the sandstone. They had lower fire frequencies, but a larger range of mid-storey trees and shrubs that are more sensitive to fire.

Where do you go from here as far as getting information back to community?

It will probably end up being a combination—maybe a presentation with a video and a booklet, so that through doing it a few different ways, hopefully everyone in the community will come into contact with the information. So I hope to go back to the community at the end of the project and take back the results and spend time there disseminating it, and then wait around for people to respond. I may need to make some changes to the information, or they might give me some feedback as to what other information might be relevant.

Tom studies at the Centre for Indigenous Natural and Cultural Resource Management at NTU. His project is supported by the TS-CRC as well as by the Kimberley Land Council, and the Wunambal-Gambara and Balangarra Associations who represent traditional owners on issues relating to land management in this region.

Read about all TS-CRC student projects on our website, under the Education Section and then by clicking on 'Students.' Go to: <savanna.ntu.edu.au>



Tom Vigilante at work in the Kimberley

Photo: Jon Marsh

NT breakthrough for mining

THE Northern Land Council and mining giant Rio Tinto have reached an agreement that paves the way for the approval of about 50 exploration licences on Native Title land in the Northern Territory. The licence applications cover an area of some 31,000 square kilometres. Much of the exploration will follow known 'envelopes' of micro-diamonds which can apparently indicate the presence of diamonds.

The new agreement marks the end of a stand-off between the NT's former Country Liberal Party (CLP) government and the NLC which saw a halt to processing of applications in 1996. The agreement claims to guarantee indigenous site protection, community benefits including employment and training opportunities and strong environmental protection for exploration projects.

Rainforests harvest the skies

UPLAND rainforests harvest vast amounts of water from the clouds in addition to what falls directly as rain, north Australian researchers have discovered, adding billions of litres of extra flow into tropical river systems. The finding has major implications for the care and management of the world's remaining rainforests and tropical river systems, as well as global water security.

Dr Reddell and Dr David McJannet lead a team in the Rainforest CRC, involving scientists from CSIRO and James Cook University. Early indications are showing that rainforests may pull up to 40 per cent more water out of the clouds than is measured as rainfall in a rain gauge.

Go to: Rainforest CRC
<www.rainforest-crc.jcu.edu.au>

Goat exports increase

VIETNAM is emerging as a potential new market for Queensland's live-stock sector with goat meat now added to shipments of live beef and dairy cattle. According to the Queensland Government, the state's goat meat exports increased by more than \$13 million last financial year. Taiwan and the United States are currently the dominant buyers of Australian goat meat, but two shipments of goat meat were recently exported to Vietnam. Australia's total goat exports are valued at about \$40 million.



The NORFORCE crest, above, and at right, PTE Edgar Garramurka, from NORFORCE, performing the White Cockatoo and the Bioga Dance on the Didgerido, at the Australian Army's Centenary 2001



Photo: SGT W Guthrie

TOP END special unit takes on more recruits

NORFORCE, a specialist army unit operating in remote areas of the Northern Territory and the Kimberley, is to start training more Aboriginal recruits.

The North West Mobile Force conducts surveillance and reconnaissance over a vast area of northern Australia; more than 1.8 million square kilometres in an area stretching from Alice Springs to Broome in the west, the Gulf of Carpentaria and the wetlands of Arnhem Land.

NORFORCE operates in conjunction with two other Regional Force Surveillance Units, the Pilbara regiment in WA and the 51 Far North Queensland regiment which covers Cape York, the Gulf and the Torres Strait Islands.

The unit was raised in 1981, but traces its history to the 2/1 North Australia Observer Unit formed in 1942, in response to the threat to Australia's north posed by Japan during WW II. These men, who often worked for months on end in some of the nation's harshest and most isolated areas, were known colloquially as the 'Nackeroos'.

Like their predecessors, their role is not to engage a hostile enemy, but instead to locate and observe them. With a core of 50 full-time personnel, most of NORFORCE's 600 soldiers are Reservists, and almost 50 per cent are Aboriginal. The Unit celebrated its 20th anniversary of service to the Top End in July last year.

Go to: <www.defence.gov.au>

Trainspotters ahoy

THE first piece of track was laid for the Adelaide to Darwin railway at a ceremony in Katherine on 8 April. NT Chief Minister Clare Martin, SA Premier Mike Rann and Senator Ron Boswell (representing the Prime Minister) unveiled a plaque to mark the occasion. The SA-NT railway is due to be finished by 2004. Track will be initially laid south of Katherine and north of Tennant Creek. Tracklaying then starts north of Katherine towards Darwin and south of Tennant Creek towards Alice Springs in 12 months.

Go to: AustralAsia Railway Corporation
<www.aarc.com.au>

Feral dogs

A ONE-off, large-scale dog baiting campaign is on the books for Queensland's state parks. The campaign aims to reduce the growing population of wild dogs in the state's west. Of the approximate 15 million ha managed by the State's agencies about 11.4 million ha is native forest and national parks. Wild dogs are now a problem in these parks, and producers say their efforts to reduce the animals on their own properties are being undermined by those breeding and living in the state's parks. 1080 baits will be distributed by air.

May

7th International Association of Hydrogeologists (IAH) conference:

Balancing the groundwater budget 12–17 May, Darwin

Venue: Carlton Hotel, Darwin, NT

Conference streams are Resource quantification/water balances; Modelling groundwater resources; and Ecosystem dependence. Keynote speakers from 10 countries will lead sessions.

Contact: Des Yin Foo **Fax:** (08) 8999 3666

Email: des.yinfoo@nt.gov.au

Web: www.octa4.net/iahnt/conference.htm

Centre for Groundwater Studies Workshops 13 May, Darwin

Venue: Northern Territory University, Darwin

Series of four half-day workshops being held in conjunction with the IAH International Groundwater conference. Topics include groundwater chemistry and environmental isotopes in groundwater and surface water/groundwater interaction and ecosystem dependence on groundwater. All-inclusive fees are \$200 per workshop.

Contact: Trevor Pillar **Tel:** (08) 8201 5632

Email: trevor.pillar@flinders.edu.au

Web: www.groundwater.com.au

North Queensland Field Days 15–16 May, Townsville

Venue: Stuart Prison Reserve

This biennial event is the largest field days in regional Queensland. It draws visitors from all over rural and remote Queensland. Numerous displays on farming equipment, animals and products and natural resource management issues.

Contact: Leanne McCann **Tel:** (07) 4721 2125

CRC Association Conference 21–23 May, Sydney

Venue: Sydney Convention Centre

The theme is CRCs: Capturing Creativity—through People, Ideas, Enterprise

The conference aims to promote the CRC Program through CRC Achievements; involve key stake holders and decision makers and enhance networking for CRCs to facilitate self-help.

Web: www.crca.asn.au

Green Processing 2002 29–31 May, Cairns

Venue: Cairns Convention Centre

Theme: Sustainable processing of minerals

The conference will examine drivers for sustainability in the minerals processing industry, evaluate industry needs now and in the future.

Contact: AusIMM Events Department

Tel: (03) 9662 3166 **Fax:** (03) 9662 3662

Email: events@ausimm.com.au **Web:** www.ausimm.com

Environmental Conference Environmental Solutions: Meeting the challenge in 2002 30–31 May, Brisbane

Venue: Brisbane Convention and Exhibition Centre

Sponsored by the Environmental Engineering Society (Qld Chapter), the conference will include keynote speakers, more than 100 technical papers, and a trade exhibition featuring environmental products and services.

Contact: Conference Coordinator, Coleen Hanahan

Tel: (07) 35510 2114

Email: email admin@eesq.com.au **Web:** www.eesq.com.au

July

Savanna Landscapes in Northern Australia—fire and heterogeneity 8–12 July, Darwin

Venue: Northern Territory University, Darwin

Held by the Tropical Savannas CRC and the ARC Key Centre for Tropical Wildlife Management, this conference and linked workshops examine the management of fire and its implications for wildlife. The insights of a large number of experienced northern Australian researchers and resource managers will be supplemented by international guests, who will help place the north Australian experience in a global context. The conference and workshops are built around two main themes:

- **Theme 1, 8–9 July:** Fire and savanna landscapes in northern Australia—regional lessons and global challenges
- **Theme 2, 11–12 July:** Managing for heterogeneity—maintaining savanna wildlife

Contact: Julian Gorman

Fax: (08) 89346 7088

Email: julian.gorman@ntu.edu.au

Web: www.wildlife.ntu.edu.au/activities1.html

Landcare and Catchment Management Qld State Conference: Innovation in Action 21–24 July, Townsville

Venue: Jupiters Casino and Convention Centre, Townsville

The conference seeks innovative solutions to landcare and catchment management issues, and will focus on hands-on activities under the theme Innovation in Action.

Contact: Arwen Rickert, Program Extension Officer (Landcare/ICM), NRM, Townsville. **Tel:** (07) 4799 7303

Email: Arwen.Rickert@dnr.qld.gov.au

Web: www.burdekindrytropics.org.au

Valuing the Environment 25–26 July, Brisbane

For those interested in assessing economic and social values relating to the environment: reserves, rural, urban, wilderness, wetland, and National Parks.

Email: teroma@coffs.com.au

Web: www.teroma.coffs.com.au

August

Garma Festival of Traditional Culture & Djakamirri Wangawu 'Caring for Country' Forum 13–17 August, Arnhem Land, NT

Venue: Gulkula, Gove Peninsula, NT

The Garma Festival celebrates the cultural inheritance of the Yolngu People of North East Arnhem Land and is open to both indigenous and non-indigenous people. This year's forum is Djakamirri Wangawu ('caring for country') and will examine issues such as: Caring for Country; traditional ecological knowledge; and developments in ecotourism.

Email: yyf@bigpond.com.

Web: www.garma.telstra.com/forum.htm
www.garma.telstra.com/garma2002_we.htm

September

Australasian Remote Sensing Conference: 'Images to Information' 2–6 September, Brisbane

Venue: Sheraton Hotel, Brisbane

This conference will draw together remote sensing applications in a wide range of commercial, government and research applications, with the latest developments in image acquisition, distribution and processing.

Contact: Australian Convention & Travel

Postal: GPO Box 2200 Canberra ACT 2601

Tel: (02) 6257 3299 **Fax:** (02) 6257 3299

Email: 11arspc@ausconvservices.com.au

Web: www.geosp.uq.edu.au/11arspc

13th Australian Weeds Conference 8–12 September, Perth

Venue: Sheraton Perth Hotel, WA.

Theme: Weeds: threats now, and forever?

Host: Plant Protection Society of WA Inc.

Contact: Convention Link

Postal: PO Box 257, South Perth, WA 6151

Tel: (08) 9450 1662 **Fax:** (08) 9450 2942

Email: convlink@inet.net.au

Web: members.iinet.net.au/~weeds

3rd International Symposium on the management of *Mimosa pigra* 23–28 September, Darwin

Venue: Northern Territory University

Held by the Australian Mimosa Management Committee, the aim to share and document advances in managing the weed. Participants wishing to present a paper and/or a poster should also submit abstracts by 30 June 2002.

Contact: Maryanne McKaige, Coordinator
Centre for Tropical Wetlands Management

Postal: NTU, DARWIN NT 0909

Tel: (08) 8946 6726 **Fax:** (08) 8946 6847

Email: ctwm@ntu.edu.au

Web: savanna.ntu.edu.au/news/calendar.html

Australasian Fire Authorities Council (AFAC) Conference 27–29 September, Gold Coast

Venue: Conrad Jupiters on the Gold Coast

Conference Theme: Hunting for Gold—Innovation and Best Practice. The conference brings together fire and emergency service agencies from Australia, New Zealand and Hong Kong.

Contact: Australasian Fire Authorities Council (AFAC) Conference 2002

C/ Intermedia Convention & Event Management

Postal: PO Box 1280 MILTON QLD 4064

Email: afac2002@im.com.au

Web: www.fire.qld.gov.au/afac

December

Australasian Wildlife Management Society 2002 conference 9–11 December, Sydney

Venue: University of Sydney, Camden Vet Science Campus (about 30 km west of Sydney).

Web: www.awms.org/conferences.html

Savanna Links is edited and produced by the Tropical Savannas CRC. Articles can be used with permission of the TS-CRC.

Please email, or call numbers at right. Views expressed in *Savanna Links* are not necessarily those of the TS-CRC.

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