

*City of Salisbury, FORUM 2014, March 13 – 14, Mawson Lakes: Fire management within Grassland Ecosystems*



**Local fire management since 1836: Northern Adelaide Plains**

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flame heath, *Astroloma conostephioides**

**Introduction and Acknowledgement; Welcome and thanks**

First people and custodians of this country: Kurna people, Kurna country, future youth

**Purpose of this talk: fire must be managed locally**

Background of fire management - before 1836

Fire management after 1836 – to the present

Future of fire management on Kurna Plains – depends on biodiversity restoration and return of the fire keepers: water rat (*Hydromys*) & *Kondoli*

**Background – Fire management before 1836; published resources:**

Darrell Kraehenbuehl (1996) “Pre-European vegetation of Adelaide” reconstructed original veg:

Bands of vegetation, with topography: foothills mallee, plains of grass, marshes of reeds

Managed forest patches (Peachy Belt, Black Forest, The Pinery); river corridors of gums

Philip Clarke (2011) “Aboriginal people and their plants”

Marshes of Adelaide, reed men *wito majunna*

Expansive grasslands, grass-seed gatherers, *pauara*

Mallee box woodlands, *Mullawirraburka*, TFK

Kurna elders, culture & fire technology persist today with the descendants

Dreaming fire stories: water rat & quondong, whale & yakka

Bill Gammage (2011) “The biggest estate on earth”; Adrian Shackley (2012)

Paintings from Art Gallery of SA (1935) by Martha Berkeley 1839; diaries & land records

Evidence of extensive land management with fire, for grasslands

Trove.nla.gov.au/newspaper (The National Library – online)

SA Register (1839 – 1900) – articles of bias in times of trouble; SA Magazine;

The Advertiser (1900 to present) – articles reflect the times

Province of South Australia 1836. Letters Patent (King William 4<sup>th</sup> protected Aboriginal rights)

**Aboriginal fire management, Traditional Ecological Knowledge (TEK) 1836**

Climate experts: 35° S Latitude, extreme summer dry heat, winter wet cold – winds & seasons of plant growth; so FUEL was related to season and plant type

Burning experts: 5000 patch burns per year around Adelaide (Leichardt 1847)

Cultural fires: inherited by TFK, family & landforms were connected;

Provided food and game in abundance, protected the safety of travelers

Rules for living: people inherit responsibility for land in story

*Everything is interrelated: seasons, stars, plants, animals, people*

Summer camp – plains: in swamps & grasslands, reed men & grass men had knowledge of burning

Burned grass upon leaving in Feb-March *Wodliwormngati* (Aboriginal Community C, 1985)

Fresh grass regrowth over winter; returned to the plains in spring *Willutti*

Winter camp – hills: stringybark, box forests, Morialta, Uraidla



Definition of Traditional Ecological Knowledge (TEK) (F. Berkes 2008. “Sacred Ecology”)  
= a cumulative body of knowledge and beliefs handed down for generations by cultural transmission about the relationship of living beings with one another and with their environment  
= the cultural and spiritual way in which indigenous people relate to their ecosystems (LaDuke & Martinez, IPRN/SER, online website); **TFK = Traditional Fire Knowledge**

### Adelaide’s climatic zone: Mediterranean type

Climate determines vegetation (MEDECOS 2014); [www.incomme.org](http://www.incomme.org) (IUCN)  
Fires are inevitable; we should pay for **ecosystem services to moderate fires**  
Kaurna calendar (Scott Heyes 1999, honours project, U of Adelaide)

### Bushfoods

Relaxed lifestyle, abundant food, defined songlines for travel  
Custodianship = regular, intelligent **patch burning**  
Children are taught to find food, independently  
**Berries:** *Nitraria*, *Enchylaena*, *Kunzea*, *Billardiera*, *Carpobrotus*,  
*Santalum*, *Dianella*, *Leucopogon*...  
**Greens:** *Tetragonia*, *Typha*, *Sonchus*, *Apium*  
**Nectar:** *Banksia*, *Xanthorrhoea*  
Wattle gum, truffles...



**Fire management for food:** Dreaming stories – explain how fire got into plants, and humans must release it; ecosystem management

Quondong song – instructions for fire (N. Tindale 1936)

**Water rat, keeper of fire (*rakali*)**, related to quondong (L. Hercus 1986)

Yam daisy – women cultivated and burned patches (Zola & Gott 1992)

Yakka – **fire sticks** release fire stored there, from *Kondoli* (whale); seasonal instructions

Totems instruct management practices and alliances for the welfare of everyone

*Tarnda*, red kangaroo (Adelaide); show respect for the source of meat from the grasslands.

### Fire knowledge & technology

Ecosystem function and instructions were known by TEK/TFK

Fine detail – look for signals from insects, birds, lizards, whales, names of winds, seasons

Looking after country – obligations, alliances for peace

Firesticks – many technologies; trade items

Fire experts = created planned patterns in the landscape; land management benefits all species

Grasslands – on spongy soil, written about by English settlers; cultivated & burnt yam daisy

Woodlands, hills – Peramangk: superior fire expertise (Coles 2010. *The Ochre Warriors*)

Fire regime – knowledge of plant succession & regime (= FITS: frequency, intensity, type, season)

Kaurna fire regimes (suggested FITS) – knowledge is sacred & custodial

**frequency (intervals, fire cycles)**- Diverse: short, long, and none

**intensity (low, medium, high)**- All intensities: grass, high intensity but quick; forest, low & slow

**type (fuel type, vegetation type)**- Most veg types; food plants and sensitive animals protected

**season (spring vs. autumn burns)**- All seasons: grass fires in Feb/Mar;

## Fire management after 1836

1. Conversion of land and people to towns, agriculture, pastoralism, money, religion & language (Governor Hindmarsh proposed “to advance Aborigines & convert them to Christianity”)
  2. Kangaroo grass was consumed by cattle industry, then weed invasion;
  3. Aboriginal burning was criminalised (Willamy jailed 1839 for “maliciously setting fire to grass” at Burnside) (Ellis 1976. “Natural history of Adelaide” RSSA). Kangaroo grass died without fire.
- 1841 *SA Register*: grassfires on the plains were more fierce than the slow hills fires  
1842 *SA Magazine*: “burning clears unwanted grass & weeds” .. article by Anonymous  
1847 First Fire Ordinance: Legislative Council set fine for “reckless & negligent” fire in stubble  
1852 First Councils – only specified hours of burning in summer; first attempt to regulate  
1854 **Bush Fires Act** – specified rural lighting; mistakes were prosecuted  
1855 Protector of Aborigines wrote: “..removal of every Aboriginal from the city.. for cases of misconduct, chiefly setting fire to grass”; at Moorundee Station, “.. Aborigines find constant employment as shepherds ..superior should supplant inferior races.” (*SA Register, 10 March 1855*)  
1893 Fire signaling by Aboriginal stockmen mustering cattle & sheep (thin, blue column of smoke, balloons, puffballs, parallel columns... (WA Horn 1893)

### What happened to TFK?

- 1836 – firestick farming, 5000 patch burns per year  
1837 – Aboriginal population around 14,000 in the province of SA; originally helped the settlers on their land; this changed later after disrespect for waterholes (Mathews 2013, “Chequered Lives”)  
1840-50 16,000 Europeans arrived to buy land (Carter *et al.* 1994, Tauondi Aboriginal College)  
Settlers overturned the old ways: new food, killed too many roos, emus, birds; disease, starvation, exploitation of Aboriginal workers; stopped traditional care of food plants;  
1850 – 180 Kaurna survivors moved to mission farms (Pt. Pearce, Poonindie) to work for colonists  
1850-60 – most land surveyed for pastoral leases (Sheldrick 2013, “Nature’s Line: George Goyder”

### Bushfire volunteers 1880 to 1950

- 1882 – Fire Brigades Board: defence volunteers, post-Crimean war, fearing Russian invasion;  
1885 – the Bush Fires Act was amended to stop the clearing of mallee  
1890 - Agricultural burning prosecuted – Mt. Brown forest/grassland (ironically) (SJ Pyne 1991)  
1913 – Act was revised to allow local councils to appoint Fire Control Officers  
1926 – volunteers organised in coordinated Fire Fighting Associations (volunteers, farmers united)  
1933 – extensive fires from Adelaide Hills to Eyre Pen.  
1934 – Act added big funding for equipment, eg. vehicles, water tanks  
1940s – wartime Civil Defence Force = Emergency Fire Services against the “menace of fires” (equipment/training) (Ellis, J-A 2001. History of the SA CFS)

### Compare types of fire management, with land investment (SJ Pyne 1991 “Bush Fires in Australia”)

- Forestry** – aggressively prevents fire w. plowed breaks; understory burning for fuel reduction  
**Agriculture** – farmers burn boundaries to protect fences & crops; burn stubble & clearings  
**Pastoralism** – converted scrub to pasture by clearing with chains (Angas 1840)  
**Native forests** – “guerilla war,” fighting fire with fire to protect the asset  
**Water catchment** – dilemma to burn/not burn to protect water quality  
**Rural councils** – OK to clear bush for housing; volunteers fight fires  
**Urbanisation** – avoids discussion of fire & plants

Persisting attitudes to burning

No-burn policy

Total suppression

Prescribed burning for fuel breaks, fuel reduction

Fire as an enemy; disaster planning

New options for burning

Fire as a part of the new culture, with climate change

Ecological burning – stimulate fire dependent species

Return land as Indigenous Protected Areas (IPA) for traditional fire knowledge (TFK)

Sustainability principles: economic, social, environment

ecological services; building natural and social capital; only works at local scale/custodians

### **SA is re-connecting people to nature, at a LOCAL level**

SA Urban Forests – [Million Trees Program \(2003-2013\)](#)

Reduce Adelaide's ecological footprint by re-creating natural habitat with local native species

Link patches of remnant vegetation by corridors

Understand biodiversity = sustainability (Rio 1992-2012)

Link schools & community to native plants, habitats

Biodiversity corridors – link woodland, plains, coast, along three rivers

Partnerships for learning & working together (2000+ people; 300 + sites)

### **Adelaide Parklands Restoration (UB Unit 2013); 11 Parks, 35 revegetation projects, >2000 participants**

“..reconstructing native environments consistent with [pre-European vegetation associations](#) and increasing [biodiversity](#) within the Adelaide Park Lands...”

“Fire has also been used for preparation where appropriate, to reduce weed seed burden and biomass and more specifically to assist with [native grass establishment](#). Woody weed removal has been necessary across many sites to improve remnant vegetation and prepare revegetation areas.”

- Large-scale Red Gum Woodland and [riparian restoration](#) programs along the Torrens River at Tainmuddilla (11) and [Tulya Wodli \(Park 27\)](#). Photos of 2005 and 2010 show return of vegetation
- Grey Box Woodland plantings in Tidlangga (Park 9) The Pilgrim Peace Park.
- Revegetation of Mallee Box Woodland in the Western Parks Lands (Park 23 – Wirrarninithi). The millionth tree was planted by Premier Rann in July 2006. Fuel loads increased 2003 to 2013.
- Large community planting events to celebrate National Tree Day, held annually in July.
- The *Adelaide Park Landscape Master Plan* (2011); 30-year Greater Adelaide Plan.

### **Edinburgh and Gawler Corridors**

Habitat links woodlands to plains; Creates biodiversity; Water rat habitat (*Hydromys*), keeper of fire.

Burning the buffer before seeding; Removes fuel & weeds; Yakka habitat, instructions to burn.

Local native plants & animals have relationships to fire and must be managed as climate gets hotter.

Can science predict effects of Climate Change? Increasing extremes and erratic weather (IPCC 2007)

Temperature increase of 1-4°C, due to CO<sub>2</sub>

Shifts climatic zones 1-500 km poleward

Ecosystems must adapt or die! dead fuel buildup

Wildfire & drought create deserts, habitat loss

Low fuel, less fire? **Prediction = resilience**

FIRESCAPE model, CSIRO; Cary, G. 1998. GIS modelling. Fire REGIME now is:

Frequency= average of 50 years; increase frequency to 30years

Intensity = 1800 kWm<sup>-1</sup> to 45,000 max; Season = weeks 49 to 8 (76% of fires)

**Scientific & Indigenous Fire Knowledge** Two knowledge systems: (= resilience?)

1. Indigenous views of indigenous landscape burning (TEK/TFK)

Rose DB. 1996. *Nourishing Terrains*

Anderson A. 1999 Cross-cultural conflicts. *Conservation Ecology*

2. Scientists' views of landscape burning- "Pleistocene overkill" hypothesis by orthodox scholars

Flannery T. 2002 *The Future Eaters*

New evidence for Aboriginal extinction of megafauna by fire (*Nature* 2013)

3. Anthropologists reconcile conflict

Lewis H. 1978 *Fires of Spring* – native people kept mosaics by burning patches in spring.

**Land care: two ways (Samantha Muller 2008. Indigenous Payment for Environmental Services)**

Reading the smoke – IPA returned the correct burning in Cape York IPA; mistakes made by government

Which local model of fire/land management? Aboriginal burning model vs. European no-burn policy

Solutions for the Indigenous Estate: Jon Altman 2010 "The hybrid economy" (CAEPR, ANU)

Hybrid fire/land model; examples of both ways learning:

Emily Ens *et al.* (2012) Two-way learning. *Ecological Management & Restoration*, special issue 13.

Altman & Kerins (2012) *People on Country: vital landscapes, indigenous futures* (CAEPR, ANU).

## Reconciliation & Land Management

Nigel Tucker (2005) Healing country and healing relationships. *ECOLOGICAL MANAGEMENT & RESTORATION* 6, 83-84 Guest Editorial (adjunct JCU, Townsville Qld)

Conservation economy (McDonald 2004 EMR:87)

Culturally appropriate economy (Rainforest CRC & ACF 2003)

"restoring a new ecological balance to the country which nurtures and sustains all cultures"

Native Title homelands need 'European' management: weeds, inappropriate or changed fire regimes, feral animals, over-collection of fuel wood, mining impacts, erosion problems,

uncontrolled tourism; Research & investment are required; Social capital CAN BE profitable

**Land is INSEPARABLE from art, lifestyle, spirituality and ethical practice**

**NCRM = natural & cultural resource management**

Ens EJ *et al.* 2012. *Ecological Management & Restoration* 13:100-107

**Four main issues**

1. philosophy of environmental management – both ways

2. cross-cultural awareness of knowledge & methods

3. two-way approaches to research & managing country

4. operational challenges for NCRM organisations

**Five principles of NCRM for action**

i validate both philosophies

ii create opportunities for cross-cultural understanding, respect

iii involve Indigenous people at all stages

iv allocate time & continuity of effort & resources

v establish high-level govt. commitment to NCRM

### **Future of local fire management**

Climate extremes are inevitable (IPCC 2007)

Renew our knowledge of fire regimes (FITS)

Reconsider Traditional Fire Knowledge (TFK)

Suggestion of a TREATY: Salisbury and Kurna (L. Crocker 2013)

Mutual respect, relationships, responsibilities, commitments; Two-way self determination

Gathering places common ground (seasons, biodiversity)

New culture: ecosystem services, ecological economics, local community identity, TFK

*Rakali*, water rat, the fire keeper, relates to the quondong;

*Kondoli*, the whale, the fire keeper, relates to the yakka tree.