

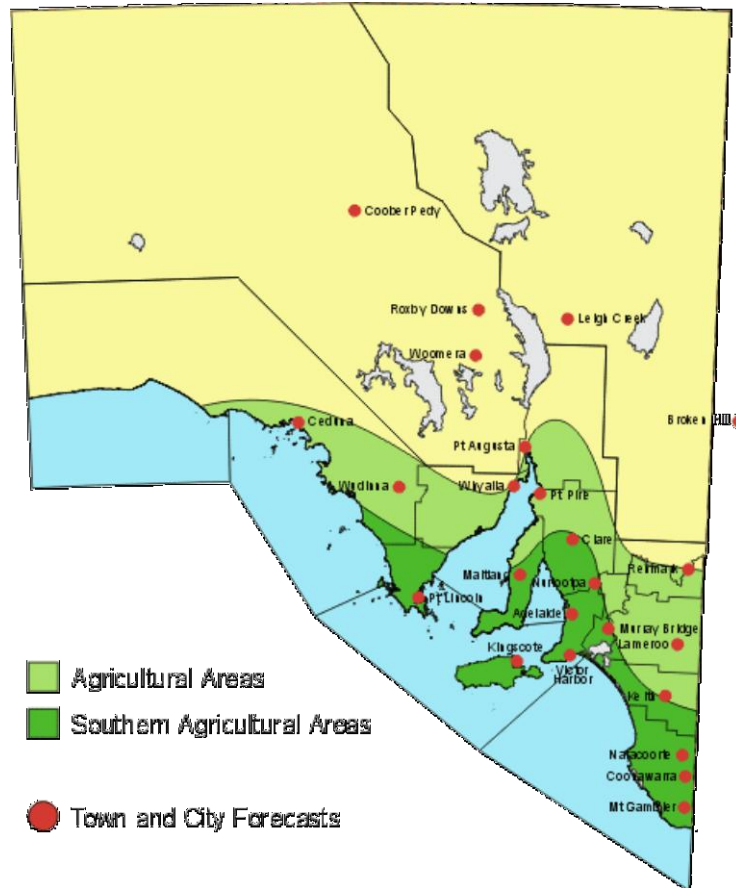
“It looks OK to me”

A personal SA perspective of the science and art of monitoring the rangelands since the 1973 Fowlers Gap rangeland monitoring workshops

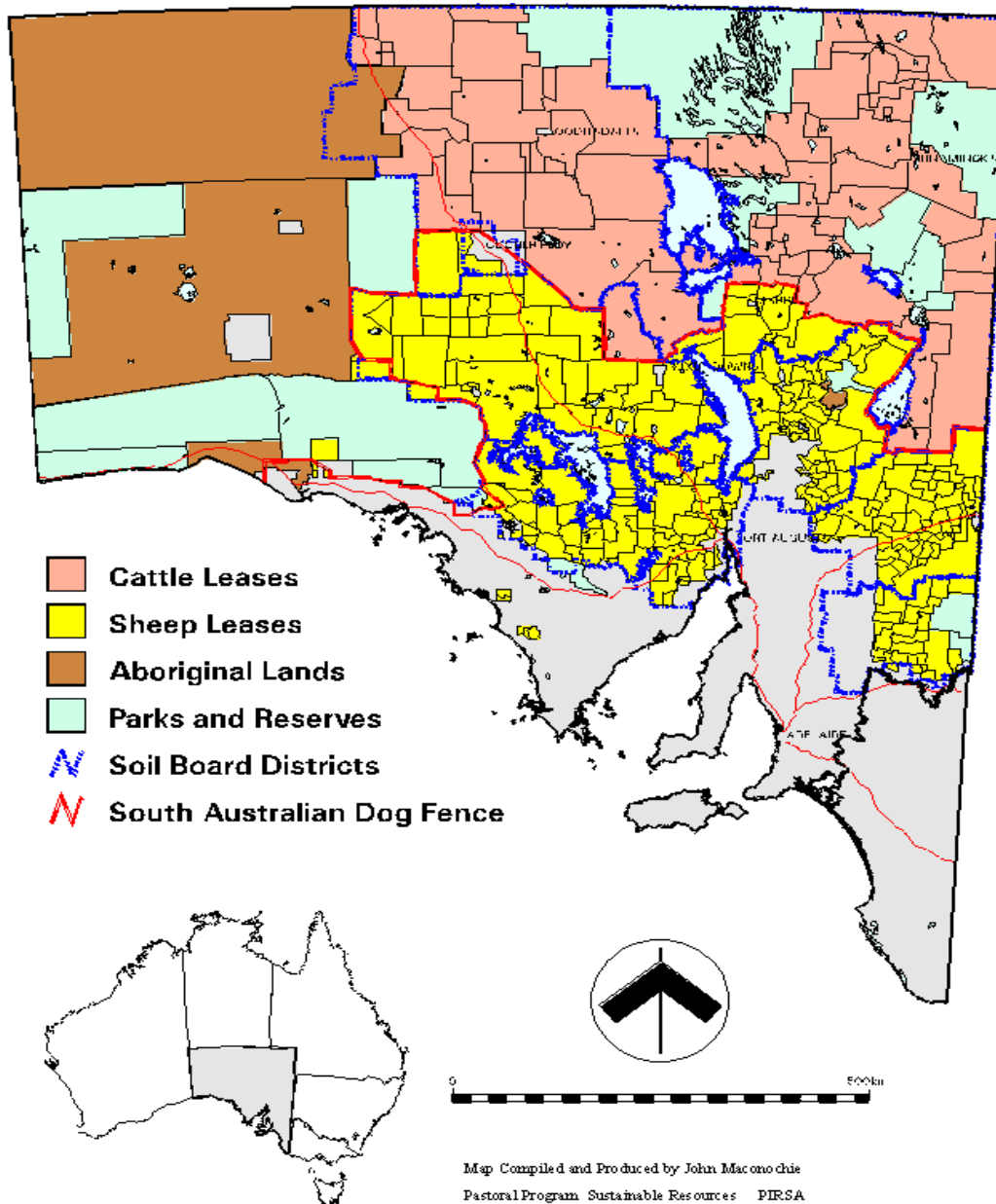
Murrumbidgee Landcare Forum Hay, 8/8/2012

By Brendan Lay, Retired senior scientist , DEWNR

The SA Outback — it's the yellow bit on this map



SOUTH AUSTRALIAN RANGELANDS



Map Compiled and Produced by John Macdonald
 Pastoral Program Sustainable Resources PIRSA

Water erosion – perpetual lease lands in Southern Flinders Ranges



Wind erosion - Willouran Ranges near Marree



SA Arid Lands in good seasons – Belar,
bluebush and flowering sennas, but no herbaceous cover -
Kokatha Stn, Gawler Ranges district



**“The challenge is
separating seasonal
noise from changes
in land condition”**

**Everlastings after
winter rains near
Glendambo**



Fred Jessup and Brendan Lay in 1970

“Calibration” on shrub density survey – note regulation footwear...



A “Jessup track” in 1970

on Millers Creek near Roxby Downs



Pumping fuel and fixing tyres at Muckanippie Outstation in 1971 – note attention to OH&S procedures!



John Potter (my boss) bogged on Millers Creek in 1973 -
“crabhole country”



Bill Matheson (my next boss) in 1979 at Ingomar Station
Different car – same problem...!



Fowlers Gap workshops, May and Sept 1974

- **Organised by SCS Broken Hill**
- **Attended from SA by Bren Lay (Dept of Agriculture), and Bruce Evans (Pastoral Board of SA)**
- **Introduced participants to four Rangeland Condition techniques**
- **Tested these methods on three vegetation communities (Range sites) on Fowlers Gap station - Mitchell grass, Mulga and Saltbush**
- **Three areas in each vegetation type were used, representing good, fair and poor condition in the eyes of the organisers.**
- **The aim was apparently to seek to agree on which method was the best for assessing objectively the condition of the sites on Fowlers Gap**
- **Also it was hoped that we may reach agreement as to which method may hold most promise for development and adoption by the states in their monitoring programmes**
- **Report on the workshops prepared for Pastoral Board in 1974 by Lay and Evans**

Fundamental requirements for any condition method

- Able to separate condition & trend from seasonal noise
- Able to be applied to all land uses and land types.
- Simple to use and understand, esp by the land manager.
- Able to be repeated with minimal observer variability
- Able to stand up to legal and scientific scrutiny, and
- Flexible and logical - able to be improved as further knowledge is obtained

Methods tested at Fowlers Gap

1. Quantitative Climax (Clementian succession as applied to rangelands)
2. Parker 3-step (for assessing condition and trend of Forest ranges in USA)
3. Deming two-phase method for range assessment in USA
4. The NSW SCS method of rangeland assessment in the Western Division

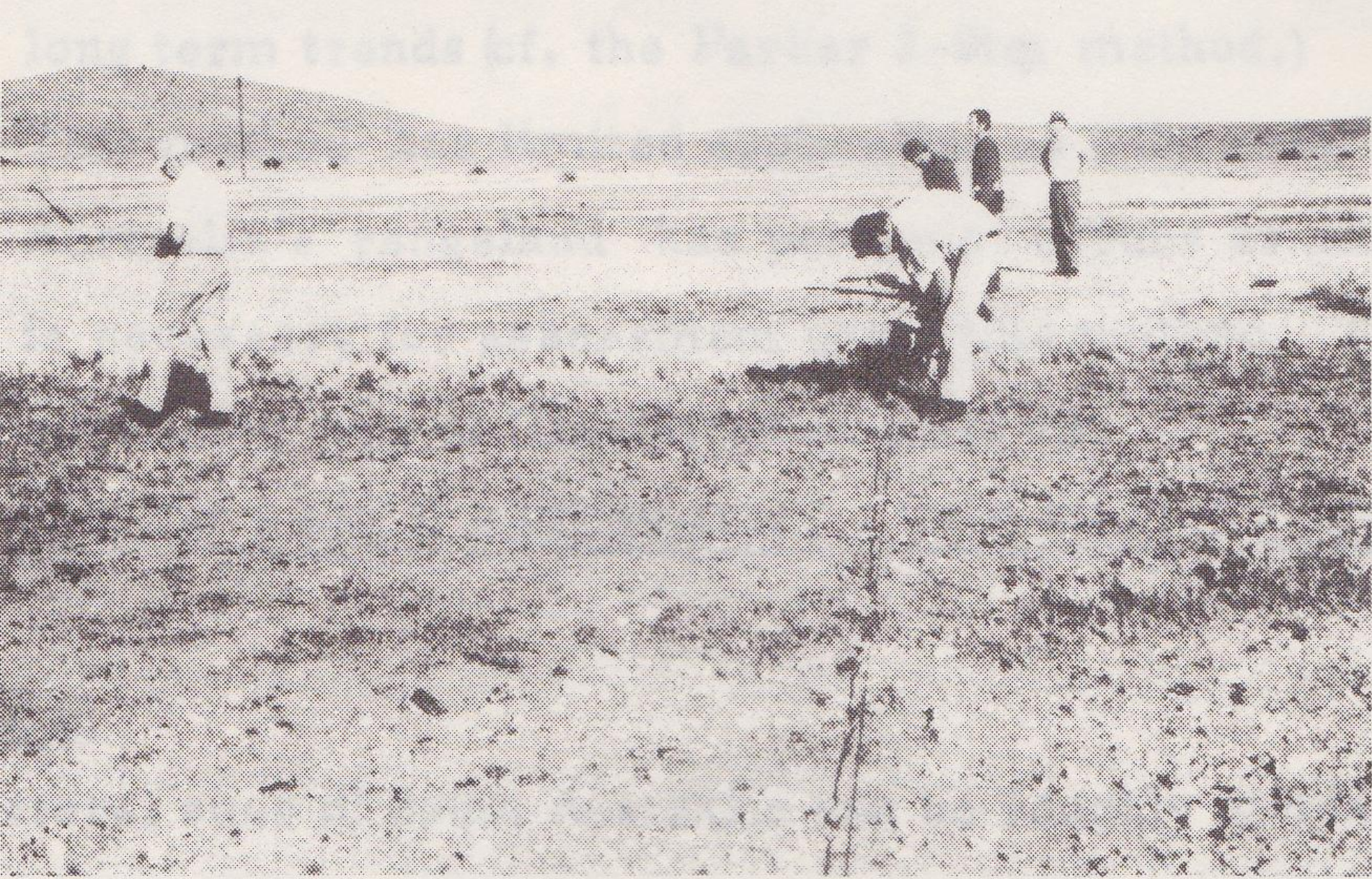


Plate 11: Saltbush site. Condition class: poor. May 1973. Parker 3-step method being tested across gilgai depression.



ate 2: Mitchell grass site, Fowlers Gap. Condition class: good.
ptember 1973. Note abundance of ephemeral herbage between
ass tussocks.

Our conclusions at the time

- “There was no general agreement at either workshop as to which method was “best” for assessing the sites at Fowlers Gap.
- The Deming and SCS methods appeared to be most favoured, though it was noted that the Deming method was not now used in the US where it was developed
- Lay and Evans noted that the Central Australian method being developed by Barney Foran and Colin Lendon may have more application in SA
- Jessup method useful for chenopod shrubland sites only

Lake Phillipson near Coober Pedy after record rainfalls in 1974



Western Myall and kerosene grass 1974



The Pastoral Board - How it all started

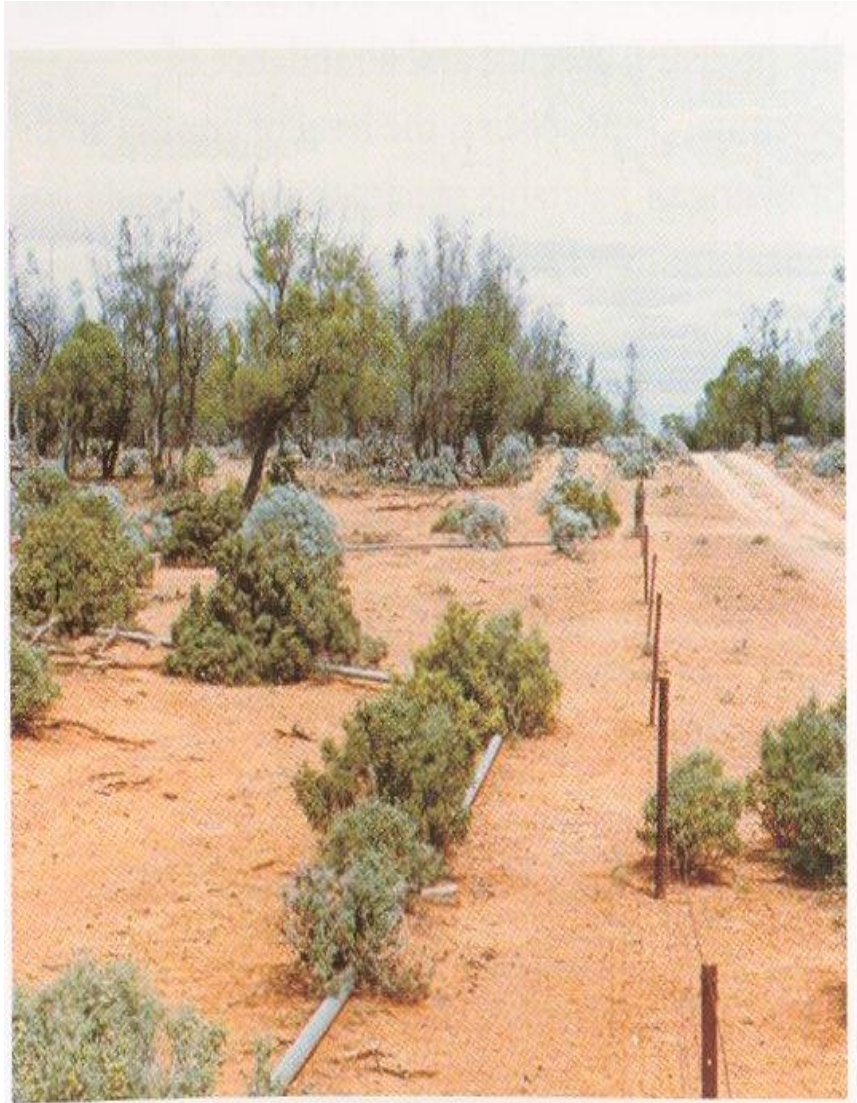
- 1894 – Pastoral Act & 3-man Board established to manage pastoral leases
- 1936 New Pastoral Act, 3-member Board with dedicated inspectors
- 1943 Inspector Cecil Goode began documented photo-record
- 1948 Soil Conservation Officer Fred Jessup's first shrub density study
- 1960 Current pastoral leases granted
- 1969 First Ecologist funded by Board (Brendan Lay) – second shrub density study
- 1976 – 1979 First assessment officers attached to Board – 3 staff
- 1985-7 Assessment Branch of Dept of Lands established – 8 staff
- 1989 New Pastoral Act – requiring assessment of all leases and Pastoral Board increased to six members
- 1991– First round of assessments begins in Kingoonya – 14 staff
- 1994 Third shrub density study in Kingoonya district (John Maconochie)
- 2000 First round of pastoral assessments completed
- 2005 Second round of pastoral assessments began in Kingoonya - 5 staff
- 2007 Kingoonya District second round completed,
- 2008 Brendan Lay retires

Historical Photo-relocation Project

A Postive Trend - E. of Burra SA



1962



1998

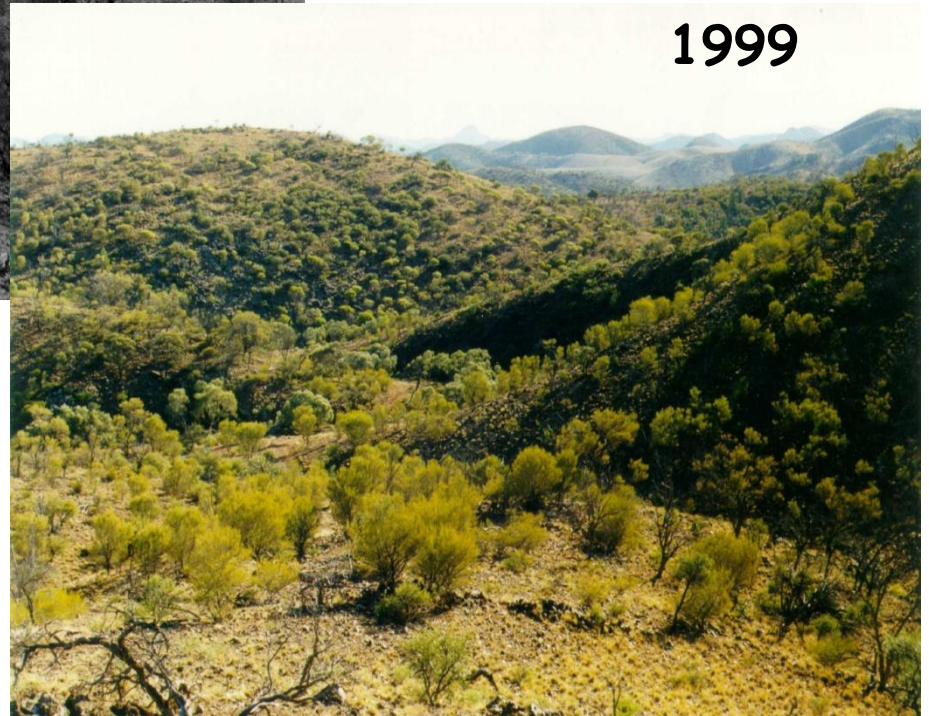
Changes in Gammon Range Nat. Park

1966



**Increase in
Mulga and
silver wattle**

1999



Historical Photo-relocation project

Oulnina Stn Barrier Hwy

North East SA



Photo
1942

Photo 1996
Changes observed in
early 1970's, in run
of exceptional
seasons



1927



Pastoral Board archives

Historic (Opportunistic)
photopoint at North Well
homestead near Woomera

2005



Photopoint 14 , Bon Bon Station



1973 —showing bare ground and grazeline on *Acacia tarculensis* shrub

2003 — same area 30 years later showing regeneration of palatable *Maireana* and *Atriplex* shrubs and no grazeline on the *Acacia tarculensis*.



**Photopoint 22 Bon Bon –
fire effect on *A. ramulosa***

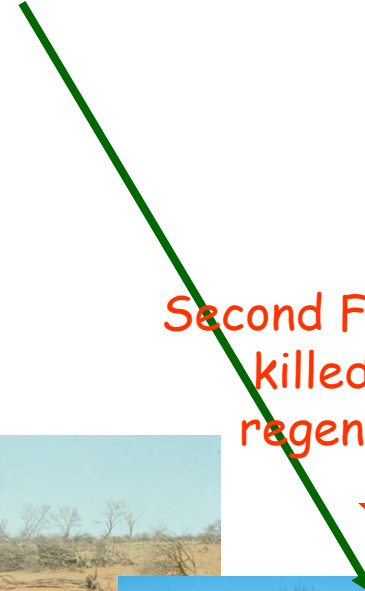
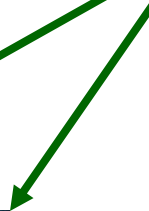


Photopoint 22 - Bon Bon -

fire effects on sandy mulga country



Death of mulga -
retention of timber



Second Fire 1994 -
killed mulga
regeneration



Transition: mulga woodland to
grassland

Where seasons come and go-

The Channel country -effect of record monsoonal rains in the 1970's



1962 - no flows down the river channel for more than 20 years

2002 — effect of several major summer flows have transformed the landscape — Coolabah trees have regenerated in the channel



Ahhh – exciting departmental talkfests!



The best project in my career - Lake Gairdner Island Monitoring –

Northern archipelago courtesy of “Robin Young airlines”



Vehicles used on the Lake Gairdner survey



Island 26 – 1997 survey



Pastoral assessments -Photopoint monitoring

- Accurate location details vital to ensure re-photos of exact scene (now use GPS units to cross-reference)
- First series (1-1000) collected no data with photos - general notes on 5x8" cards only
- Now have as a minimum plant species lists with cover-abundance and life-stage attributes
- Density (Jessup) and cover measurements (steppoint) at many sites, now entered directly on field data tablets
- Markers originally mulga posts but now use mostly galv. reo-rod with polypipe covers, with GPS co-ords automatically recorded.

Disc as used on all photopoints – good target practice!



Craig Boulderstone and Bren Lay during first round of pastoral assessments in 1992

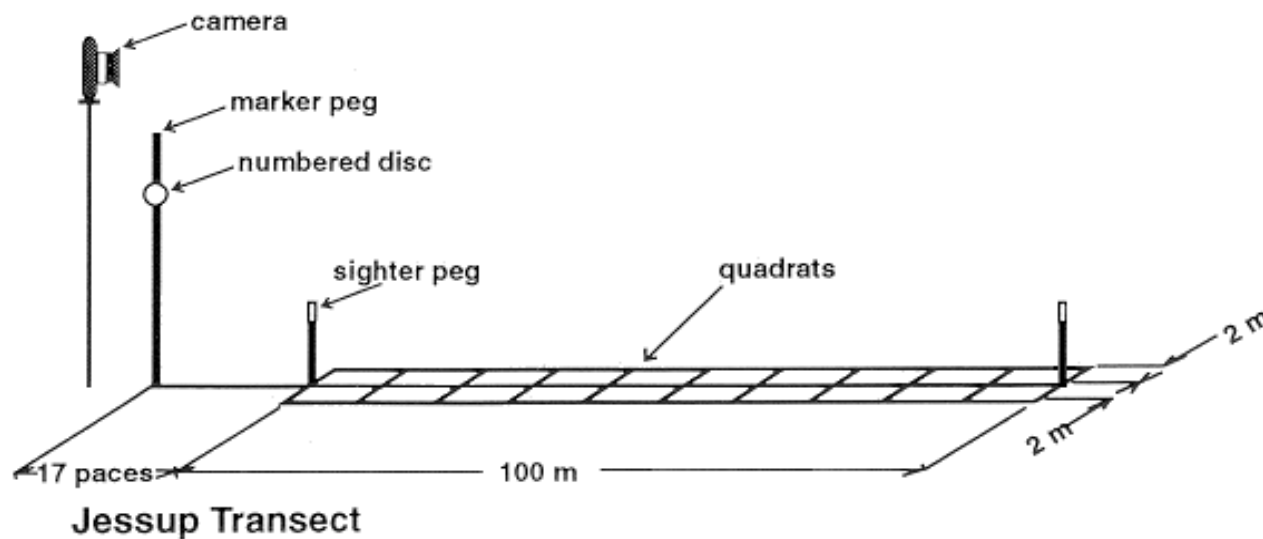


Mulga post typical of my early photopoints
1-350 (1970-74) (Most are still sound after 40+ years).

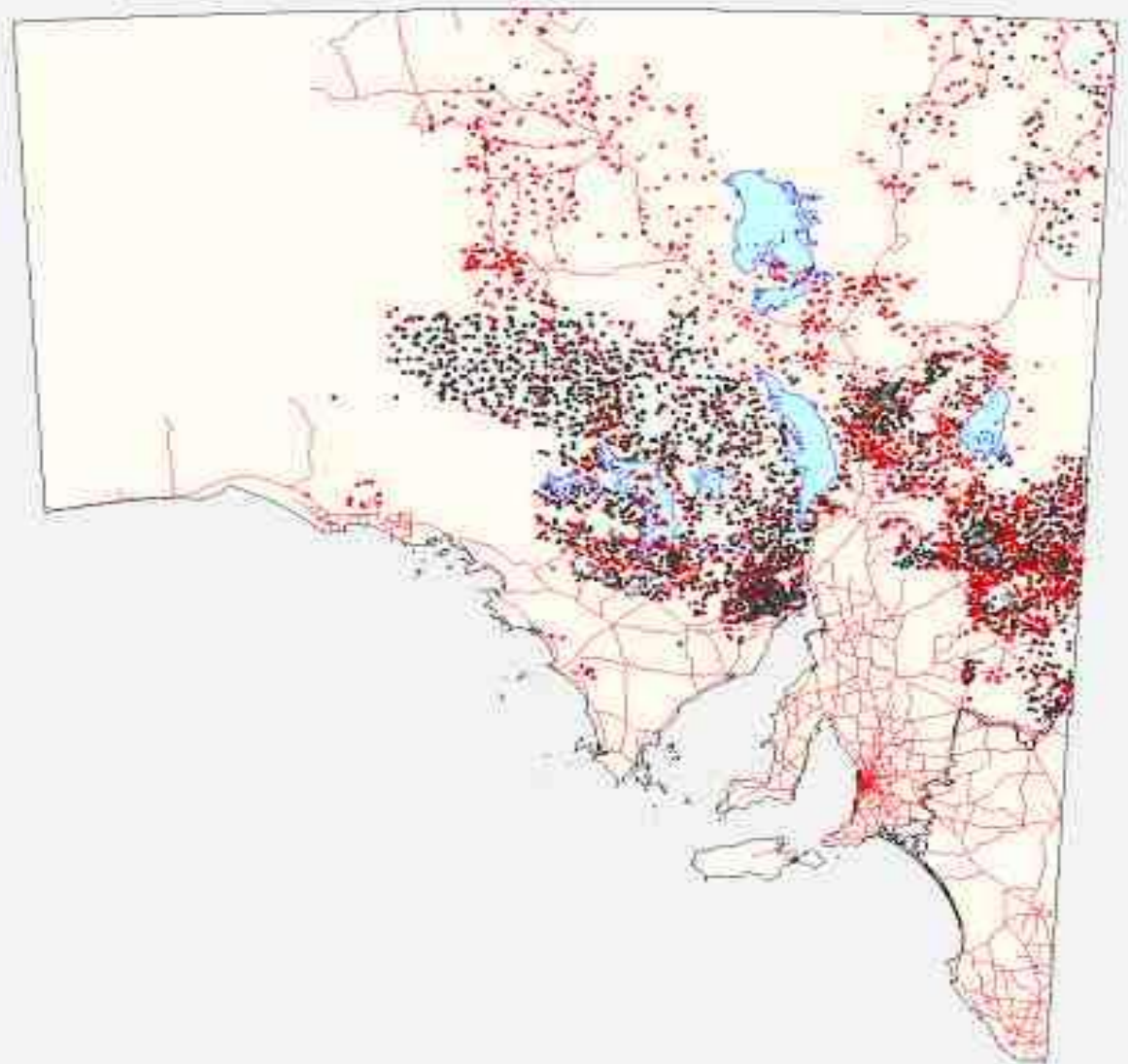


Photopoint marker and layout as used today

A 25mm polypipe is inserted over reo-rod for extra visibility



**Coverage of
photopoint
sites using
Bren Lay's
numbering
series (more
than 10 000 as
of 2008)**



- Quantitative site
- Observation site
- Threatened species
- Total grazing
- Reference site
- Wood site



Disclaimer: This map does not constitute an official statement of the South Australian Government and is not intended to be used for legal purposes. It is provided for information only and should not be used to make decisions about land use or management.

Map Data: The map data is derived from a combination of aerial photography, ground-based observations, and other sources. It is not intended to be used for legal purposes.

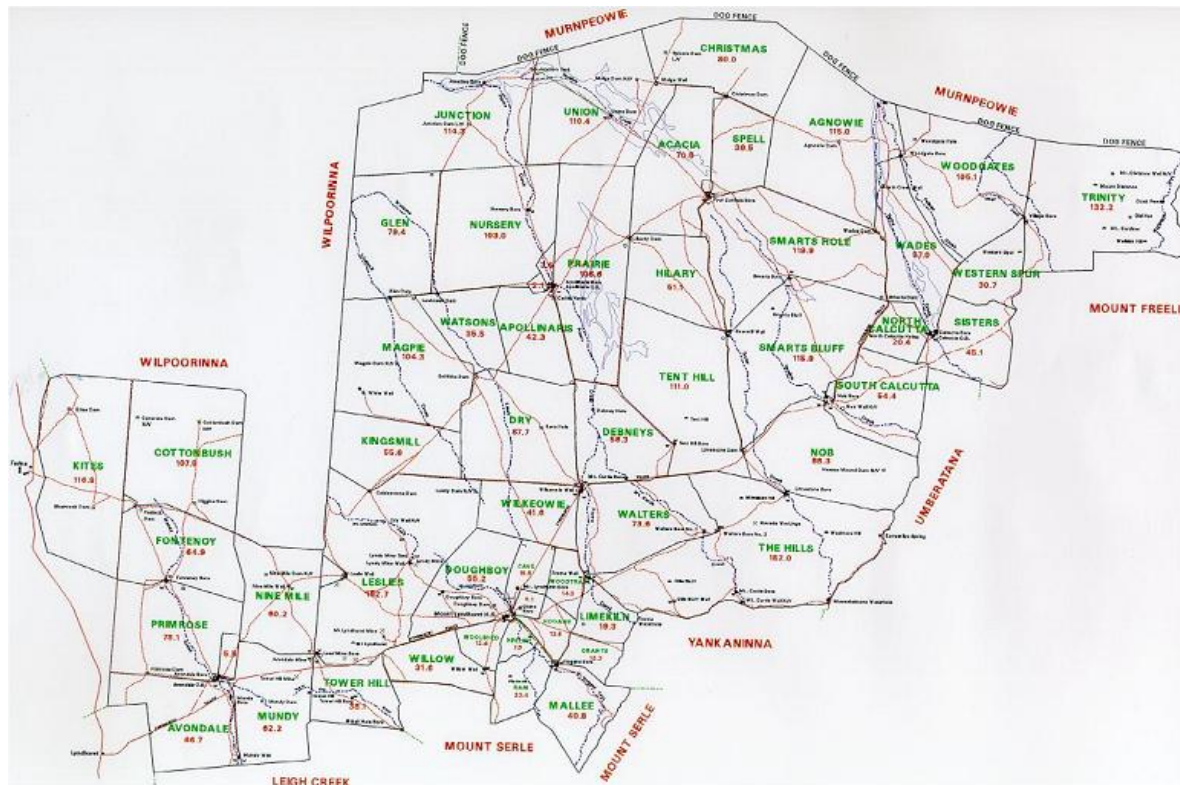
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Map Accuracy: The map accuracy is not guaranteed. It is provided for information only and should not be used to make decisions about land use or management.

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GIS: Landscapes and infrastructure

- Identify, describe and map vegetation and soil types - Land Systems
- **Identify and map infrastructure and its influence on condition- GPS**



**Standard
Paddock Plan
(Arc/Info -
ArcMap)**

Calibrating new assessment staff in the Jessup belt transect technique – July 2012



Screen grab of Pastoral Unit's FDE (field tablets) – Photopoint data sets

The screenshot displays the 'Arkaroola Pastoral Data' software interface. The main window has a title bar and four tabs: 'Map', 'GPS', 'Data Maintenance', and 'LCI Import'. The 'Map' tab is active, showing a map of the Arkaroola region with various landmarks labeled: 'Humanity Seat', 'Coulthard Lookout', 'Arkaroola W/H', 'Mount Oliphant', 'Arkaroola Bore', and 'Mount Elva'. A dashed line indicates a track, and a point labeled '7525' is marked on it. A 'Photo Point: 7525' dialog box is open in the foreground, featuring several tabs: 'Location', 'Observers', 'Landscape', 'Photos', 'Animals', 'Plants', 'Jessup', 'Monitoring', 'Dominance', and 'Comments'. The 'Location' tab is selected, showing fields for 'Site Number*' (7525), 'Site Type' (a dropdown menu), and 'Source Type' (a dropdown menu). Below these is a 'Mudmap Text*' field containing the following text: 'Site located 4.52 km north of Boulder Bore on track to Stubbs Waterhole. Zero at Bore. Jarrah peg and disc located 110 paces south west of track. No sighter pegs. Photo (A) taken on bearing 198°. Photo (B) taken on bearing 301°. Photo (C) taken on bearing 336°.' To the right of the form are buttons for 'Save' (with a green checkmark), 'Cancel' (with a red X), and 'Move' (with a double-headed arrow). At the bottom of the dialog are 'Previous' and 'Next' buttons. A legend on the right side of the main window lists various features with checkboxes, all of which are checked: South Australia, Photo Points, Water Points, Misc Points, LCI Results, Point Infrastructure, Water Pipelines, Waterbodies, Pastoral Roads, Major Roads, and Linear Infrastructure. The bottom of the main window has a toolbar with icons for zooming, panning, and other map functions.

Arkaroola Pastoral Data

Map GPS Data Maintenance LCI Import

Humanity Seat

7525

Coulthard Lookout

Echo Camp waterhole

Arkaroola W/H

Mount Oliphant

Arkaroola Bore

Mount Elva

Photo Point: 7525

Location Observers Landscape Photos Animals Plants Jessup Monitoring Dominance Comments

Site Number* 7525

Site Type

Source Type

Mudmap Text*

Site located 4.52 km north of Boulder Bore on track to Stubbs Waterhole. Zero at Bore. Jarrah peg and disc located 110 paces south west of track. No sighter pegs. Photo (A) taken on bearing 198°. Photo (B) taken on bearing 301°. Photo (C) taken on bearing 336°.

Save Cancel Move

Previous Next

Legend

- ☒ South Australia
- ☒ Photo Points
- ☒ Water Points
- ☒ Misc Points
- ☒ LCI Results
- ☒ Point Infrastructure
- ☒ Water Pipelines
- ☒ Waterbodies
- ☒ Pastoral Roads
- ☒ Major Roads
- ☒ Linear Infrastructure

Screen grab of display on the Pastoral Unit's new FDE – Photopoint 7535

The screenshot displays the 'Arkaroola Pastoral Data' software interface. The main window features a map of the Arkaroola region with various landmarks labeled, including 'Humanity Seat', 'Coulthard Lookout', 'Echo Camp waterhole', 'Arkaroola W/H', 'Arkaroola Bore', 'Mount Oliphant', and 'Mount Elva'. A 'Photo Point: 7525' window is open, showing tabs for 'Location', 'Observers', 'Landscape', 'Photos', 'Animals', 'Plants', 'Jessup', 'Monitoring', 'Dominance', and 'Comments'. The 'Plants' tab is selected, displaying a 'Plant Species List' for site number 7525. The list includes columns for Species, Common Name, Date, and Sighted. The 'Add Plant' button is visible at the bottom of the list.

Feature Legend

- ☒ South Australia
- ☒ Photo Points
- ☒ Water Points
- ☒ Misc Points
- ☒ LCI Results
- ☒ Point Infrastructure
- ☒ Water Pipelines
- ☒ Waterbodies
- ☒ Pastoral Roads
- ☒ Major Roads
- ☒ Linear Infrastructure

Photo Point: 7525

Location Observers Landscape Photos Animals **Plants** Jessup Monitoring Dominance Comments Save Cancel

Plant Species List

Plant species for site number: 7525

Species	Common Name	Date	Sighted
Abutilon otocarpum	Desert Lantern-bush	22/05/2000	<input type="checkbox"/>
Acacia aneura var.		22/05/2000	<input type="checkbox"/>
Acacia tetragonophylla	Dead Finish	22/05/2000	<input type="checkbox"/>
Alectryon oleifolius ssp. canescens	Bullock Bush	22/05/2000	<input type="checkbox"/>
Casuarina pauper	Black Oak	22/05/2000	<input type="checkbox"/>
Cheilanthes lasiophylla	Woolly Cloak-fern	22/05/2000	<input type="checkbox"/>
Erneapogon avenaceus	Common Bottle-washers	22/05/2000	<input type="checkbox"/>
Eremophila freelingii	Rock Emubush	22/05/2000	<input type="checkbox"/>
Exocarpos aphyllus	Leafless Cherry	22/05/2000	<input type="checkbox"/>
Hakea ednieana	Flinders Ranges Corkwood	22/05/2000	<input type="checkbox"/>
Ptilotus incanus/obovatus	Silver Mulla Mulla	22/05/2000	<input type="checkbox"/>
Santalum lanceolatum	Plumbush	22/05/2000	<input type="checkbox"/>
Senna artemisioides ssp. oligophylla	Limestone Senna	22/05/2000	<input type="checkbox"/>
Senna artemisioides ssp. X artemisioides	Silver Senna	22/05/2000	<input type="checkbox"/>

Add Plant Plant Details

Whywhyana creek Arkaroola 1989



Whywhyana creek, Arkaroola 2008



What changes have occurred in the rangelands during the last 40 years?

- **General improvement in vegetation condition throughout, no matter which method used to determine this!**
- **Corresponding decrease in active erosion – particularly wind and scalding, - gully erosion continues where well advanced**
- **“Bounceback” by perennials during the 15 year period the rabbit calicivirus has been effective**
- **Worrying instances of spread of invasive weeds, particularly in last decade – e.g *Peganum harmala*, *Cylindropuntia prolifera* and *Acacia farnesiana***
- **Purchase of increasing numbers of leases for conservation purposes**
- **Purchase of increasing no. of leases for indigenous groups**

The joys of camping - Winter 1996 on Weekeroo station;
Eddie Piedrahita and Chris Turner



Life after retirement



Building Copper Top walking track (near Oodnadatta) with Friends of Mound Springs 2011



Dalhousie Springs 2011 – Patron of “Friends Group of the Simpson Desert Parks”



Some elements of work in the Outback never change
- testing floodwaters over Leigh Creek to
Balcanoona road, May 2010



**Wirilda revegetation project (Adelaide Hills) – Photopoint
6, June 1975**



Wirilda Photopoint 6, Aug 2005

