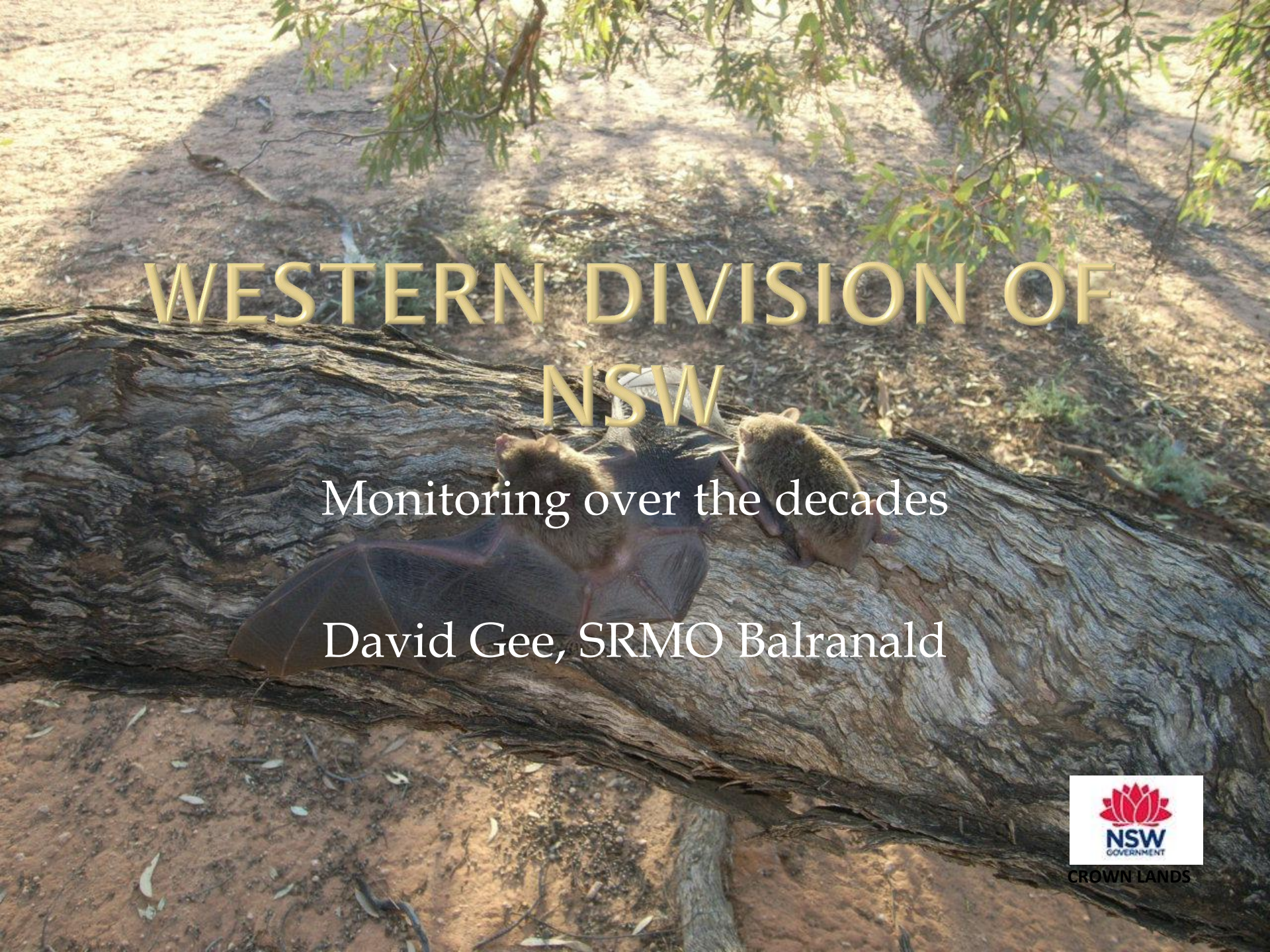


WESTERN DIVISION OF NSW

Monitoring over the decades

David Gee, SRMO Balranald

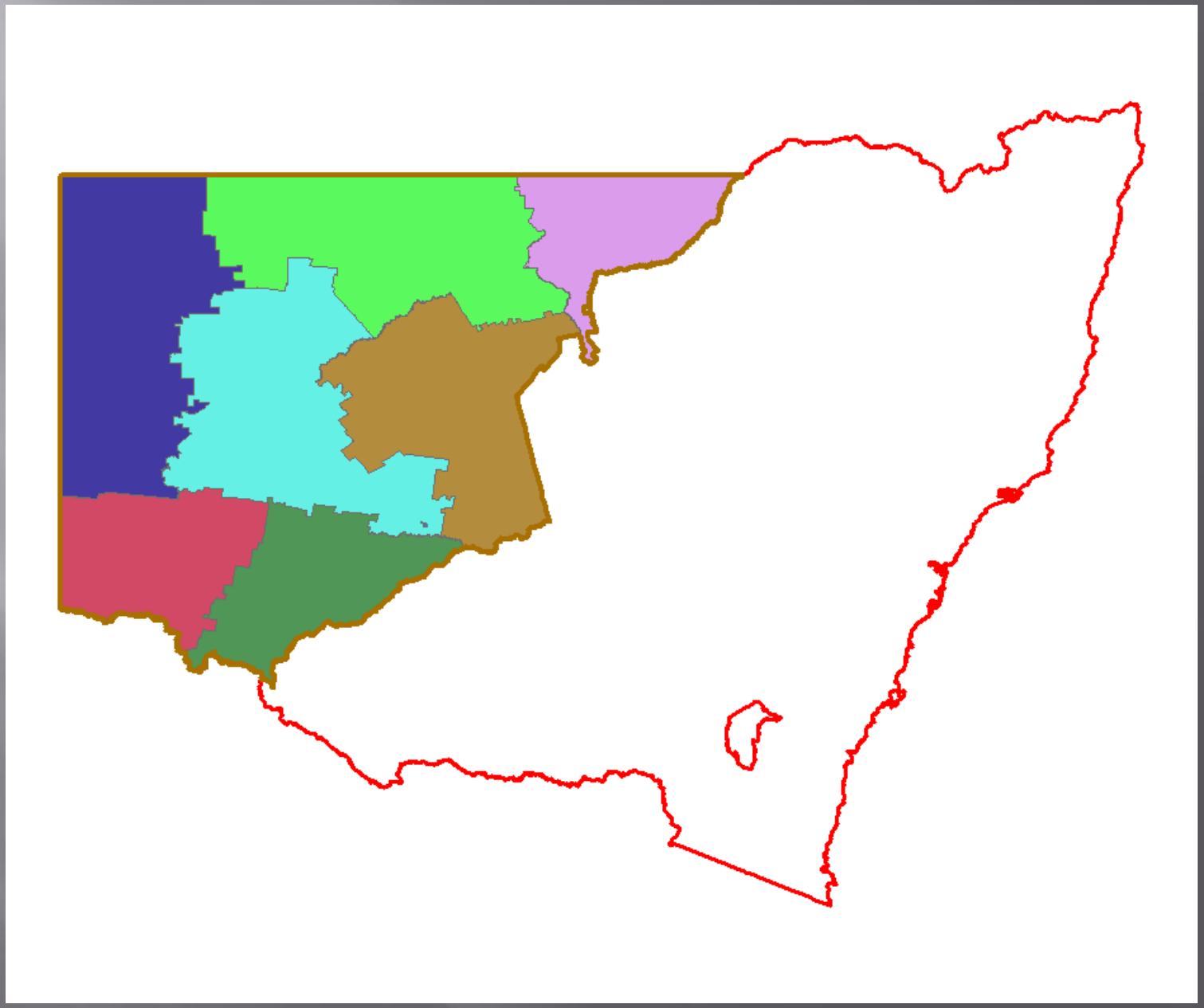
NSW GOVERNMENT
CROWN LANDS

The Western Division of NSW

The Western Division of NSW includes approximately 32 million hectares of rangelands with a rainfall ranging from 500mm in the north-east corner through to 150mm in the north-west corner.

This area has been divided historically into pastoral districts, (now called Rangelands Management Officer Districts) of which there are seven.

Rangeland Officer Districts



The year 1901, the Western Lands Act.

The establishment of the Western Territorial Division, (later to become the Western Division of NSW), was derived from the Crown Lands Act of 1884. The Western Lands Act was formulated from a Royal Commission that inquired into the Condition of the Crown Tenants in the Western Division which had suffered environmental damage prior to 1900 from over grazing, rabbits and drought.

The beginning of Conservation in the Western Division

One of the main thrusts of the WL Act was Conservation – the Act made no further provisions for the alienation of Crown Lands and subjected the leased land to conditions to protect the environment. With the formation of the WL Act in 1901 came the necessity for monitoring of the pastoral lands.

- We now shift our attention from the beginning of the nineteenth century to 1989.

ap in time

Monitoring Western Lands Leases

Understanding range condition in our Western Lands Leases within the Western Division is a huge task and one that is probably beyond our current resources.

I have been involved with the Western Lands of NSW since 1989, so I will speak about the development of the monitoring programmes and tools that have been developed since 1989 to now and into the future.

1989 – Onwards

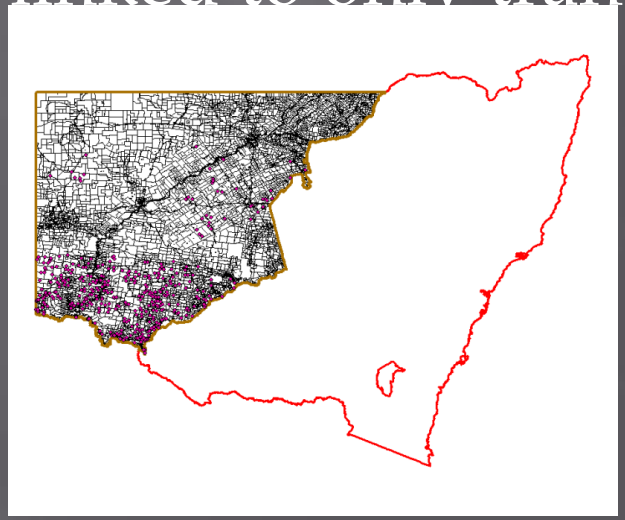
- In 1990 a new system began. A policy was developed within the Western Lands Commission to visit every property within each of the Rangelands Management Inspector's, (as they were known then) districts over a five year period. This was to be a reoccurring inspection so this system was called the cyclic inspections. A new form, (11 pages) was developed to ensure consistent gathering of data. Data gathered ranged from updating the lessees particulars to stock numbers, estimates of total grazing pressures, vegetation species present and condition of the improvements.
- This system persisted for approximately three years but failed due to administrative changes, (creation of new Departments) and a reduction in resources. It became apparent that there was not enough time to visit each property every five years.

1995

- The old cyclic inspection form becomes the (Conservation and Land Management), C.a.L.M. Property inspection form.
- The form is revamped and information about total grazing pressure was removed
- Detailed information about the vegetation is removed and put into another programme
- Form consolidated and reduced to seven pages

1996

- I became concerned about the subjective nature of the information gathered, comments such as the vegetation is in ‘good heart’ were still being bantered about
- Development of the photo point system
- Photo points were not linked to only transfer inspections



Photopoints

Originally designed so that leaseholders could submit the photograph and data annually to obtain a rental rebate

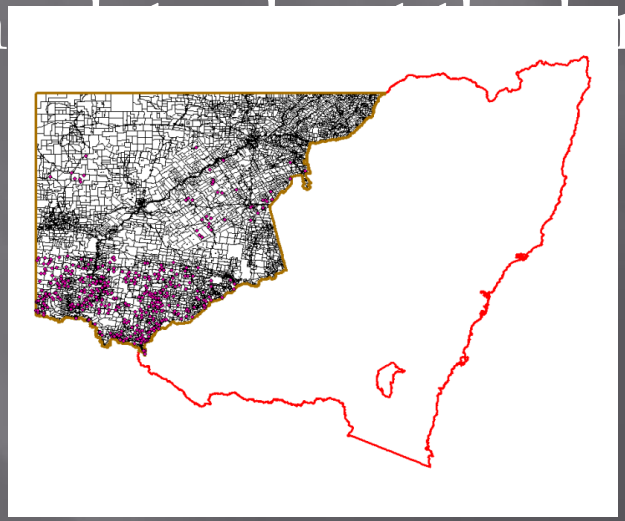
Information recorded – GPS location

- \- Landsystem
- \- Vegetation present
- \- Cover class

2004 2012

Yet another change, circa 2001

- OR.... you just can't leave a good form alone!
- It became apparent that even though there were now photo points being established not everyone were putting them in.
- A revamp of the form again occurred this time to include som[illegible]nd condition



That @#!! Form again

Part 5 – Land Condition Assessment

Landsystem Sheets :				
Dominant Land System/s		%	**Pasture Condition Rating**	**General Comments (trees, shrubs, fire, cryptogams, regeneration etc.)**
1	Bulgamurra	65%	3	Excellent annuals with recruitment of some perennials. Woody weeds are becoming a problem
2	Wilkurra	30%	3	As above
3	Morona, Mulga Downs & Overnewton	5%	3	As above
4		%		
5		%		

1 Excellent Pasture Condition. Nearly all plants are desirable species and ground cover is optimum for the site.	**Notes (1 & 2):** When perennial plant species present include all or most of the species expected. Some species may have increased, but the total species composition and number are close to optimal. Soil, water and nutrients are strongly conserved and used within the system. Erosion is non-existent or minor.
2 Good Pasture Condition. Most plants present are desirable with intermediate perennials and annual types increasing in frequency; a few undesirable species may be present.	
3 Fair Pasture Condition. Intermediate value species usually predominant; desirable and undesirable species occupy similar proportions of the available ground space. Small patches of bare ground may be present with/or small areas of woody weeds.	**Notes (3):** Moderate losses of certain perennials and/or increases in other shrubs and grasses have occurred but most original species are still present. Some soil, water and nutrients may have been lost, but most are retained and erosion (if present) is minor. With good seasons and careful management sites can be returned to good condition.
4 Poor Pasture Condition. Undesirable and intermediate species predominate in the stand; desirable species are very infrequent and may only occur in small patches. Overall stand may be sparse or patchy with frequent small areas of bare ground and patches of thick woody weed increasing.	**Notes (4 & 5):** Vegetation is characterised by marked decreases in the number of plants and occasional losses of plant species. This may result in either areas of bare ground or areas dominated by increased species such as woody shrubs. Because of the loss of individuals and even whole species in rare cases, the soil is more open to water and wind erosion. It tends to lose soil, water and organic matter and is unable to capture replacement materials. Alternate management is required to halt cycle. (Adapted from Payne, Burnside, etal.)
5 Very Poor Pasture Condition. Undesirable species bare ground and/or thick woody weed predominate; few intermediate species and virtually no desirable species in the stand	

Photo Reference Points:

Comments and Any Required Management Actions:
Property in Good condition with good vegetation cover over all areas.

2011

- On 1st July 2011 a new programme has been developed, the Western Division Range Condition Assessment programme.
- The programme aims to track the changing condition of the rangelands.
- The 2011/2012 programme had a target of 140 property inspections, at the end of June 2012 127 property inspections had been taken place, the total was under the target mainly due to heavy rainfall

What's different

- A coordinated programme did not exist
- Until now, (111 years after the beginning of the Western Lands Act), most of the measures used to assess the condition of the Western Lands lease has been primarily subjective. The new programme seeks to eliminate subjectivity from the assessment and provide a comparative analysis of landholdings having regard to land and vegetation types and climatic conditions
- A program that seeks to engage with landholders and which is based on the fact that biomass is the only standard measure that can be utilised to calculate vegetative matter. There are several methods that can be utilised to collect biomass data but the use of biomass photo standards is a simple, objective and robust measure that has been used in SA, QLD and WA and by state agencies such as DPI.

Why do we do this?

The Western Lands Act in Section 18D(e) states

(e) A lessee shall not overstock or permit or allow to be overstocked the said land, and the decision of the Commissioner as to what constitutes overstocking shall be final;

Challenges

When designing a programme of primary production measurement there are many challenges.

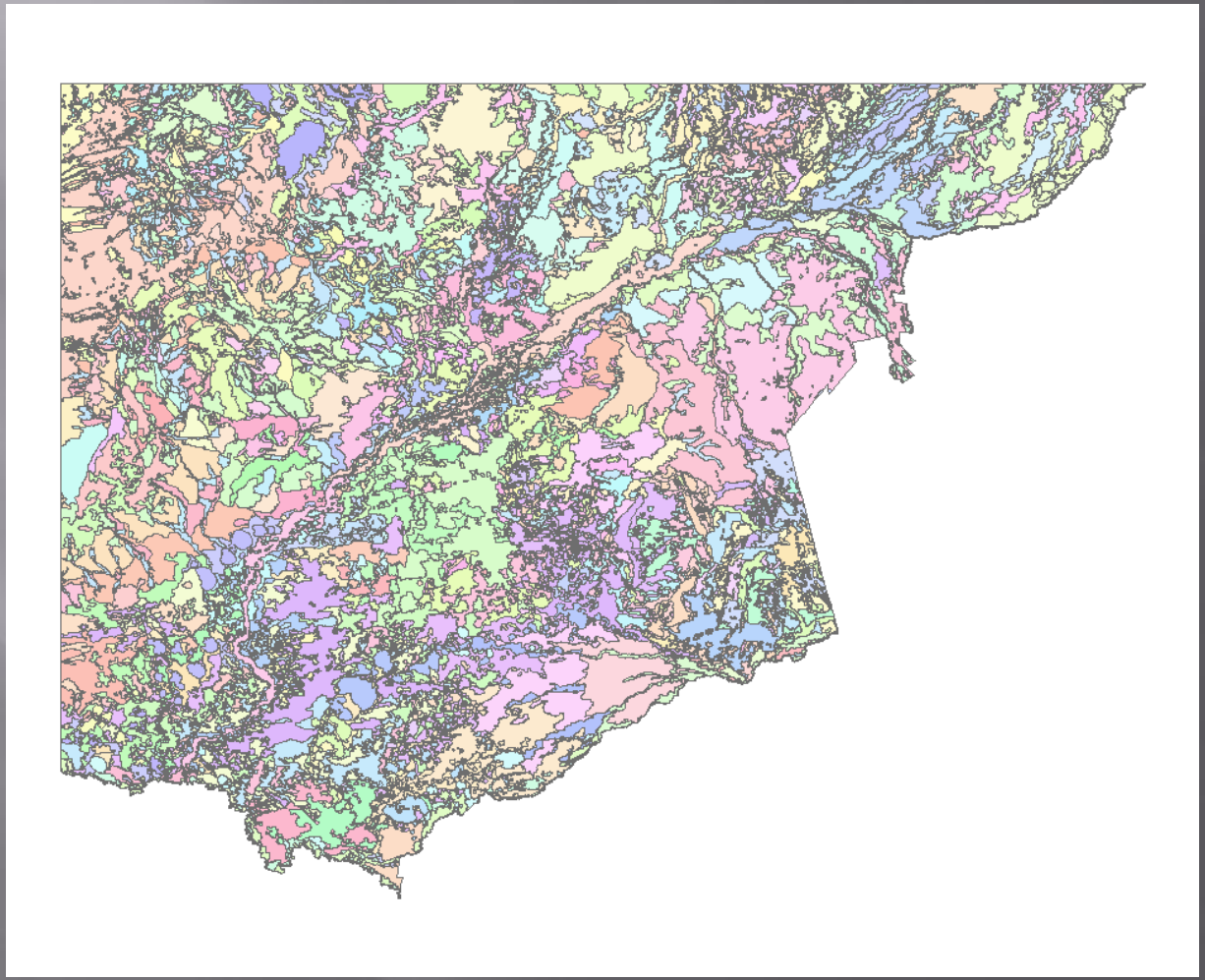
- The Western Division is a complex landscape
- Time available in the field
- Equipment and resources required
- Producing a useful meaningful measure that is robust and easy to use

WESTERN DIVISION BIOMASS MEASUREMENT

We need to sub group the Western Division into a practical size, we do already have some rough filters at our disposal

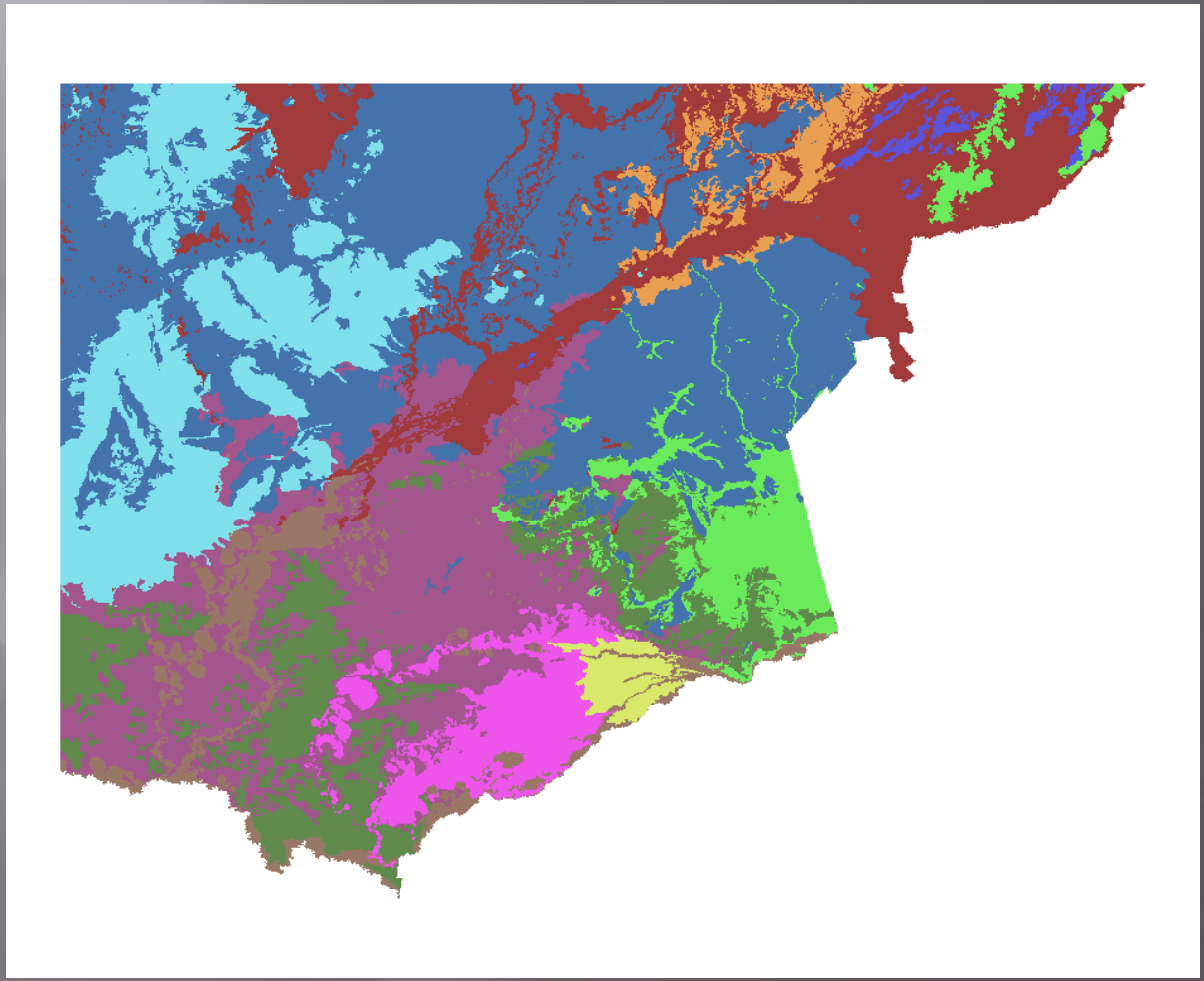
1. RMO District, (7 in WD)
2. Rangetype, (20 in WD)
3. Landsystem, (251 in WD)
4. Land Class, (many within each landsystem)

WESTERN DIVISION BIOMASS MEASUREMENT



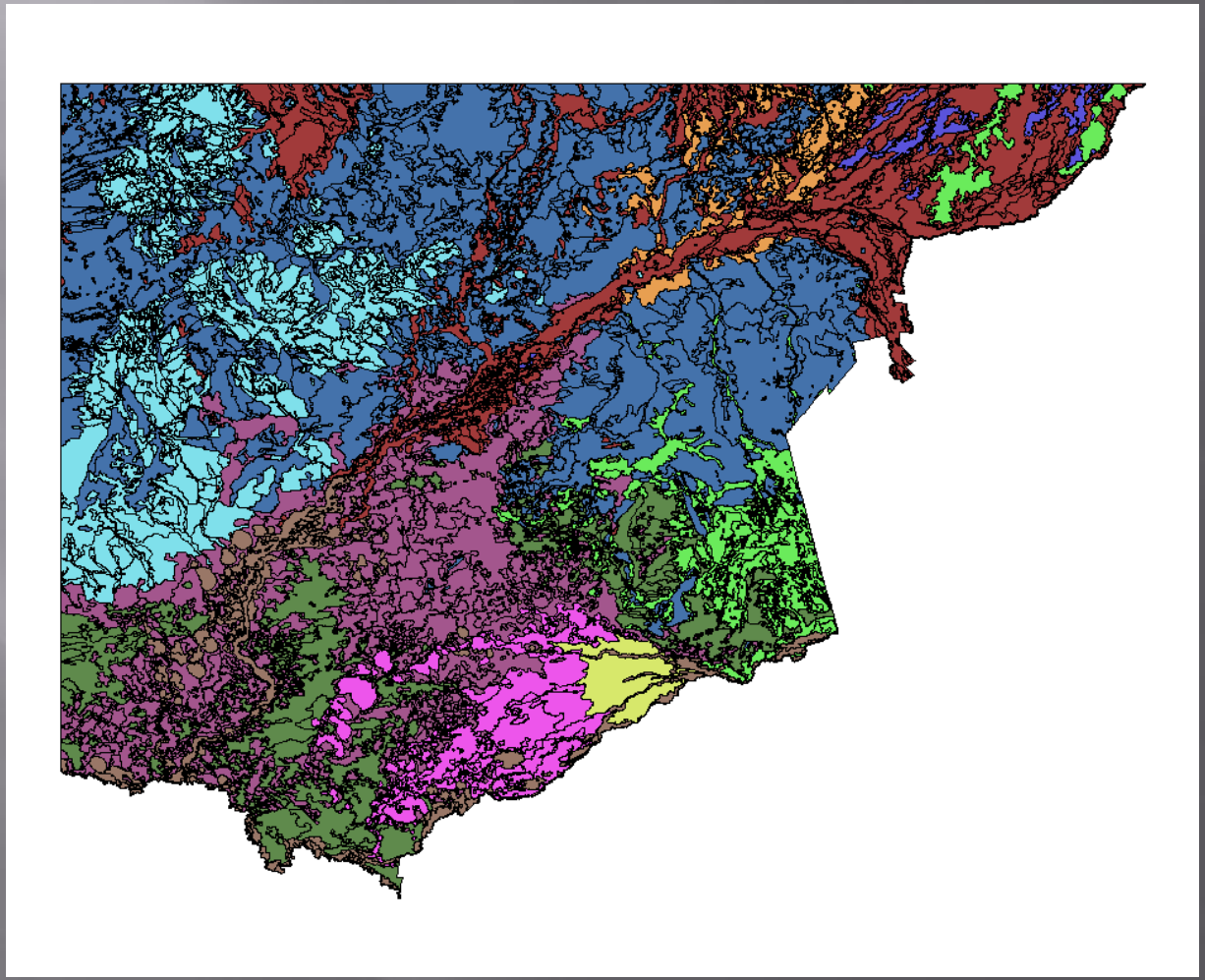
Landsystems within the Western Division

WESTERN DIVISION BIOMASS MEASUREMENT



Rangetypes within the Western Division

WESTERN DIVISION BIOMASS MEASUREMENT



Landsystems overlaid over the major rangetypes

WESTERN DIVISION BIOMASS MEASUREMENT

The initial work of assessment and calculation of the biomass within the district and rangetypes will be conducted by one person and a series of photo standards developed that can be used for biomass determination by RMOs.

WESTERN DIVISION BIOMASS MEASUREMENT

For each RMO district there will be a set of photo standards. Each set of photo standards will depict a photograph of a quadrat taken vertically over the quadrat, with the selected fodder plant (as determined by the RMO), for that rangetype and a calculation for the biomass of the plant at that particular density as well as a photograph giving a landscape view.

Pilot programme procedure

An area is selected that reflects a level of biomass, for example, optimum or minimum amount of RMO identified significant fodder plant for that range type.

A quadrat is then placed over the area.

Spear grass in optimum amount, (10,636kg/ha) in the Sandplains & Dunefields with belah and rosewood **rangetype**

Once a site is selected a photograph is taken directly over the top of the quadrat showing the coverage of the vegetation.

This photograph will be used as part of the photo standards RMO's will use in the field along with the landscape photograph

Spear grass at 10,636 kg/ha

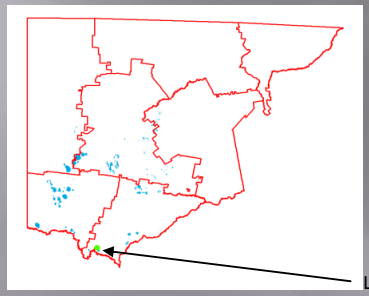
The area is then clipped of all vegetation. With the species of interest bagged separately to the rest of the vegetation within the quadrat. The samples are weighed in the field with bag weight and wet sample weight recorded. The wet weight is used to calculate the percentage of moisture in the vegetation.
The samples are then dried in an oven for 48 hours at 70^{o}C and then weighed again to get the dry weight, it is from that weight that the biomass is calculated per ha.

Pilot programme procedure

All vegetation within the quadrat is clipped to ground level to calculate the total biomass for the area.

BIOMASS DATASHEET

RANGETYPE – LAKEBEDS AND SWAMPS
RMO DISTRICT – Balranald
Date sample obtained – 14.09.2011



Location of sample site and range type distribution

Landscape view **Lakebeds and Swamps** @ 11,874 kg per ha.

PHOTO STANDARDS FOR Lakebeds and Swamps
– RMO DISTRICT - BALRANALD

STATUS – Sustainable
Key Species – Black bluebush, *Maireana pyramidata*

Key Species – Black Bluebush	
Percentage of dry matter =59%	
Dried sample weight = 1187.4 g	
Biomass = 11874 kg per ha	
	Total Biomass
	Percentage of dry matter =59%
	Dried sample weight =11874 g
	Biomass =11,874 kg per ha

NOTES:

Area heavily grazed by rabbits, kg per ha divided by 25 due to poor grazing value of bluebush

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