

# WANSBROUGH SITE

## Saltland Perennial Pasture Companions Project

Gen Harvey, Project Officer, Gillamii Centre



CARING  
FOR  
OUR  
COUNTRY

### 1. KEY MESSAGES:

- Demonstrate that sites showing signs of salinity can be treated with existing proven technologies which the community can adopt and extend.
- Demonstrate that Saltland Genie and SALTCAP2 are valuable tools to assess and establish saltland pastures.
- Demonstrate that investing in areas of low productivity, improvements can be made economically to productivity and environmental sustainability.

### 2. AIM:

The aim is to trial and demonstrate the use of the FFI CRC's SALTCAP2 saltland site characterisation protocol on a local site where saltland variability is high and the recommended targeted plants can be easily observed (highly visual site and major road) by the community.

### 3. BACKGROUND:

This property is a highly visible, badly salt affected area which adjoins the Great Southern Highway. As it is visible to road users, it was suggested to the Landholder, Mr Tom Irving, that it would suit the purposes for a trial site demonstrating the methods outlined by the Saltland Genie and SALTCAP2.

Mr Irving agreed to the proposal allowing the worse affected areas to be fenced to enable him to retain as much grazing land as possible.

The area included in the demonstration site has significant degradation to the soils. The site is predominantly covered with barley grass with some areas of bare scald.

<b>Property Details:</b>	Tom Irving
<b>Location:</b>	Great Southern Highway
<b>Rainfall:</b>	400mm - 600mm
<b>Soil Type:</b>	
<b>Main Enterprise:</b>	Sheep Production

#### 4. METHOD:

- a) Characterise the site using the SALTCAP2 criteria. (see table below)
- b) Ask Saltland Genie for recommendations based on the SALTCAP2 criteria.
- c) Implement Saltland Genie recommendations.
- d) Collect optimal number of pre and post treatment site characterisation, plant composition and animal productivity information (for a minimum of 5 years) with date being stored on the FarmBase web-based database.
- e) The Gillamii Centre staff will provide feedback to the FFI CRC researchers on the results and effectiveness of the two key products – SALTCAP2 and Saltland Genie which will help them improve the reliability of the recommendations by examining relationships between vegetation and measured soil characteristics at this variable saltland site. This data collected will also be looked at in the context of 6 other existing previous SGSL sites and 2 new saltland sites where monitoring has been taking place for some time. (area includes North Stirlings Pallinup as well as Gillamii). Local DAFWA staff are currently assisting by transferring the technical skills in making these measurements and using the database, to the Gillamii staff.

Measurements will take place adjacent to targeted shallow piezometers. The data that we would like to collect, the frequency of measurement and its level of importance are tabled below.

No.	Measurement	Frequency	Importance
1	Site location (GPS reading)	once	high
2	Date of every observation	as required	high
3	Native and naturalised species, and bare ground, occurring at site as % cover	late spring	high
4	ECe (0–25, 25–50 cm) near species described	autumn & spring	high
5a	Depth of piezometer	once	high
5b	Depth to watertable	x 4/year (monthly)	high (moderate)
6	Salinity (ECw) of groundwater	autumn & spring	high
7	Soil texture changes over the upper 50 cm of soil profile	once	high

8	Soil pH changes over upper 50 cm of soil profile	once	moderate
9	Presence of cemented pans in soil profile	once	moderate

## 5. TREATMENTS:

Treatments are based around soil type and the severity of salinity. An EM salinity survey helped to decide the boundaries for each treatment.

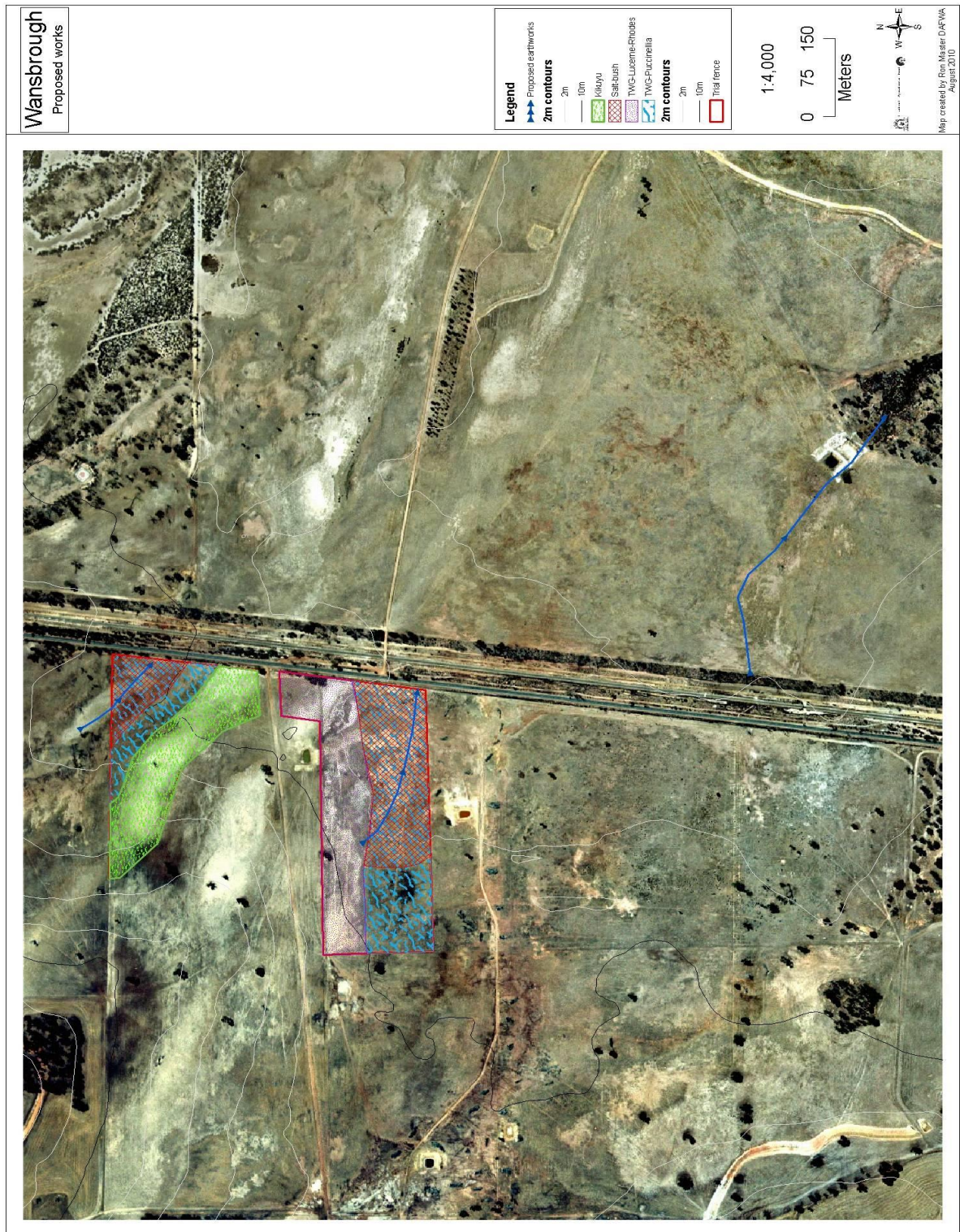
- 1) Kikuyu on the deep sand dune area (fresh)
- 2) Saltbush dense stand (severe)
- 3) Tall Wheatgrass, Lucerne and Rhodes Grass (moderate – mild)
- 4) Tall Wheatgrass and Puccinellia (moderate – severe)



Discussing treatments and planning the demonstration site prior to works being undertaken involved the Gillamii Centre, Dept of Agriculture & Food, Main Roads WA and the Landholder Tom Irving.



## 6. SITE PLAN/MAP:



## 7. RESULTS & DISCUSSION:

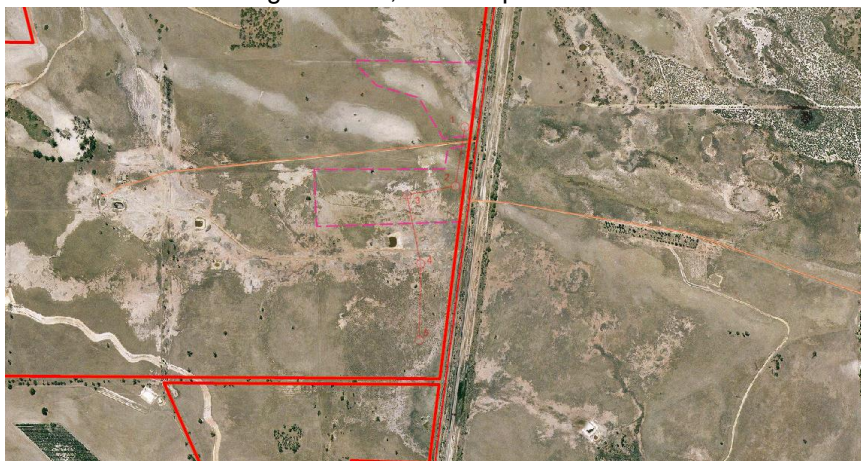
### a. Establishment Methods

- Due to extremely poor season, original timeline of implementation of perennials during spring 2010 has been deferred to following year.
- Guilford grass present on site, this extra time has allowed more effective spraying program to eradicate.

### b. Soil Samples:

Soil samples were taken in May to a depth of 50cm and are as follows:

- 1 On sandy ridge, north side of driveway near white gate (possibly kikuyu area)
- 2 On thick grass area, south of point 1
- 3 Up near large dam on patchy barley grass, SW of point 2
- 4 On bare scald
- 5 Amongst rushes, north of piezometers



Code	Depth	Texture	Conductivity dS/m	pH Level (CaCl2)	pH Level (H2O)	Nitrate Nitrogen mg/kg	Ammonium Nitrogen mg/kg	Organic Carbon %
1A	0-10	1.5	0.040	5.20	5.90	2	6	0.73
1B	20-30		0.019	5.20	6.00			
1C	40-50		0.019	5.20	6.10			
2A	0-10	1.5	0.270	5.50	6.10	9	8	1.79
2B	20-30		0.097	6.50	7.40			
2C	40-50		0.415	7.60	8.60			
3A	0-10	2.0	4.080	6.00	6.50	11	12	2.39
3B	20-30		1.331	7.00	7.90			
3C	40-50		1.178	7.70	8.60			
4A	0-10	1.5	7.810	6.70	7.00	7	5	1.77
4B	20-30		4.150	7.60	8.20			
4C	40-50		3.050	7.90	8.50			



5A	0-10	1.5	3.200	5.70	6.30	2	6	0.93
5B	20-30		1.449	7.10	7.90			
5C	40-50		0.916	8.20	9.00			

**c. Germination results/seedling survival:**

This project will not be sown until 2011, as such at this time there is no reportable information on success rate of seeding.

**d. Grazing:**

Due to deferring the sowing of this project due to poor season and weed conditions, there is not likely to be any grazing activity on this site for some time yet.

**e. Bore Readings**

Two bores were drilled down to 5m to monitor water level fluctuations over the life of the demonstration. One bore was located in the proposed TWG, Lucerne and Rhodes Grass treatment while the other was located in the proposed dense Saltbush treatment.

Initial information from the bores on 12/8/2010 are shown below.

Bore ID	Water level (m)	Salinity (mS/m)	pH	Comments
WAM1i10 Lucerne, TWG, Rhodes grass	-1.05	249	6.56	Fresh water
WAM2i10 Dense saltbush	-0.6	2380	7.11	One third sea water

**f. EM Survey**

An electromagnetic survey was carried out by Paperbark Consultants using an EM38 and EM31 to determine the spatial context of soil salinity throughout the demonstration site. The EM38 measures salinity from 0 to 1m depth while the EM31 measures from 0 to 6m depth. Knowing the soil salinity for these two ranges helps gain insight as to whether the area is still growing or has reached its equilibrium.

Please see attached file – EM Survey Results.

**8. FUTURE PLANS:**

- a) Take photos at photo points (every 6 months)
- b) Measure water levels (every month initially for 2 years, then twice a year)
- c) Record grazing dates and animal type
- d) Possible future EM survey in 5 years (depending on funds) to monitor any changes in soil salinity since treatment
- e) Visually monitor the establishment of treatments (plant cover) and assess the effect of grazing on persistence.

**9. PHOTOS:**

Photo monitoring sites established. These to be updated every 6 months.

Please see attached file – Wansbrough Photo Point Record

**10. ACKNOWLEDGEMENTS:**

Department of Agriculture & Food: Arjen Ryder – Hydrologist  
Ron Master – Technical Officer  
Justin Hardy – Senior Development Officer  
John Paul Collins – Technical Officer  
Ed Barrett-Lennard – Ecohydrology

**11. REFERENCES:**

- a) Saltland Genie at [www.saltlandgenie.org.au](http://www.saltlandgenie.org.au)
- b) SaltCAP